

Unemployment and Representation: How Legislative Support for Free Trade Responds to Trade Shocks*

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Abstract

This paper examines the impact of trade shocks on the Congressional support for free trade legislation between 1996 and 2012. It tests the heterogeneous effects of the trade shocks on different types of legislation, as well as differences by election year and electoral competitiveness, to highlight the accountability mechanism by which the relationship manifests. I use a novel new measure of trade's deleterious effects that affords causal identification on how trade policy responds to trade shocks. I find that 1,000 trade-related layoffs lead to six fewer votes in favor of free trade legislation in the year following the layoffs. This effect is stronger during election years and in contested Congressional Districts, suggesting that the relationship I document travels via voters. However, interacting interest group campaign contributions with trade-related layoffs dramatically reduces Representative responsiveness. I argue that my results identify the micro-foundations of electoral accountability via a voter mechanism, and provide suggestive evidence of how interest groups undermine representative democracy.

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I. INTRODUCTION

The normative appeal of US democracy hinges on its ability to achieve policy outcomes that reflect public preferences. In theory, re-election incentivizes politicians to pursue policies in line with the desires of their constituents. Voters hold elected representatives accountable by punishing those who stray too far from the median voter's ideal point.

Empirical support for this claim is complicated by the realities of preference aggregation. The ability of subsets of voters to overcome the barriers to collective action is crucial to understanding how public opinion interacts with public policy. In this paper, I characterize the relative strength of these competing mechanisms by analyzing a policy area particularly well-suited to the question at hand: trade.

Trade is a useful policy area for study because the winners and losers face different barriers to collective action. I analyze the impact of trade-related layoffs on legislative behavior to characterize the influence of constituent preferences on policy. I find that members of Congress support protectionist policies following trade-related layoffs in their District. This relationship is substantively weak, with none but the most contentious of bills being affected by the magnitude of the coefficient. However, looking at the difference in the effect between Districts with little interest group presence and those with a high level of interest group activity yields a much more powerful relationship. I argue that these findings constitute causally-identified evidence of the diffuse voter mechanism and highlight a fruitful area for future research on interest groups.

This paper contributes to the literature on representation in the US by characterizing the relative influence of disaggregated voters and organized interests on trade policy. I argue that trade policy is a useful place to start looking at the competing effects of diffuse and organized interests and that my results can speak to representation in the United States, at least in policy areas where similar incentives for organizing exist. In addition, my findings also speak to the IPE literature by providing well-identified evidence of how voters respond to trade shocks.

In the sections that follow, I describe the theorized pathways of interest, highlighting the hypotheses that I bring to the data. Then I describe the data in detail and defend my causal claim. The primary results are presented in section IV with robustness and placebo checks summarized in section V. Section VI concludes.

II. CONTRIBUTION

Can voters compete with organized interests in influencing policy outcomes? A satisfying answer to this question should chart the micro-foundations of the relationship between voters, interest groups, and policy. In this paper, I present evidence of the voter mechanism by controlling for interest group influence. I then run an interacted specification to document how policy responsiveness changes when interest groups have a strong presence in Congressional elections. I leave a detailed analysis of the interest group mechanism to future research.

The theorized voter mechanism consists of two steps. First, voters must be able to connect an external shock to some policy in such a way that their preferences shift. In my context, this shock is the loss of a job due to trade. Second, politicians must respond to these changed preferences in a policy-relevant manner. I measure legislative effort with both voting records on trade policy as well as with speech analysis on how Congresspeople talk about trade bills. Figure 1 visualizes the theorized mechanism (the voter mechanism travels via the upper path) along with competing mechanisms (the interest group mechanism travels via the lower path).

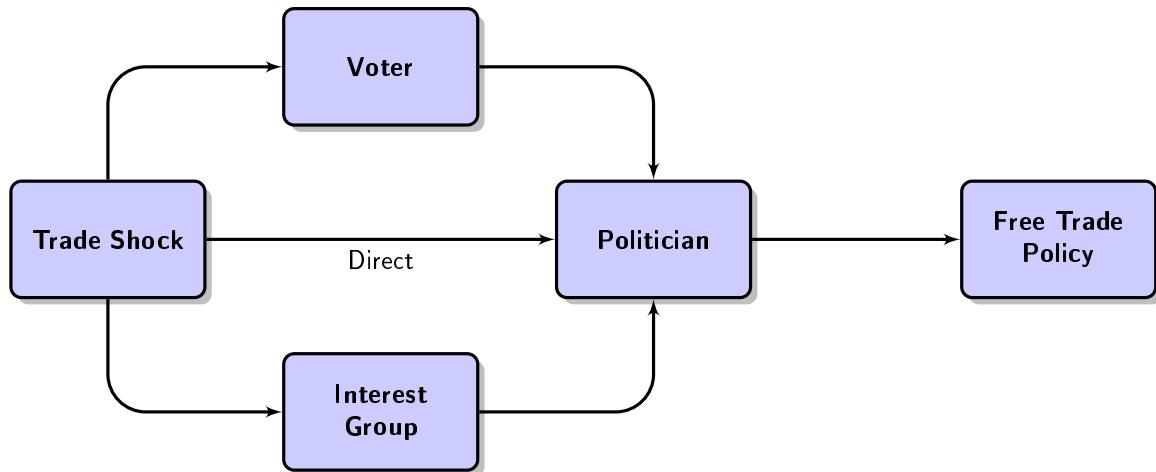


Figure 1: The causal path from trade shocks to legislative behavior.

The first link from external shocks to policy preferences has been the focus of research on public opinion. Well-identified contributions typically uses either surveys, in which the treatment of interest can be randomized by construction (Gerber and Green [23], Gerber et al. [24]), or creative measures of plausibly exogenous shocks that occur naturally (Egan and Mullin [19], Meredith [39], Erikson and Stoker [20]). These efforts have found evidence of policy preferences

responding to external shocks although the effects are usually fleeting.

The existing papers that examine the second step in the causal chain use exogenous variation in institutional determinants of representation. Alt et al. [6] examine the effect of changes in gubernatorial term limits on “effort”, disentangling the separate channels of accountability and competence. Gordon and Huber [26] similarly exploit variation in elected and appointed judges in Kansas to examine how electoral accountability changes judicial decisions.

These twin branches of the literature make excellent contributions toward unpacking the micro-foundations of representation by focusing solely on the first and second steps of the pathway presented in Figure 1. However, they are unable to (1) document the causal mechanism from policy preferences to policy outcomes holistically and (2) speak to the competing influences of diffuse constituents and organized interests.

There have been many attempts to connect preferences directly to policy, dating back to the 1970s. Public opinion research has traditionally relied on reduced-form correlations between state and District-level ideology and policy outcomes (for a review, see Burstein [13]). Analyses of trade policy specifically have regressed trade policy outcomes on constituent demographics theorized to influence preferences in some way (for recent contributions, see Milner and Tingley [40, 41] and Kono [33]). However, these efforts are vulnerable to accusations of reverse causality and omitted confounders. For example, do politicians from high skill Districts vote in favor of free trade because their constituents want them to? Or do high skill voters move to Districts represented by a pro-free trade politician?

This paper provides causally-identified evidence of US House Representatives behaving in a more protectionist manner in response to a shock to their District’s trade policy preferences. I argue that my specification isolates the accountability channel that connects political behavior to constituent preferences, providing a micro-founded account of the voter mechanism. I then include my interest group controls as interaction terms to document the augmented effect when organized interests are allowed to influence the relationship between trade shocks and trade policy. I find significant interaction effects in Districts with active interest group influence but not among individual politicians, supporting the theory that campaign contributions buy access, not policy (see Kroszner and Stratmann [34], Grimmer and Powell [29], and Fouirnaies and Hall [21]). In the following section, I describe my data and defend my identification strategy.

III. DATA AND METHODS

III.i Policy Area

I test the responsiveness of House Representatives to changes in the preferences of their constituents using data on trade. Trade is a useful policy area for several reasons. First, trade policy produces winners and losers with different concentrations of benefits and costs. This variation helps me measure policy responses that can speak to both the voter mechanism described above as well as the competing influences of diffuse and organized interests.

Second, trade policy is a salient and easily understood area with clear positions representing the preferences of winners and losers. Producers in import-competing firms are hurt by free trade while producers in exporting firms and consumers benefit from free trade. In addition, consumers enjoy the increased purchasing power afforded by free trade, although these benefits are so diffuse that voters would need to be very sophisticated to connect their savings with trade policy.

Third, the economic effects of trade have spill-overs beyond the individual. A firm that lays-off 2,000 workers may only directly affect a small fraction of the population in a Congressional District. However, the social costs are much broader, reflected in housing prices (Scheve and Slaughter [45]), crime (Bisbee [11]), and interpersonal connections (McPherson et al. [38]). For the purposes of my analysis, I combine the ego-tropic preference changes (i.e., the specific individuals who are laid off) with the socio-tropic (i.e., family and friends who are affected, local economy degradation) to claim that trade-related layoffs affecting 1% of a District warrant a legislative response.

Finally, trade legislation occurs with enough regularity that an incumbent politician faces an average of 8 trade-related votes per year over the period I study. This voting record can be touted in re-election campaigns by either the incumbent or the challenger. Furthermore, trade policy is relatively bipartisan with Congressional votes that deviate from pure party-lines, giving me ample variation in my dependent variable that cannot be explained with simple party dummies. Taken together, these characteristics of trade and trade legislation make it a particularly fruitful issue area to test the micro-foundations of representation in US democracy.

III.ii Data

My unit of analysis is the Congressional District-year from 1996 to 2012. I collect data on a variety of factors at both the level of individual politicians (demographic covariates, ideology, campaign receipts) as well as at the Congressional District level (demographic covariates, local transfers, industry composition, economic outcomes). In the following sections, I describe my dependent and independent variables in more detail.

III.ii-a Dependent Variables

My main dependent variable is how House Representatives vote on trade policy. To identify relevant roll call votes, I use descriptions provided by the CATO Institute [3]. These descriptions include information on (1) the free trade position implied by a “Yea” vote and (2) whether the legislation under consideration is related to subsidies for domestic producers or barriers to imports. I convert each Representative’s vote into either pro- (coded as 1) or anti-free trade (coded as 0) and then take the average number of free trade bills the Representative supports in a calendar year.

In most observations, the annual measures of free trade support by Representative map one-to-one into Congressional Districts. Where they don’t (due to death, resignation, or retirement), I take the annual average by Congressional District. Instances in which a District experiences a change in Representative are rare, averaging roughly 5 Districts per Congress. I account for these Districts in my robustness checks.

Some of the bills deal with a combination of trade-policy and another issue, commonly national security. I create a separate measure of free trade support that weights the measure described above by trade saliency. For example, bills on the Cuban embargo receive a lower weight than those dealing with free trade agreements. My results are robust to both the raw and saliency-weighted measures. A full list of the bills can be found in the appendix. Summary statistics of the bills are presented in Table 1.

Table 1: Bill Summary

<i>“Aye” Vote Implication</i>	Subsidies	Barriers	Total
Enact/Maintain	14	24	38
Remove	17	42	59
Total	31	66	97

Voting on bills in the halls of Congress is a strategic decision in which Representatives bargain over legislation in order to maximize their re-election and policy incentives. There is abundant evidence of party whips allowing deviations in partisan voting if the policy outcome is assured and if the Representative can gain electorally for their deviation (see Ansolabehere et al. [7], Poole and Rosenthal [42]). Insofar as I'm interested in measuring the responsiveness of legislative effort to changes in voter preferences, these strategic behaviors do not detract from my results.

Nevertheless, I also look at how Representatives talk about trade legislation when speaking on the floor of Congress. Speeches are less constrained by the party lines and serve as an alternative measure of politician effort that is relevant to the discussion of representation. I gather data on all trade-related speeches using Sunlight Labs' CapitolWords API [1]. I identify trade-related speeches using the topic codes assembled by the Policy Agenda Project [10]. Over the period of study, there are 1,553 speeches given by 404 Representatives. A detailed description of the speech data is presented in the Appendix.

III.ii-b Treatment Variable

The majority of the existing research on trade uses measures of import penetration in which the share of an area's population employed in an import-competing industry is combined with the total amount of imports in related goods. These measures are useful for research that focuses on how individuals adjust to economic shocks. In this context, import penetration measures are plausibly exogenous sources of variation in economic outcomes since, properly constructed, they capture only changes in foreign productivity. Furthermore, endogeneity concerns typical to the cross-country research (i.e., whether the country is a price-taker) are mitigated at smaller geographical units of analysis such as the Congressional District or US county.

However, for my research, an import penetration measure is inappropriate as a source of exogenous variation in individual trade policy preferences. The reason is that voters and politicians alike can anticipate these types of shocks, muddying my causal claim. I need a measure that, even if anticipated, shocks voter preferences discontinuously. I argue that trade-related layoffs constitute the necessary shock for my causal claim. While the ego-tropic loss of a job may be foreseen, I argue that socio-tropic layoffs alter trade preferences at the District level that require a policy response from a re-election seeking Representative.

I use applications submitted to The Trade Adjustment Assistance (TAA) branch of the Department of Labor to measure the number of trade-related layoffs. The TAA is a government program that provides additional income smoothing assistance to workers who lose their jobs due to trade. In order to receive benefits such as extended unemployment insurance and job training, claimants must demonstrate that the layoff was due to trade. Applications can be submitted by either groups of 3 or more workers, by the firm who laid off the worker, or by unions and other authorized officials. The Department of Labor vets each claim via interviews, requests for financial data, and careful examination of the presented evidence.

This measure is a superior alternative to import penetration measures for three reasons. First, this measure captures the worst economic outcomes associated with trade and one that voters will surely notice. Second, it overcomes any concern that voters might not connect their plight with trade policy specifically. These applications measure the layoffs that the affected workers *recognize* are associated with trade and express interest in receiving government support. Finally, these applications overcome the ongoing debate in the trade literature about whether trade's winners and losers cleave to industry (as predicted by the Ricardo-Viner model [30]) or factor (as predicted by the Stolper Samuelson theory [46]) divisions.

It bears emphasizing that my causal claim hinges on two characteristics of the TAA measure. First, trade-related layoffs overcome concerns with either voters or Representatives being able to anticipate trade's negative effects. For the voter, public opinion research has shown that the loss of a job affects policy preferences with effects an order of magnitude stronger than other shocks (Margalit [35]), meaning that the effect I document differs discontinuously from prior trade-related hardships. For the politician, trade-related layoffs require a response in order to guard against challenger attacks in the following election cycle. Even if her legislative efforts do not alter national policy, the politician can highlight her roll call votes and her speeches on the floor of the House in her re-election campaign. Ample evidence finds that US Congresspeople campaign in precisely this manner: citing legislative effort in order to win re-election (Franklin [22], Mayhew [36], Kingdon [32], Arnold [8]).

Second, TAA applications cannot have a direct effect on policy responses except through the impact of the unemployment they measure. Constituents do not file for support from the TAA in order to change policy and, in theory, the TAA does not adjust their certification process based on

the District of the claim. My results are robust to using either the total number of applications filed or restricting my analysis to only those that were certified by the TAA.

It also bears noting that TAA applications constitute a lower-bound measure of trade-affected Districts if we assume that there may be other workers who were laid off due to trade but for whatever reason decided not to apply for additional support. As illustrated in Figure 2, the TAA measure has good coverage over both geography and time, with 100% of Congressional Districts having applications filed and every year seeing at least 90% of the Districts filing. Figure 2 also highlights the industry-specificity of the TAA data. Unfortunately (although unsurprisingly), the vast majority of applications are from manufacturing firms, limiting the power of industry-specific results. A full description of the data is presented in the Appendix.

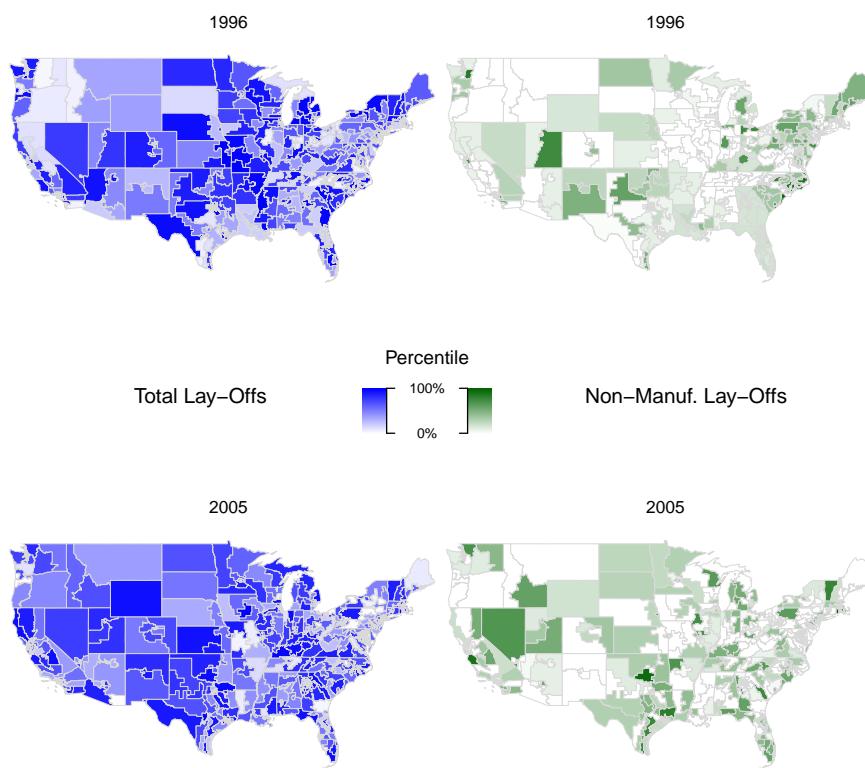


Figure 2: Trade-related layoffs as a share of total District population in manufacturing and net in 1996 and 2005. Color intensity indicates the location of claims in each District by percentile for overall trade-related layoffs for the year.

III.ii-c Controls

I control for a variety of political and demographic factors associated with the individual politicians. These include party identification, the candidate's ideology (based on campaign finance scores [12]), total campaign contributions (logged), gender, religion, race, previous occupation prior to holding office, and age.

I also include a number of District-level time varying controls. These include measures of the share of the work force that is high skill, District-level campaign contributions, the unemployment rate, the share of the District that migrated from a different county, the labor force participation rate, District ideology, presidential vote share, and a variety of local transfers. Descriptive statistics for a selection of these variables are presented in Table 2.

Table 2: Summary Statistics

Dependent and Treatment Variables	<i>District Level</i>	<i>Representative Level</i>
Free-trade Support	0.517 (0.314)	0.538 (0.309)
Anti-Subsidy Support	0.335 (0.402)	0.337 (0.391)
Anti-Barrier Support	0.56 (0.348)	0.564 (0.309)
Total TAA	508.08 (746.18)	-
Certified TAA	368.85 (597.795)	-
Incumbent Voteshare	- -	69.32 (12.88)
Controls		
CF Ideology ^a	0.0032 (0.998)	0.0993 (0.777)
Military Service ^b	0.0052 (0.0113)	0.2594 (0.438)
% Agriculture ^c	0.0094 (0.010)	0.0413 (0.199)
Total Contributions	\$1,290,567 (\$1,404,526)	\$742,721 (\$769,811)
Labor Contributions	\$89,447 (\$81,408)	\$61,032 (\$76,380)
Corporate Contributions	\$130,115 (\$112,209)	\$113,474 (\$112,839)
Unemployment Insurance	\$104,347 (\$90,813)	- -

Notes: ^a Campaign finance (CF) ideology scores calculated from contributions by interest groups and individuals. ^b Military service data for Districts drawn from Census. Data on Representatives drawn from GovTrack [4]. ^c Representative employment based on previous occupation as recorded by GovTrack.

III.iii Methods

In the following section, I describe my specification and defend my identification strategy.

III.iii-a Specification

I regress free trade support on the share of the District population that was laid-off for trade-related reasons in the previous year, controlling for competing mechanisms and omitted variables via candidate and District-level controls as well as District and year fixed effects and state time trends. My main results use the raw measure of free trade support and the total estimated number of laid-off workers documented in TAA filings. In my robustness checks, I re-run the regression using the salience-weighted measure of free trade support regressed on the total number of laid off workers certified by the Department of Labor, measured as the share of the total population as well as the share of the labor force. My empirical specification is presented in equation 1

$$FT_{d,t} = \alpha + \beta_1 T_{d,t-1} + \beta_K C_{i,t} + \beta_L D_{d,t-1} + \gamma_t + \lambda_d + \delta + \epsilon \quad (1)$$

where FT represents my measure of free trade support, T represents the number of workers laid-off, C is a K -length vector of candidate controls, and D is an L -length vector of District controls. Subscript d identifies the Congressional District, subscript i identifies the Congressional Representative, and subscript t identifies the calendar year. I include all time-varying District-level controls as lagged measures in order to avoid post-treatment bias.

III.iii-b Identification

In order to claim a causal relationship between a trade shock and voting behavior, I refer to Figure 3 (which reproduces Figure 1 with the pathway of interest represented in dark arrows and confounds indicated with dashed arrows). My claim rests on the assumption that, controlling for competing channels, my measure of trade-related layoffs affects policy outcomes exclusively through the theorized channel of the voter. This assumption can be violated via reverse-causality, omitted confounds, or improper use of available controls.

The primary concern when examining policy outcomes is reverse causality. I exploit the panel nature of my data to measure the impact of trade-related layoffs on lagged legislative effort. It

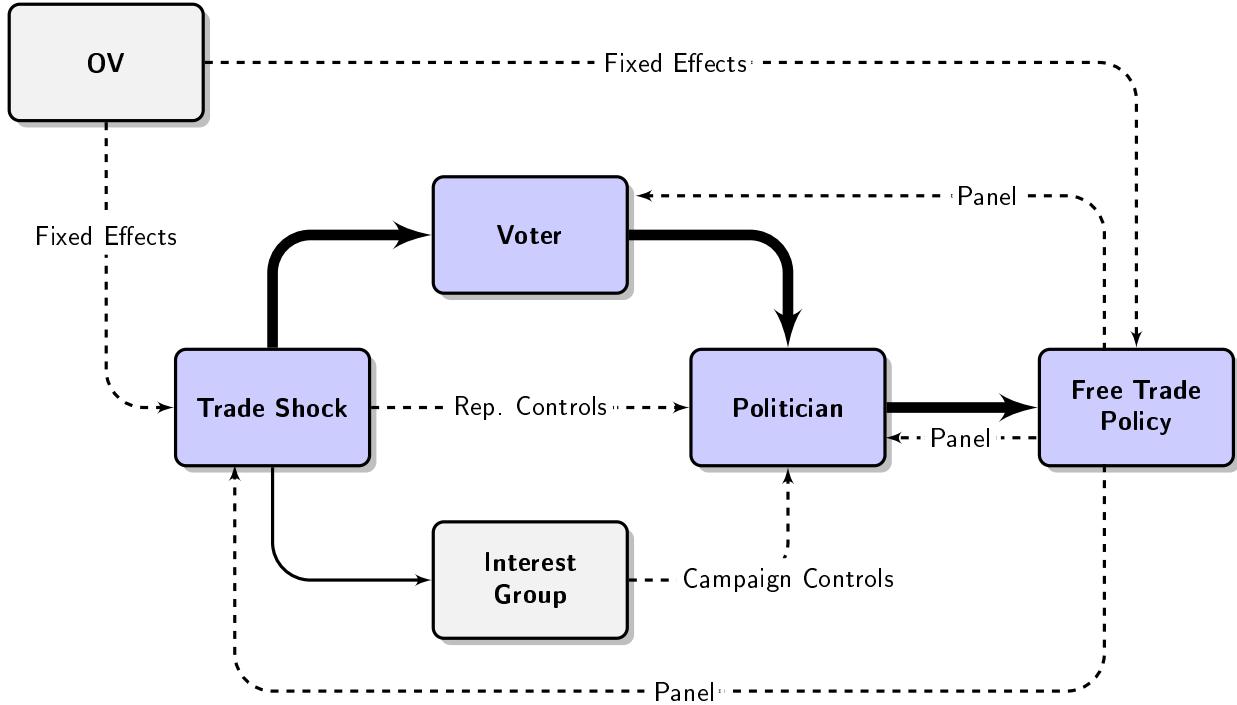


Figure 3: Identification strategy. Dashed lines represent potential confounders that I control for exploiting different aspects of my data. I argue my strategy recovers only the causal path highlighted with dark arrows.

bears emphasizing that the most plausible relationship between free trade policy and trade-related layoffs is *positive*. Free trade legislation would be expected to create trade-related layoffs which work against the theorized *negative* relationship of politicians responding to trade by voting in a more protectionist manner, making my analysis conservative. Nevertheless, I demonstrate the validity of my specification with placebo checks that examine the relationship of policy on future trade-related layoffs.

There is also a risk that the relationship I document is not solely the product of the voter pathway specified. Trade shocks can influence policy outcomes via their effects on both the interest groups as well as the direct effect on the politician. I control for interest group behavior by including measures of campaign contributions to the politician and the overall amount of contributions in the District. I control for the direct effect on the politician by controlling for politician ideology, party affiliation, and profession, as well as core demographic measures. I contend that these controls partial out the two competing channels, leaving only the voter pathway.

An omitted variable that affects both the trade shock and the policy outcome remains a concern although the risk is greatly reduced by the inclusion of District and year fixed effects

as well as state trends. A threat to causal identification would therefore have to be a factor that varies by politician over time and across Districts that both reduces support for free trade and leads to increases in TAA applications. A candidate variable could be the strategic behavior of a politician who promotes the use of TAA among her constituents in order to justify more protectionist policies in the following year. In the robustness checks, I include a sensitivity analysis to characterize the threat of OVB to my causal claim.

In sum, I contend that my treatment measure constitutes a plausibly exogenous shock to the Congressional District that will affect legislative behavior. The experience of losing one's employment, while not impossible to anticipate by individual voters, represents a socio-tropic shock to trade-policy preferences. Furthermore, the ability of voters and politicians to anticipate the shock would only attenuate my results. I argue that my use of politician-controls and interest group campaign contributions accounts for the competing channels visualized in Figure 3. In addition, the use of District and year fixed effects, as well as state time trends protects against unobserved variables that may render my causal relationship spurious. Finally, I exploit the panel nature of my data to protect against reverse causality.

IV. ANALYSIS

I present my main findings that characterize the impact of trade-related unemployment shocks on legislative support for free trade. I supplement this analysis with alternative measures of politician responsiveness, using text analysis to highlight the systematic differences in politician speeches between low- and high-shocked Districts. Taken together, these results suggest that trade shocks affect politician behavior, both in terms of how they talk as well as how they vote.

I then turn to examining the heterogeneous effects of this relationship to support my claim that my findings describe the voter pathway. Specifically, I look at heterogeneous effects by legislation type, electoral competitiveness, and election year. I also measure the incumbent vote share as a function of trade-related layoffs to determine whether voters punish politicians.

Finally, I include interest group campaign contributions as an interaction term instead of using them as a control. This specification allows me to characterize the difference in Representative responsiveness to trade shocks between Districts with a minimal amount of interest group influence

and Districts in which interest groups are active. These results identify a voter mechanism for trade policy that varies by interest group influence.

IV.i Main Results

I find that standard deviation increase in trade-related layoffs causes a decline in free-trade support by 0.04 standard deviations. This effect is significant at the 95% level of confidence but is substantively mild, reducing free-trade support by 2% in the year following 1,000 layoffs. This result is equivalent to roughly 6 Representatives changing their vote on a particular piece of legislation. While the bills under consideration are mostly tight votes, only 5 are close enough to be affected by a two standard deviation increase in the number of workers laid-off.

Table 3: Free Trade Support and Import Penetration Shocks

	(1) Biv	(2) Cand	(3) Dist	(4) FE	(5) Full
Total Laid-Off	.01 (.02)	.01 (.02)	-.00 (.01)	-.03** (.01)	-.04** (.02)
Independent		-.10 (.12)	-.17 (.11)		.35 (.58)
Republican		.27*** (.08)	.10 (.07)		-.01 (.07)
Candidate Ideology		.05 (.06)	.18*** (.05)		-.00 (.05)
District Ideology			-.05 (.04)		.09 (.06)
District President Voteshare				-.77*** (.27)	1.25** (.62)
% High Skill				2.85*** (.71)	4.38** (1.90)
District Fe	No	No	No	Yes	Yes
Year FE	No	No	No	Yes	Yes
State Trends	No	No	No	No	Yes
N	3463	3430	3399	3463	3399

Notes: Columns 1-3 are estimated using a simple bivariate specification, including candidate covariate controls, and including District-level controls. Column 4 includes District and year fixed effects while column 5 adds state-specific time trends as well as candidate-level controls. * p<0.10, ** p<0.05, *** p<0.01.

Conceptually, this relationship characterizes the entirety of the causal diagram referenced in Figure 3 and likely conservative for the following reasons. First, the treatment variable represents

the worst possible outcome for a voter working in an import-competing industry. It is likely that similarly exposed voters who are not laid off are nevertheless influenced, making the difference between treatment and control groups narrower than they would otherwise be under a truly random assignment. Second, the Representative's decision to support free trade or protectionist policy is doubtlessly influenced by other strategic considerations within the halls of Congress. If legislative effort is interesting only insofar as it captures representativeness, roll call votes are a noisy measure, further reducing the magnitude of the effect due to attenuation. In the following section, I present an alternative analysis that uses Congressional speeches to identify a different measure of legislative effort.

IV.i-a Speech Analysis

To analyze rhetoric as an alternative measure of legislative effort, I expand the number of bills by looking for any trade-related legislation (identified using the Policy Agendas Project [9]) that Representatives discuss. For each bill under examination, I gather all related speeches using the Sunlight Labs' CapitolWords API [1]. I then used Structural Topic Modeling (Roberts et al. [43, 44]) to model the topics associated with each speech. The method improves on traditional topic modeling (i.e., Latent Dirichlet Allocation) by allowing the researcher to include covariate data in the creation of the topics. Specifically, I used a dummed measure of trade-related layoffs (in which Districts in the 25th quartile were coded zero while those in the 75th quartile were coded 1) as my treatment measure and controlled for date, location, and available covariates semi-parametrically.

It bears emphasizing that this analysis only uses speeches related to trade bills. As such, the topics presented are not illustrative of the overall rhetoric used by Representatives. Rather, they reflect the way in which the Representatives talk about *trade-related legislation only*. Future research could augment this analysis by also looking at how incumbents and challengers talk about trade on the campaign trail following trade-related layoffs.

The primary results are summarized in Figure 4. I find marginally significant differences in the topics Representatives emphasize in floor speeches conditional on whether they are from a District in the top quartile of TAA submissions. Specifically, politicians from relatively unaffected Districts are more likely to talk about the role of the United States as a global superpower ("Global

Leadership”), and the benefits of free trade (“Free Trade”) relative to politicians from unaffected Districts. Conversely, Representatives from Districts in the top quartile of the trade shock measure are more likely to discuss the steel industry in the United States (“US Steel”), the importance of creating new jobs (“Job Creation”), and tend to emphasize relatively protectionist topics (“Fair Trade” and “Trade Deficit”) relative to their peers in the top quartile of affected Districts.

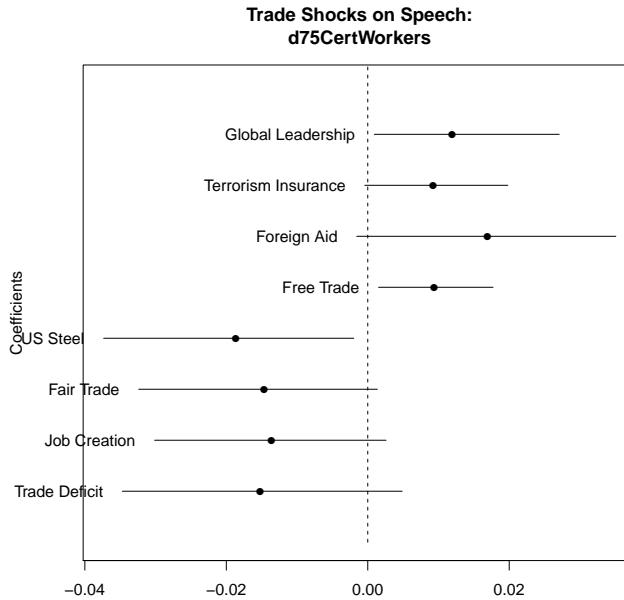


Figure 4: Speech topics as a function of being in the top (left on the x-axis) or bottom quartile (right on the x-axis) of TAA applications. 95% confidence intervals presented with bars.

These results align with the roll call voting results discussed above. Assuming that floor speeches constitute a different but related measure of legislative effort, the speech analysis suggests that politicians from negatively affected Districts respond to trade-related layoffs by altering the way they talk about trade policy. The comparison between speeches emphasizing “fair” trade versus those emphasizing “free” trade is particularly illustrative, as these terms are common buzzwords associated with each side of the free trade debate. A detailed validation of the topics I assign to the word collocations is presented in the Appendix.

IV.ii Heterogeneous Effects

The analysis above demonstrates a negative relationship between trade shocks and politician support for free trade, be it measured using roll-call votes or text analysis. In the following section, I present supporting evidence of the relationship capturing the voter mechanism. Specifically, I

first look at the heterogeneous effects by policy type (subsidies versus barriers). Assuming that subsidies are more politically salient than other forms of protectionism, I expect to see a stronger relationship when focusing on this type of bill. Second, I look at whether the effects are stronger in reelection years and in closer Congressional races. Again, the assumption is that politicians in close races are more likely to respond to trade shocks. Finally, I measure the change in incumbent vote-share in response to trade-related layoffs when the incumbent is pro- or anti-free trade.

IV.ii-a Bill Type

Public opinion research agrees that a policy must be easily understood for the voter's preferences to change. Some protectionist policies rely on complicated regulatory procedures to restrict the flow of imports while others directly support local producers with subsidies. Assuming that the latter is more easily communicated to, and understood by, the voter, it follows that the effect of trade-related layoffs would be stronger for subsidies than other types of legislation. Table 4 summarizes the main findings, supporting the salience of subsidies versus barriers.

Table 4: Free Trade Support and Import Penetration Shocks

	(1) Biv	(2) Cand	(3) Dist	(4) FE	(5) Full
Barrier Legislation					
Total Laid-Off	.02 (.02) [3116]	.02 (.02) [3084]	.02 (.02) [3053]	-.03* (.01) [3116]	-.03** (.02) [3053]
Subsidy Legislation					
Total Laid-Off	-.02 (.02) [1848]	-.04** (.02) [1829]	-.06*** (.02) [1817]	-.04** (.02) [1848]	-.06*** (.02) [1817]
District Fe	No	No	No	Yes	Yes
Year FE	No	No	No	Yes	Yes
State Trends	No	No	No	No	Yes

Notes: Columns 1-3 presented the results estimated using a simple bivariate specification, including candidate covariate controls, and including District-level controls. Column 4 includes District and year fixed effects while column 5 adds state-specific time trends as well as candidate-level controls. The top panel summarizes the results for legislation designed to remove barriers to trade (such as tariffs and non-tariff barriers) while the bottom panel describes the results for anti-subsidy legislation. Total observations are presented in brackets and standard errors clustered at the District level are presented in parentheses. * p<0.10, ** p<0.05, *** p<0.01.

IV.ii-b Re-election Incentives

If politicians are conditioning their legislative effort on the preferences of their constituents, one might reasonably expect to see a stronger effect on legislative behavior during reelection years. This is based on the assumption that voters pay closer attention to Representative behavior when they vote. Similarly, we would also expect an accountability mechanism to be stronger in contested Districts and weaker for incumbents who won their seat in a landslide. Figure 5 presents the findings for an interacted specification of legislative support for free trade regressed on trade shocks in election years and non-election years, as well as in competitive Districts whose previous Congressional election was decided by a vote margin less than 10%.

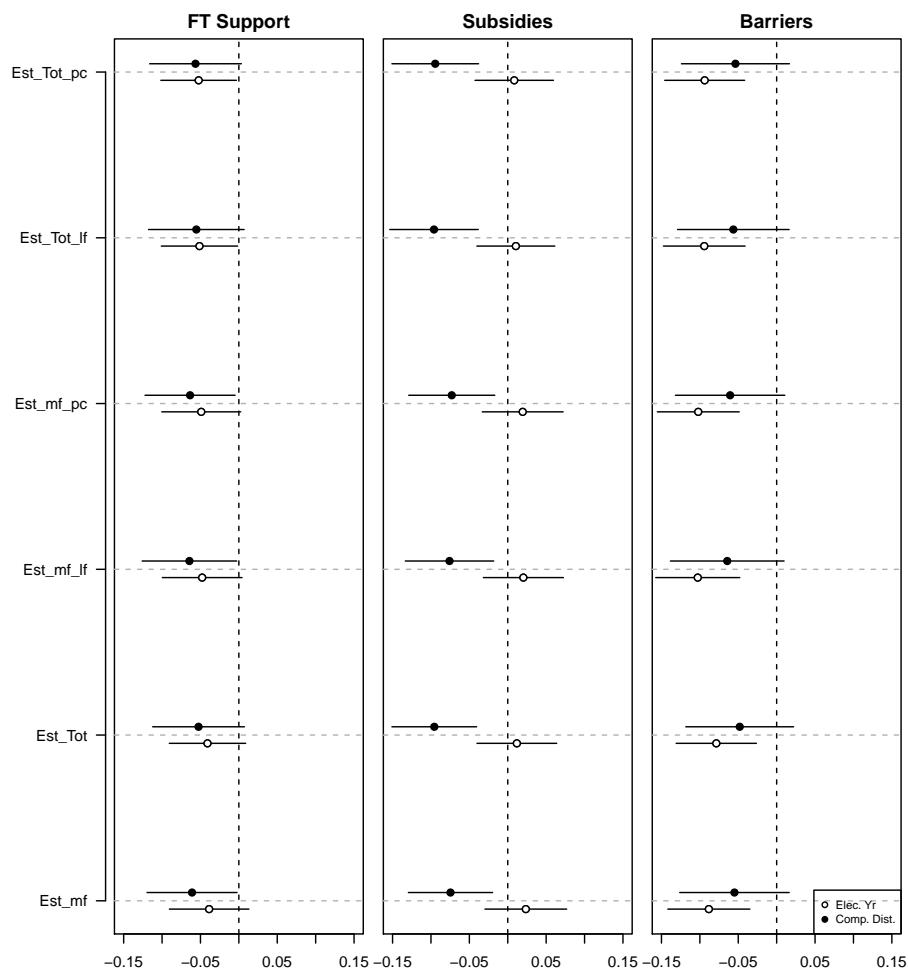


Figure 5: Interaction effects for different types of legislation, in election years and competitive Districts. Interaction coefficients presented on the x-axis. Different measures of trade-related layoffs presented on the y-axis, including total layoffs, the share of the District population (pc), and the share of the District labor force (lf).

The results largely support the voter mechanism by illustrating stronger protectionist behavior among politicians in election years as well as among those serving in a contested District. Interestingly, these results are stronger for the competitive Districts than for election years, particularly when restricting analysis to subsidies. Figure 6 presents the marginal effects of these interactions, illustrating that the negative relationship between trade-related layoffs and free trade support only exists during election years and in competitive Districts. Importantly, the relationship between legislative support and layoffs is null when the electoral accountability mechanism is reduced, supporting the claim that my results represent the voter pathway.

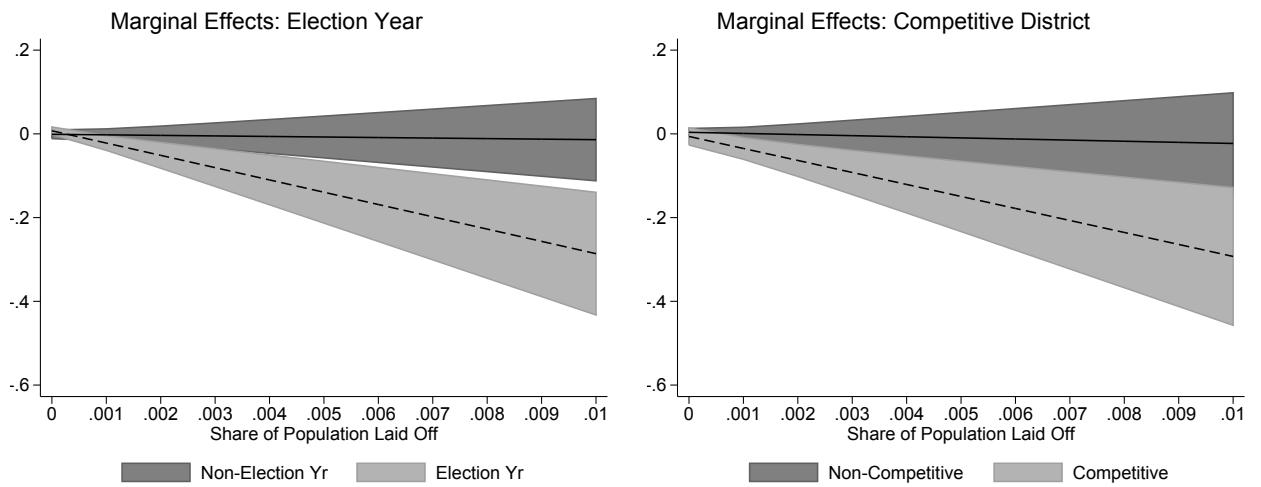


Figure 6: Marginal effects of trade-related layoffs (measured in per capita terms on the *x*-axis) interacted with election years (left) and competitive districts (right). The *y*-axis indicates the marginal effects of the interaction over the range of layoffs. These results hold for alternative measures of the treatment variable, including the share of the District labor force, as well as for the raw number of laid-off workers.

IV.ii-c Electoral Punishments

Assuming that the results presented above truly isolate the voter mechanism that links trade shocks to legislative effort, we should also see evidence of voters rewarding responsive incumbents and punishing those who fail to reflect their interests. To test this, I regress incumbent vote-share in the following election cycle on the two-year average of trade-related layoffs and free-trade support during the Representative's term. In these regressions, the unit of analysis is now the Representative-Congress, allowing me to control for all observed and unobserved confounds at the individual level with Representative fixed effects. The specification is presented in equation 2

$$VS_{i,c} = \alpha + \beta_1 T_{d,c-1} + \beta_K D_{d,c-1} + \gamma_c + \lambda_i + \epsilon_{d,c} \quad (2)$$

where $VS_{i,c}$ is the incumbent i 's vote share in Congress c , $T_{d,c-1}$ is, again, the trade-related layoffs in the incumbent's Congressional District d in the prior Congressional term $c - 1$, $D_{d,c-1}$ is a K -length vector of time-varying District controls, γ_c are Representative fixed effects and λ_i are Congress fixed effects. Note that the dependent variable is measured at the Representative level while the treatment variable remains measured at the District level. There is almost perfect mapping from Congressional Districts to incumbents in my data. I drop observations for which the incumbent did not serve the full previous Congressional Term, allowing the specification presented in equation 2. The results are presented in Table 5.

Table 5: Free Trade Support and Import Penetration Shocks

	(1) Lay-offs	(2) Free-Trade	(3) Subsidies	(4) Barriers
Share of Pop. Laid-Off	.08 (.27)	.27 (.51)	.51 (.35)	-.61 (.54)
Free-Trade Support		-1.79** (.88)		
Lay-Offs × Free-Trade		-.44 (.83)		
Anti-Subsidies			-.93 (.81)	
Lay-Offs × Anti-Sub			-1.34** (.61)	
Anti-Barriers				-.39 (1.19)
Lay-Offs × Anti-Bar				.95 (.87)
District Controls	Yes	Yes	Yes	Yes
Representative FE	Yes	Yes	Yes	Yes
Congress FE	Yes	Yes	Yes	Yes
N	2184	2166	1828	1843

Notes: Column 1 presents the simple relationship between trade-related layoffs during the previous Congressional term and the incumbent vote share in the following election. Columns 2 - 4 include interactions of layoffs with legislative support for free trade in the previous term (2), legislative support for removing subsidies (3), and legislative support for removing barriers. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

The top row of Table 5 suggests that voters do not punish incumbents for trade-related layoffs in the following election cycle. Furthermore, column (2) indicates that, even in Districts which experienced trade-related layoffs and were represented by a pro-free trade Congressperson, voters did not punish the incumbent. However, there is evidence that voters punish incumbents who vote to remove subsidies in response to trade-related layoffs in column (3).

Assuming that subsidies are more salient to voters, these results are to be expected. Substantively, the results suggest that voting in a protectionist manner actually improves an incumbent's chances of reelection when more constituents are laid off. Conversely, voting in a more pro-free trade manner reduces the incumbent vote share. Figure 7 plots the marginal effects of trade-related layoffs on incumbent vote share for incumbents who systematically vote for or against anti-subsidy legislation over a two-year Congressional term. (With roughly 3 subsidy votes per session, the lines amount to voting against free trade never, once, twice, or always.) As illustrated, experiencing trade-related layoffs of almost 16,000 workers over a two-year term reduces incumbent vote share from an average of 68% down to 56% for Representatives who are staunchly anti-subsidy.

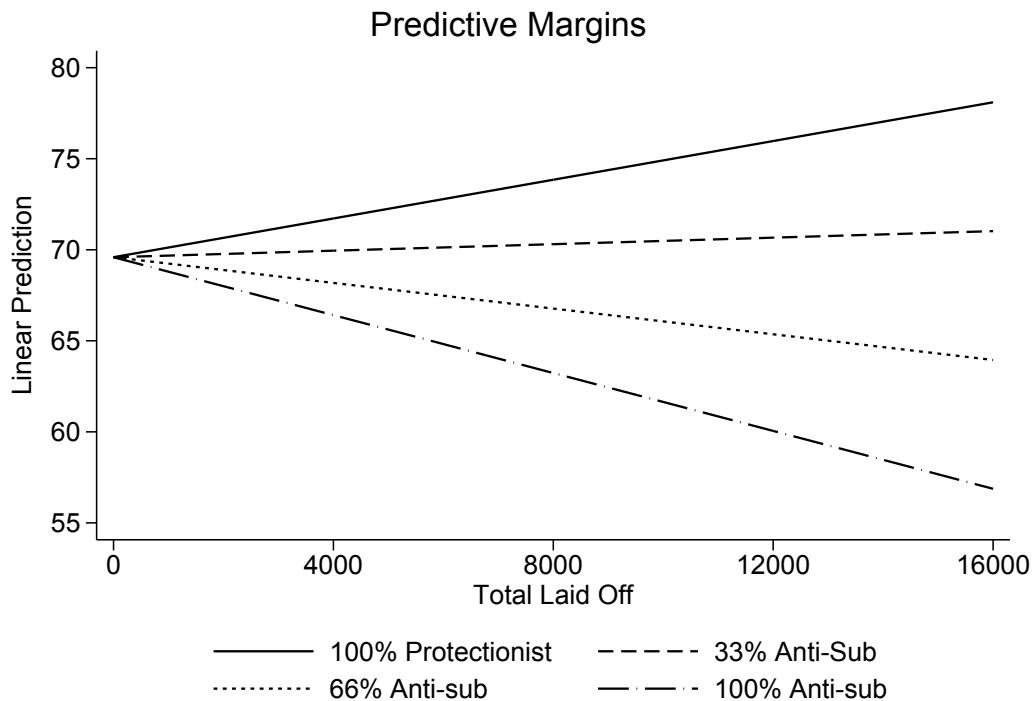


Figure 7: The effect of trade shocks on incumbent vote share when interacting different voting records on subsidy legislation in the preceding Congressional term.

IV.ii-d Interest Groups

Having documented the voter pathway, I turn to an analysis of the influence of interest groups. In this analysis, I examine the effect of a trade shock conditional on different measures of interest group influence (specifically, campaign contributions at the Representative and District level in the prior election cycle). The interaction effects reflect the legislative response to trade-related layoffs as more money is received from different interests. Positive interaction terms indicate that the Representative is less responsive to layoffs while negative terms augment the negative relationship between free trade support and trade-layoffs. The interacted coefficients are presented in Figure 8.

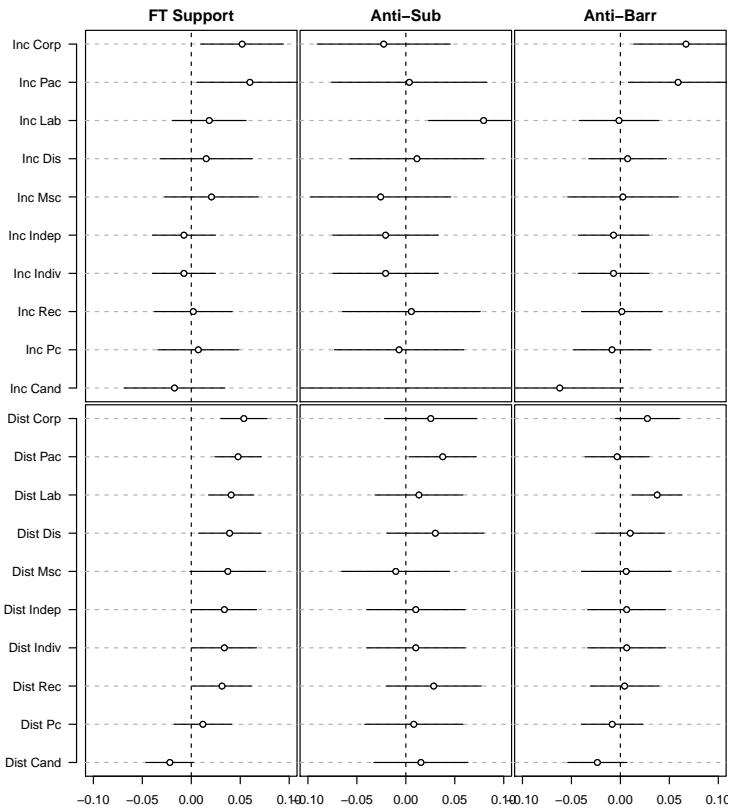


Figure 8: The effect of trade shocks on legislative support for free trade when interacted with the total amounts of campaign contributions received by the Representative from special interests (top panel), and when interacted with total amounts of contributions at the District level (bottom panel). Results presented for campaign contributions from corporations (Corp), political action committees (Pac), labor (Lab), miscellaneous (Msc), independent ideological groups (Indep), individual contributions (Indiv), party committees (Pc), and from the candidate's own savings (Cand). In addition, I also examine the effects of total disbursements (Dis) and total receipts (Rec).

As illustrated, the direct contributions to an individual Representative's campaign (top panel) is noisy although there is evidence that contributions from corporations (Corp) and Political

Action Committees (Pac) lead to more support for free trade even after the District has faced trade-related layoffs. In particular, this result is driven entirely by legislation on barriers to trade, suggesting that organized interests focus on more sophisticated policy tools than voters. The remainder of the disaggregated interest group measures are null, suggesting that focusing on the contributions to specific Representatives do not alter their behavior.

The bottom panel tells a different story in which total interest group activity within the District systematically reduces protectionist responses to trade-related layoffs. The only exceptions to this pattern are the interaction term on campaign contributions from the candidate him/herself and party committees. Indeed, the term on candidate contribution is marginally significant and negative, suggesting that the more money candidates can provide for themselves, the less susceptible they are to outside sources with different political agendas.

However, the consistently positive interaction terms on the remainder of the District-level interest group activity contradicts certain assumptions about interest group policy preferences. While corporate interests and PACs comport with a basic understanding of trade's winners and losers, the positive interaction term on labor is unexpected. In theory, labor groups should support protectionist legislation, particularly following trade-related layoffs. Yet the data suggests that these interests also mute the protectionist response to layoffs, contradicting a reductive assumption that labor is import-competing in the United States.

The most likely explanation for these results is that all measures of District-level interest group activity merely proxy for the same latent variable of total interest group activity within the District. The stronger the presence of all organized interests in a District, the less responsive politicians are to diffuse constituent preferences, weakening the negative relationship between trade-related layoffs and protectionist legislation. The conclusion is reinforced by the non-significant measures for party committee and candidate contributions which do not capture the same latent dimension (indeed, candidate contributions could indicate independence from interest group influence).

Overall, the stronger results at the District-level comport with the understanding of interest group behavior (Gilligan [25], Gray and Lowery [27, 28]) in which campaign contributions are not thought to purchase immediate policy responses but rather are used to gain access to politicians. This is reflected in the null results for the campaign contributions received by specific Representatives but the systematic positive results for campaign contributions at the District level.

These findings indicate that the amounts received by particular Representatives in the previous election cycle do not covary systematically with policy responses to trade shocks. However, the total amounts contributed to all candidates in a District are a good proxy for interest group influence and prompt the politician to mute their responsiveness to trade-related layoffs. Figure 9 summarizes the marginal effects of this relationship for labor and corporate contributions at the 10th and 90th percentiles for Representatives and Districts.

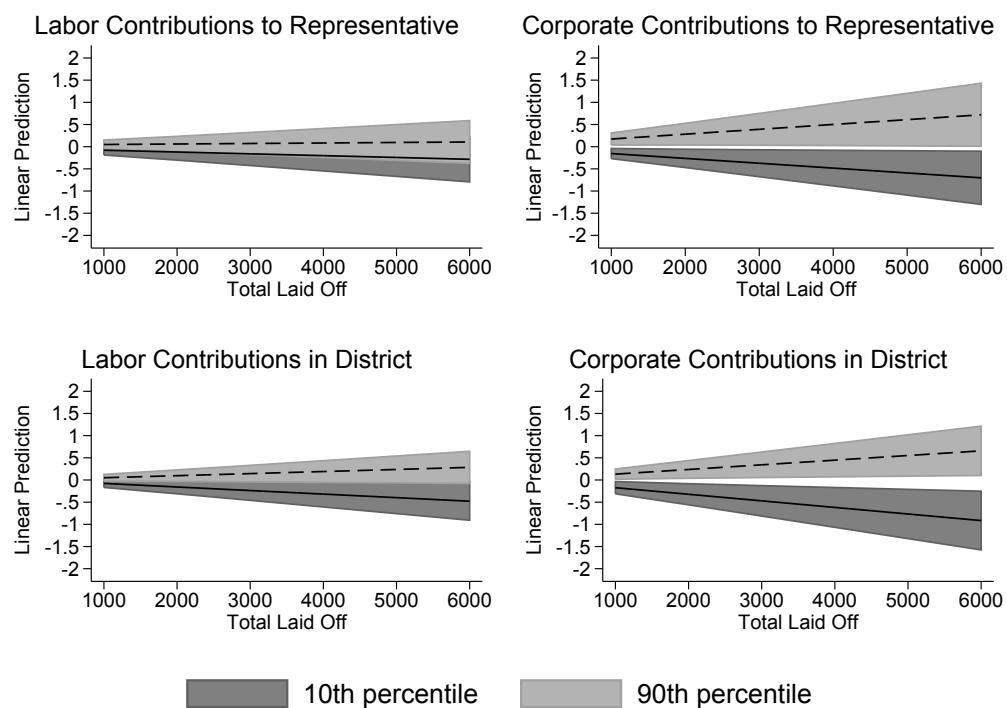


Figure 9: The effect of trade shocks on legislative support for free trade when interacted with the total amounts of campaign contributions from labor (left panels) and corporations (right panels) to the Representative's campaign (top panels) and in the District overall (bottom panels). The shaded regions represent the marginal effects for contributions in the 10th and 90th percentiles.

The marginal effects underscore the intuition of how interest group influence alters the voter mechanism described in my main results. Following trade-related layoffs, Representatives behave in a more protectionist fashion when they are not subject to interest group influence. However, when interest groups are active in a District, there is no relationship between layoffs and legislative behavior. Indeed, there is even evidence of a positive relationship between free-trade support and trade-related layoffs in Districts with heavy corporate influence (highlighted in the bottom-right panel of Figure 9).

V. ROBUSTNESS CHECKS

In the following section, I present the results of robustness checks that re-run my main specification on different measures of my dependent and treatment variables. In addition, I present placebo tests to confirm my findings are not the product of reverse causality. Finally, I characterize the threat posed by omitted confounds via sensitivity analysis.

V.i Robustness

Re-running my main specification using different measures of the dependent and treatment variables finds consistent support for my conclusions. In addition, the results persist regardless of whether trade shocks are measured using the full dataset of estimated jobs lost (including both certified and denied applications) as well as restricting analysis to only those for which the Department of Labor ruled in favor of the application. These results are summarized in Figure 10.

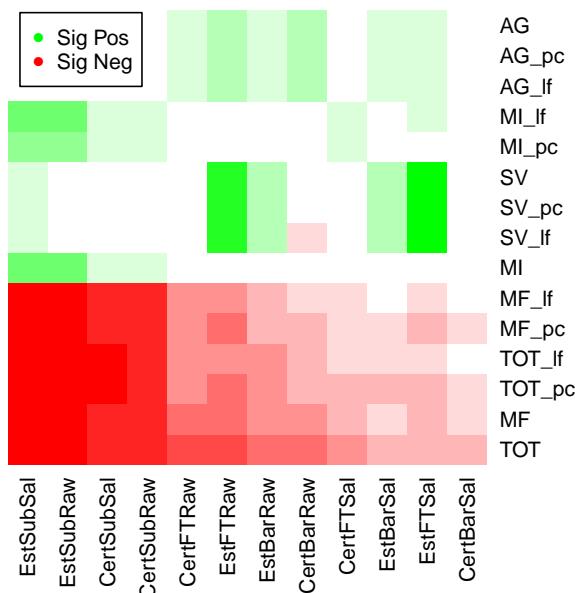


Figure 10: Robustness checks using different measures of dependent and treatment variables. Each square represents a *t*-statistic on the TAA coefficient. Darker red (green) indicates more significant negative (positive) coefficients. Insignificant results are white. The rows indicate the TAA measures which include specific industries (total (TOT), manufacturing (MF), mining (MI), services (SV), and agriculture (AG)) and the units of measurement (total laid off, share of total District population (pc), and share of total District labor force (lf)). The columns indicate different measures of free trade support, including aggregation of the measure (free trade (FT), subsidies (sub), or barriers (bar)), the salience (raw or sal), and whether the number of laid-off workers is based on the total estimates from all TAA applications (Est) or only those applications which were certified by the DOL (Cert).

As illustrated, the negative relationship between the number of workers laid-off due to trade and Congressional support for protection persists across all measures of the dependent and treatment measures for the total TAA data and the manufacturing data. However, moving to other industries results in much less consistent estimates. This is partially due to the sparser data. Overall, none of these positive coefficients persist across all measures of the outcome variable and the more abundant industries are consistently in the expected direction.

As an additional test, I redo my analysis using import penetration instead of trade-related layoffs. Import penetration pervades the labor economics literature and is favored when making causal claims about local labor market outcomes for which import penetration measures are plausibly exogenous. This measure is less precise for my research given the fuzzy connection between import penetration and labor market outcomes that affect policy preferences. Nevertheless, I present the results in Figure 11 to connect my research to the labor economics literature.¹

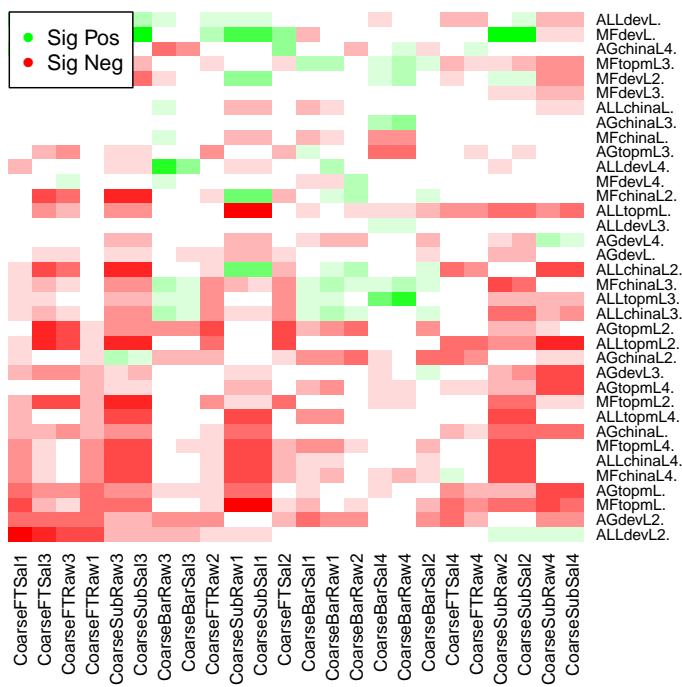


Figure 11: Robustness checks using import penetration. Each square represents a t-statistic on the import penetration coefficient. Darker red (green/white) indicates more significant negative (positive/null) coefficients. The rows indicate the import penetration measures which include specific industries (all (ALL), manufacturing (MF), and agriculture (AG)), imports from specific partners (China, the developing world (dev), and the top 15 US trading partners (topm)), and lags ranging from 1 to 4 years (L. through L4.). The columns indicate different measures of free trade support, including aggregation of the measure (free trade (FT), subsidies (sub), or barriers (bar)), the salience (raw or sal), and the period of aggregation (1 - 4 years).

¹Please see the appendix for a description of the IPW measure.

While the import penetration results are less robust than TAA layoffs, the results nevertheless indicate support for my main hypothesis. The majority of the results are in the expected direction with only a handful finding a positive relationship between this traditional measure of trade's negative effects and legislative support for free trade. Nevertheless, it is harder to make a causal claim on these results, given the ability of politicians to anticipate the treatment and the looser connection between changes in import penetration and constituent preferences for trade policy.

As a final robustness check, I rerun my main results dropping 10% of the observations at random. I run these tests 1,000 times, each time generating an estimate of the coefficient and standard error. I plot these as a density in Figure 12. Reassuringly, the coefficients consistently fall below zero for all measures of the dependent variable, indicating that my results are not driven by outliers. However, this test does suggest that my point estimate for subsidies is exaggerated in Table 4, with the true value lying closer to -0.04.

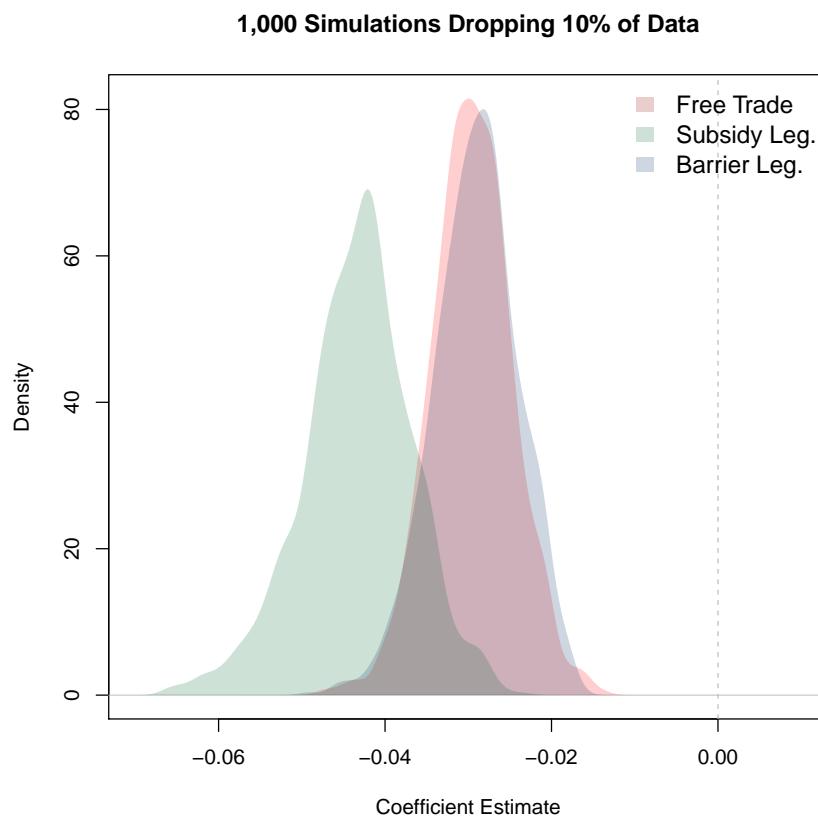


Figure 12: Robustness checks measured by dropping 10% of the data at random and re-running the most rigorous specification on all free-trade support (red), subsidies (green), and barriers (blue). The density plots indicate the coefficient estimates from 1,000 simulations.

V.ii Reverse Causality

I argue that the experience of losing one's job affects politician behavior by reducing constituent support for free trade legislation. However, it is possible that free trade policies might themselves lead to job losses, resulting in a spurious causal claim. In order to test this, I repeat my main analysis but lag my dependent variable, effectively regressing free trade support in time $t - 1$ on trade-related unemployment in time t . The results are presented in Figure 13 which plots the estimated coefficients of the effect of a trade shock on free trade support in the four years prior to, and following, the layoff date. As illustrated, the negative effect is significant only in the year following the shock. In addition, there is suggestive evidence of a positive reverse relationship, in which pro-free trade legislation precedes layoffs. These results are robust to different measures of the dependent and treatment variables.

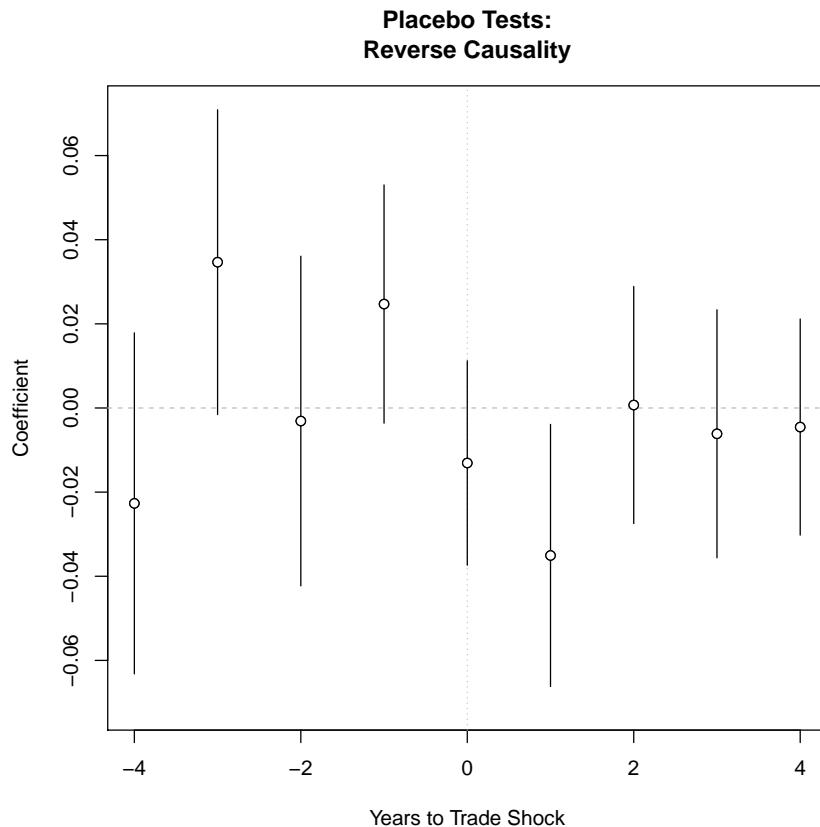


Figure 13: Effect of trade-related lay-offs (measured at time $t = 0$) on free-trade support in four years prior to, and following, the lay-offs. The effect is only significant in the following year. As expected, we do see a positive relationship between free trade policy and layoffs in the years prior to the TAA measure.

V.iii Sensitivity Analysis

Following Imbens [31], I generate a confounding variable that is correlated with both treatment and outcome and re-estimate the coefficient of interest to characterize the sensitivity of my results. Figure 14 plots the results of 500 simulations of this exercise in which the confounder is randomly correlated with both the outcome and the treatment variables. The hollow-circles represent coefficient estimates on the relationship between trade-related layoffs and free-trade support that fall within 2 standard errors of my main estimate. The crosses represent all control variables, providing a benchmark against which a potential confounder can be compared.

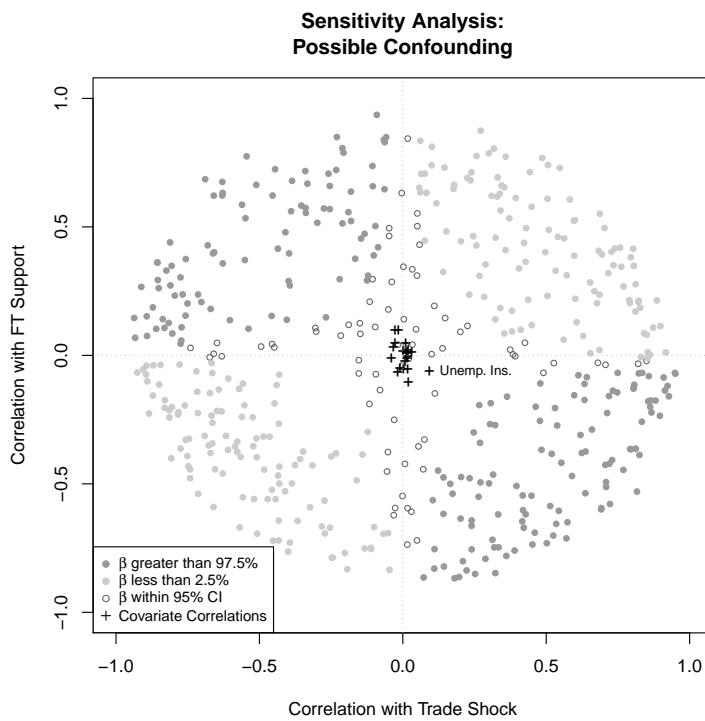


Figure 14: Coefficient estimates produced by including a randomly-generated confounder indicated by circles. The x and y axes chart the level of correlation with the treatment (x-axis) and dependent variables (y-axis). Hollow circles represent coefficients that are within 2 standard errors of my main results. Observed covariates are indicated by crosses.

Reassuringly, my sensitivity analysis indicates that an unobserved confounder would need to be more highly correlated with both my dependent and treatment variables than my measure of unemployment insurance transfers at the District level (the most correlated of my controls). While the figure should not be taken as evidence that no such confounder exists, it does suggest that my results are not highly sensitive to confounds.

VI. CONCLUSION

I have demonstrated a consistent negative relationship between Congressional support for free trade legislation and trade shocks, measured as trade-related layoffs using Trade Adjustment Assistance petitions with the Department of Labor. I argue that this relationship is causal based on the exogeneity of the layoffs to voters' socio-tropic policy preferences as well as the rigorous controls I employ to isolate the pathway of interest. Without random assignment to treatment, my specification does not guarantee a causal relationship. However, I demonstrate that the results are not driven by reverse causality via placebo checks. Furthermore, I conduct sensitivity analysis to demonstrate that potential confounders would need to be more strongly correlated than any observed covariates with both the outcome and treatment variables in order to be driving my results. Finally, I demonstrate the robustness of my findings to outliers by dropping 10% of the data at random and recovering the same effects.

I supplement my analysis of Congressional voting behavior with speech analysis in which I find evidence of Representatives from negatively affected Districts adopting protectionist rhetoric relative to Representatives from unaffected Districts. In addition, I present evidence of heterogeneous effects by bill type, finding much stronger results for subsidies than for legislation related to other types of trade protection. Furthermore, politician responsiveness is stronger in election years and in more contested Congressional Districts, further supporting the voter mechanism I claim to identify.

I conclude with evidence of stronger effects in Districts with greater political activism by interest groups, measured by total campaign contributions in the previous election cycle. I find that the negative relationship between trade-related layoffs and free-trade legislation disappears in Districts with a strong interest group presence. These results suggest that interest groups compete with diffuse constituents for policy outcomes.

However, it is important to acknowledge that these findings have only sketched the micro-foundations of the voter pathway from trade shocks to trade policy. Despite the suggestive evidence and rigorous controls, I cannot claim that the change in politician behavior is due to a shift in public opinion on trade. An alternative mechanism is that a challenger threatens to exploit the trade-related layoffs in the following election, prompting the politician to minimize electoral

damage by taking legislative positions that they can point to during the election campaign. Future research should examine the rhetoric used by both incumbents and challengers during the election cycle to help untangle the remaining micro-foundations of the voter mechanism. Regardless of whether the accountability travels via the change in constituent preferences (as suggested by the electoral punishments) or via enterprising challengers, my findings underscore the election incentives that are essential to theories of why democracies are more open to trade.

A final but important caveat on my results is that they explore the voter mechanism by using variation in trade's *painful* outcomes. The β coefficient describing the negative relationship between trade's deleterious effects and free trade support requires the additional assumption of symmetry to interpret my findings as supporting IPE's foundational assumptions. Concluding that, because I find negatively affected voters lead to protectionist policy, therefore we should expect that positively affected voters lead to free trade, is heroic. As anticipated in the introduction, trade's diffuse benefits for consumers are unlikely to manifest in policy preference shifts that politicians would respond to.

Nevertheless, I argue that these results constitute causally-identified evidence of voters who are aware of, and politically active on, trade policy. My findings contribute to the existing research on electoral responsiveness and accountability by capturing the full pathway from shocks to constituent preferences through to policy outcomes. My findings also document the micro-foundations of voter influence on trade policy that underpins much of the IPE literature's most popular theories. In addition, the heterogeneous effects over interest group activity highlights a potential way to improve the empirical work on lobbying. I leave an exhaustive characterization of interest group activity to future research.

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A. DATA

The data is assembled by merging several different sources of data aggregated at various levels of geography. I use a variety of crosswalks to assemble the final dataset in which each observation is a Congressional District-year. Most of the demographic District controls were obtained from the NHGIS database [37] which aggregates data to the Congressional District level. Earlier years were missing data on several covariates which I supplemented using E. Scott Adler's Congressional District dataset [2].

Measures of unemployment were taken from the Local Area Unemployment dataset published by the Bureau of Labor Statistics [5]. This dataset measures unemployment rates at the county level, allowing me to aggregate the measures up to the Congressional District using the University of Michigan's MABLE Geocorr software [47]. Other measures recorded at the county level include personal income and government transfers [48].

I obtained measures of incumbent vote-shares, campaign contributions, and ideology scores from Adam Bonica's DIME database (Bonica [12]). I assembled demographic covariate data on individual politicians using GovTrack's historic data on legislators [4]. Table A1 summarizes the data, aggregation, and source for each component of my data.

Table A1: Data Source Description

Measure	Aggregation	Source
District Demographics	Congressional District	NHGIS [37] & Adler [2]
Personal Income & Transfers	County	BEA [48]
Unemployment	County	BLS [5]
Trade-Related Layoffs	County	DOL (via Public Citizen [14])
Import-Penetration	County	CBP [17] & USITC [15]
Campaign Conts & Ideology	Representative	DIME [12]
Politician Demographics	Representative	GovTrack [4]
Free Trade Support	Representative	CATO Institute [3]
Speeches	Representative	Policy Agenda [9] & CapitolWords [1]

In the following sections, I describe my key dependent and independent variables in greater detail.

A.i Bills

To create my measure of legislative support for free trade, I examined voting behavior on a subset of votes that were identified by the CATO Institute as being important pieces of trade legislation ([3]). CATO provides a brief description of the bill and frames the "Aye" vote as either in favor of subsidies (barriers) or against them. A full description of the votes is available online at www.cato.org/research/trade-immigration/congress. I also create a saliency-measure of these votes based on the multi-dimensionality of the bill. Bills that are explicitly about trade policy are scored higher than bills which also deal with foreign aid or national security. In Table A2, I summarize the votes by Congress starting in the 108th, the policy-position of a "Yea" vote, and the salience of the vote to trade. For the full list, please refer to the CATO Institute's website (<http://www.cato.org/research/trade-immigration/congress>).

Vote #	Congress	Yea Vote	Type	Salience
281	113	enact/maintain	subsidies	3
273	113	enact/maintain	barriers	3
263	113	remove	subsidies	3
608	112	remove	barriers	2
224	112	enact/maintain	subsidies	2
96	112	remove	barriers	2
783	112	remove	barriers	3
782	112	remove	barriers	3
781	112	remove	barriers	3
554	111	enact/maintain	barriers	3
456	111	remove	barriers	3
690	110	enact/maintain	subsidies	3
575	110	enact/maintain	barriers	2
346	110	enact/maintain	subsidies	3
315	110	enact/maintain	subsidies	3
181	110	enact/maintain	barriers	3
1060	110	remove	barriers	3
752	110	enact/maintain	subsidies	3
751	110	enact/maintain	subsidies	3
750	110	enact/maintain	subsidies	3
749	110	enact/maintain	barriers	3
747	110	enact/maintain	subsidies	3
583	110	remove	barriers	3
484	110	remove	barriers	2
349	110	enact/maintain	barriers	2
539	109	remove	barriers	3
519	109	remove	barriers	3
392	109	remove	barriers	3
363	109	enact/maintain	barriers	2
283	109	enact/maintain	barriers	2
43	109	remove	barriers	2
616	109	remove	barriers	3
569	109	enact/maintain	subsidies	2
443	109	remove	barriers	3
353	109	enact/maintain	barriers	3
351	109	remove	barriers	3
348	109	remove	barriers	1
345	109	remove	barriers	1
239	109	enact/maintain	barriers	1
235	109	remove	subsidies	2
234	109	remove	subsidies	3
533	108	remove	barriers	1
413	108	remove	barriers	3
375	108	remove	barriers	3
368	108	remove	subsidies	3
484	108	remove	barriers	1
483	108	remove	barriers	1
436	108	remove	barriers	3
432	108	remove	barriers	3
361	108	enact/maintain	barriers	3
256	108	remove	barriers	2
219	108	remove	barriers	3
45	108	remove	barriers	3

I obtained the voting records of all Representatives using GovTrack's API [4]. I score a vote in favor of removing subsidies or barriers as a 1 and a vote in favor of maintaining / enacting the same as a 0. Abstentions and missing votes are scored as NA. I average the free-trade support score by year and Congressional District, creating a continuous measure of free-trade support ranging from 0 to 1. Figure A1 plots the distribution of this variable and overlays the distribution of the salient measure atop the raw measure. As illustrated, the distributions are very similar with the only notable difference being a slight compression toward the center in the salient data.

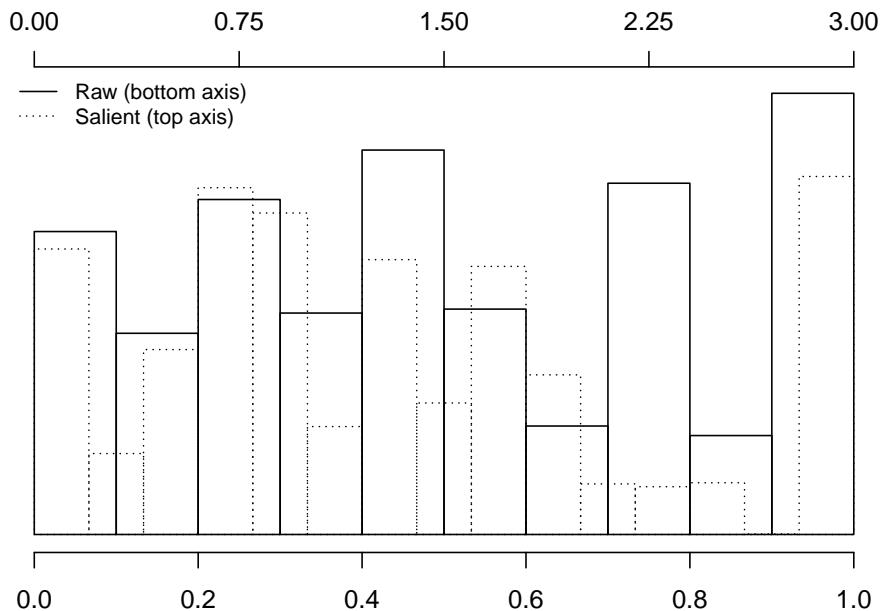


Figure A1: Histogram of free trade support variable by raw measure

A.ii TAA Filings

Trade Adjustment Assistance applications can be filed by any group of three or more workers, an employer, or a union. In rare cases, applications may also be submitted by authorized employees of the state, including State Workforce Officials and Job Center Operators. The majority of applications in my data are submitted by companies (40%) followed by workers (37%) and then unions and authorized officials (23%). These applicants represented 1.05, 1.01, and 0.73 million affected workers respectively. Firm applications see higher success rates with 84% of their estimated workers receiving certification, compared to 64% and 68% for workers and unions respectively.

The vast majority of applications are for workers in manufacturing industries, consisting of 81% of all applications, 96% of all estimated laid-off workers, and 91% of certified workers. Figure A2 summarizes the number of estimated and certified workers by industry, where the x-axis widths indicate the total number of applications filed by industry. I omit manufacturing for visual clarity.

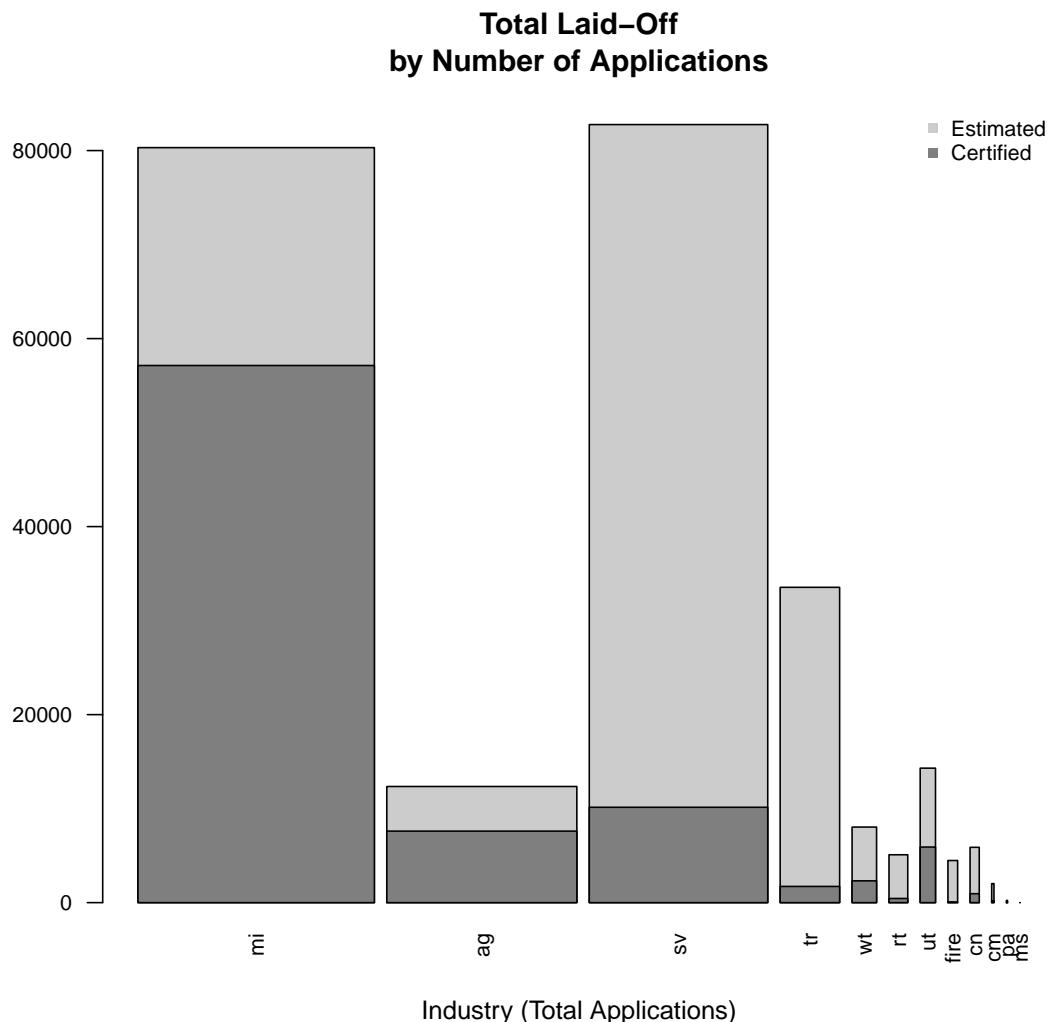


Figure A2: The total number of estimated (light gray) and certified (dark gray) laid-off workers plotted on the y-axis. The x-axis widths indicate the number of applications by industry. Manufacturing is omitted for visual clarity.

A few aspects of the data are worth noting. First, estimated workers in agriculture (ag) are a fraction of those estimated for services (sv), despite having roughly the same number of total applications. Similarly, estimated workers in trade (tr) are very high given the total number of applications filed. However, both trade and services only saw a fraction of these estimated workers certified by the DOL. Indeed, with the exception of manufacturing, agriculture, and mining (mi), all other industries saw very low certification rates. These trends suggest that credible claims of trade-related layoffs cleave closely to the industry lines predicted by Hecshler-Ohlin theory. (Or at least, the DOL's assessment reflects this.)

A.iii Import Penetration

The import penetration instrument is based on research by Dorn et al. [18] and David et al. [16]. The instrument relies on the assumption that increasing competition from foreign imports has a deleterious effect on domestic employment and wages in the affected sector. Existing research has used this instrument exclusively within the context of the manufacturing sector in the United States. This paper expands the number of industries to include the full range of the SIC and NAICS industry codes list and catalogs variation at the monthly level between 1989 and 2014.

Calculating this instrument is a three-step process involving two levels of imputations in order to obtain employment at the 4-digit SIC level and 6-digit NAICS level on a monthly basis. Two separate datasets were employed to build this variable. The first is employment data from the County Business Patterns branch of the US Census [17] which records detailed employment data in mid-March at fine levels of aggregation. The second is from the Bureau of Labor Statistics which records employment information in a similar manner at the monthly level but at a less granular level of industry aggregation [48]. The following section discusses the imputations associated with building the dataset in detail.

A.iii-a CBP Data

While more detailed than the BLS data, the County Business Patterns data still contains many missing observations, owing to the confidentiality requirements of the survey. However, it also includes information on the firm size at the county level which can be used to impute detailed employment by industry. I use a modified version of David Dorn's imputations .do file (available on his data page at <http://www.ddorn.net/data.htm>) to use the firm size bins to put bounds on the imputed employment values where they are missing. Specifically, the program identifies the level of aggregation at which data is missing and iteratively winnows down the upper and lower bounds on the employment range using the firm size distribution associated with the county-industry cell. This employment range is then further narrowed using the aggregation of subindustries and employment in firms with missing subindustry codes. The resulting imputed employment figures are proportionally assigned to firms with missing data based on the county-wide or nation-wide share of total employment associated with the missing subindustry. The .do file is available upon request.

A.iii-b BLS Data

I use the less granular BLS dataset to estimate the seasonal trends in employment by industry by state by year. Specifically, I regress logged employment on month dummies, omitting March as the reference category at all available levels of industry aggregation by year and by state. I save these coefficients and their standard errors as percentage multipliers for the CBP data. I then create monthly imputed employment measures by multiplying the CBP mid-March imputed employment level by the coefficients and add noise with the standard error. I use the coefficients calculated using the finest level of industry aggregation possible. The theory supporting this process relies on two assumptions: first, that seasonal trends in industries are roughly constant over counties within a state. Second, the process requires the assumption that seasonal trends at the subindustry level are roughly equivalent to seasonal trends at higher levels of aggregation. Where the data is available at the finest level of aggregation (4-digit SIC or 6-digit NAICS), I use the BLS data outright.

A.iii-c Trade Data

Trade data is available from the United States International Trade Commission website [15] from 1989 to present. The period from 1989 to 2001 is available in 4-digit SIC codes while the period from 1997 to 2015 is available in 6-digit NAICS codes. Data were downloaded to record imports from China, the UN's Least Developed Countries, and the US's top 15 importers.

A.iii-d Theory

These data comprise the foundation of the import penetration instrument. To understand the theory behind the relationship between trade shocks and income, I borrow notation from David Dorn [16]. Let the local labor demand in region i in industry j be L_{ij} be a function of the cost per unit produced w_{ij} and the total output Q_{ij} . Total output is itself a function of region i 's production that is sold to regions $n \neq i$ and is represented as

$$Q_{ij} = A_{ij} \sum_n \frac{X_{nj} \tau_{nij}^{-\theta}}{\Phi_{nj}} \quad (3)$$

where $A_{ij} = T_{ij} w_{ij}^{-\theta}$ represents region i 's productivity in industry j as a function of technology (T), production costs (w), and the dispersion of productivity among firms (θ), τ_{nij} represents the bilateral costs of trade between region n and region i , X_{nj} is the expenditure in destination market n in industry j , and $\Phi_{nj} = \sum_h T_{hj} (w_{hj} \tau_{nhj})^{-\theta}$ represents the level of competition in industry j in region n .

From (3) we can understand how trade shocks affect labor outcomes in region i and industry j . An increase in competition ($\Phi_{nj} \uparrow$) reduces output which lowers labor demand. This increase can be the result of either increased productivity ($T_{hj} \uparrow$ or $w_{hj} \downarrow \Rightarrow A_{hj} \uparrow$) or a reduction in trade costs (i.e., from WTO ascension or signing an FTA, meaning $\tau_{nhj} \downarrow$).

Equation (3) can be operationalized following the strategy of David Dorn who sum the output quantities across industries to yield:

$$\hat{Q}_i = - \sum_j \frac{X_{uij}}{X_{uj}} \frac{X_{uhj} (\hat{A}_{hj} - \theta \hat{\tau}_{hj})}{Q_i} \quad (4)$$

This expression is comprised of two components with theoretical value to this paper's empirical strategy. The first expression (X_{uij}/X_{uj}) represents the share of region i in US output u in industry j . An increase in this share increases the exposure of region i to imports from abroad and can be proxied for using the share of regional employment in total national employment in industry j (E_{ij}/E_{uj}).

The second expression represents the magnitude of productivity and trade costs in US imports ($X_{uhj} (\hat{A}_{hj} - \theta \hat{\tau}_{hj})$) relative to the region's total output (Q_i). The larger this expression, the more exposed region i is to import competition from abroad. As above, I proxy for total regional output (Q_i) with total regional employment (E_i). Since it is impossible to obtain detailed information on foreign productivity or expenditures on foreign goods in industry j , I use the change in US imports from abroad in industry j (ΔM_{uhj}). Taking these together and looking over time period t yields:

$$\Delta IPW_{uit} = \sum_j \frac{E_{ijt}}{E_{ujt}} \frac{\Delta M_{uhjt}}{E_{it}} \quad (5)$$

This expression serves as the core instrumental variable for this analysis. It is used to predict changes in income in region i that is exogenously generated by changes in either foreign productivity or trade costs which, in theory, are orthogonal to local crime outcomes. As emphasized by Dorn et al., this measure does not attempt to allocate imports to specific regions. Rather it calculates industry exposure by “[measuring] the *potential* exposure to import competition that local labor markets face due to their industry specialization.”² The t index represents the measure of the relevant variable at the beginning of the time period while the Δ represents the change in value from the beginning to the end of the same time period. This paper uses 1 through 4 year measures to control for simultaneity bias and allow for the explanatory variables to have an impact.

B. TEXT ANALYSIS

The text analysis conducted tests whether Representatives from trade-affected Districts speak differently about trade than those from unaffected Districts. I focus specifically on the language of the Representatives while they are speaking on the floor of Congress about bills concerning trade policy. Doing so allows me to characterize rhetorical behavior which, while not as immediate in its policy implications as voting behavior, is nonetheless more policy-relevant than speeches given to constituents. Speeches given on the floor of Congress are theoretically influential not just in terms of opinion but also in terms of policy outcomes whereas speeches directed at constituents are more at risk of being purely cheap-talk. In the sections that follow, I describe the data and methods as well as a description of the topics I assign in order to validate my claims.

B.i Data

I collected all speeches from the floor of Congress issued between 1994 and 2015 on the all trade-related legislation. In order to get greater coverage on both Representatives and speeches, I used the Policy Agenda database (Baumgartner [9]) to identify bills related to trade. While many of these bills are less salient than those listed by the CATO Institute, they are nevertheless related to trade. Overall, this resulted in 1,540 speeches on 332 pieces of legislation. Importantly, I did not categorize the bills as being either pro- or anti-free trade. Rather, I let the data speak for me and only analyzed whether the topics generated by a structural topic model differed systematically between affected and unaffected Districts.

²David Dorn [16] pg. 8

These speeches were given by a subset of Representatives, counting only 422 strong over the period in question. The majority of these Representatives only gave a handful of speeches on trade-related legislation, as illustrated in Figure A3. However, a few outliers were vociferous on the topic of trade, notably Representative Sheila Jackson-Lee (D-TX18) who took to the floor on the topic of trade in 49 separate occasions. Her District also experienced some of the highest levels of trade-related layoffs, particularly in 1999 when almost 2,000 individuals were laid off for trade-related reasons. Another outspoken Representative is Congressman Philip Crane from Illinois' 8th District which saw fewer dramatic layoffs. In accordance with the theoretical expectations of this paper, Representative Jackson-Lee voted in favor of trade-protection far more frequently than did Representative Crane.

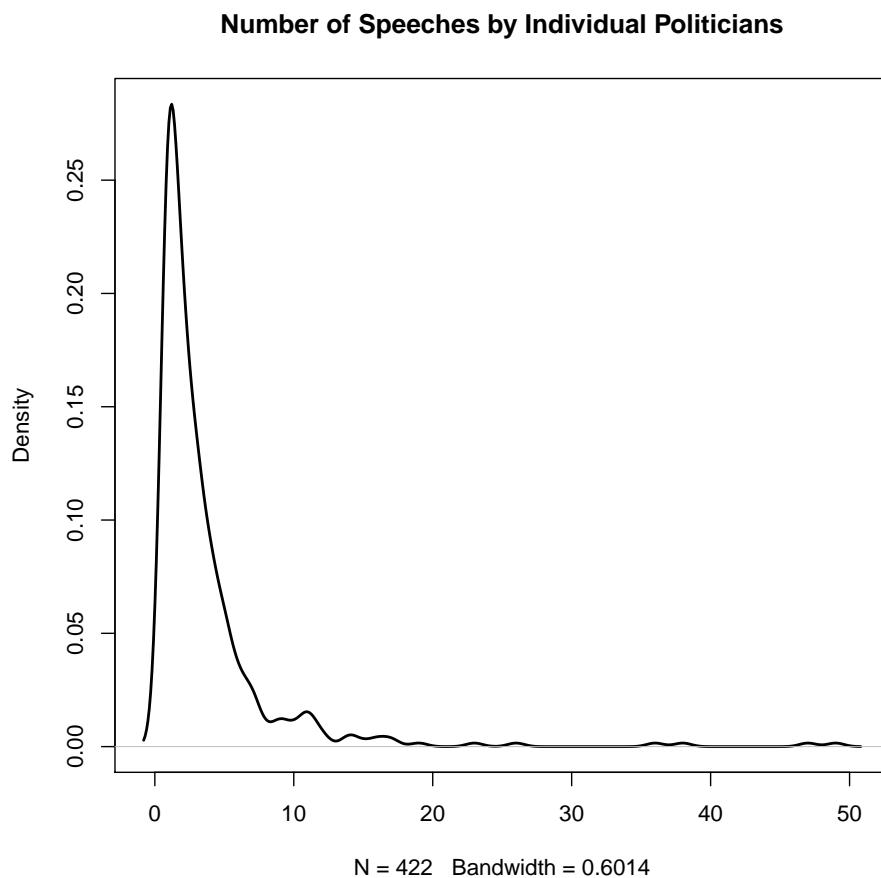


Figure A3: The number of speeches on trade legislation given by individual Representatives.

While I do not classify each bill as being pro- or anti-free trade, I do examine which types of bills generated the most discussion. The Policy Agenda Project categorizes bills by both topic and subtopic. Figure A4 plots the number of speeches associated with each subtopic in the dataset. The horizontal axis widths reflect the relative number of bills attributed to each subtopic. As such, a type of legislation that generates a lot of discussion with only a few bills would be tall and narrow whereas a subtopic that is the focus of a lot of legislation but receives only limited discussion would be short and wide. As illustrated, there is little evidence that certain subtopics are discussed disproportionately to the number of bills associated with them. Bills related to import regulation comprise 49% of all the bills in my analysis and are talked about 36% of the time whereas there are only three bills concerning exchange rates and each bill is discussed only a few times.

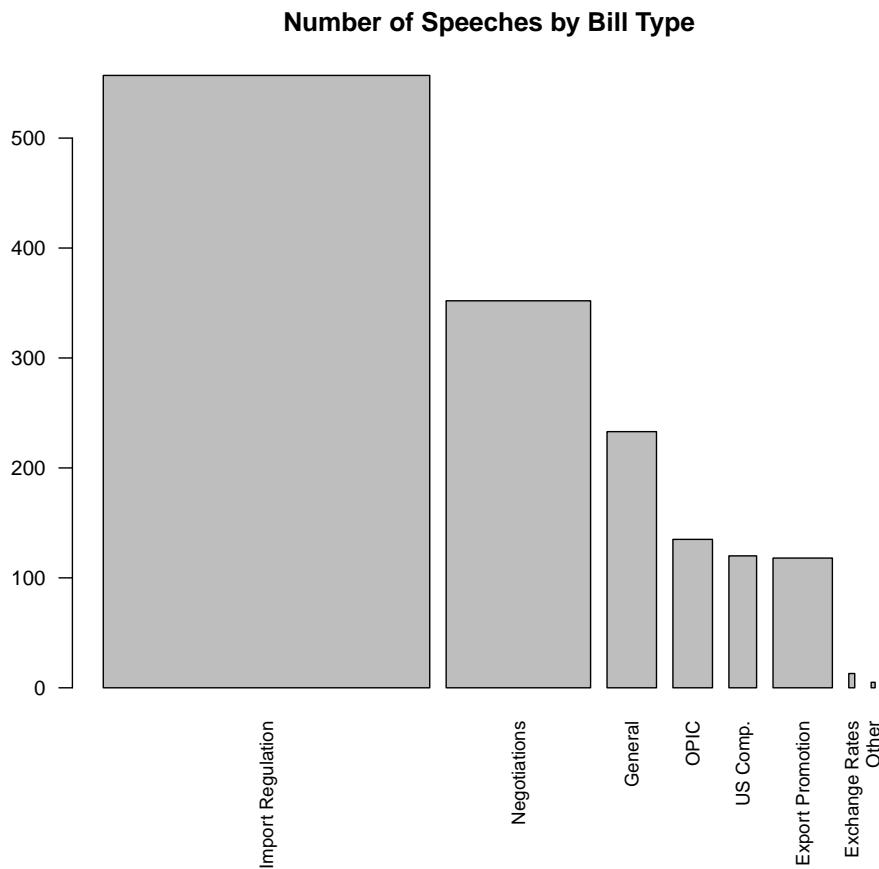


Figure A4: The number of speeches on trade legislation relating to specific types of trade policy. The y-axis plots the number of speeches associated with each topic while the x-axis widths indicate the share of the total bills associated with the topic.

B.ii Methods

I use Brandon Stewart's Structural Topic Modeling R package (Roberts et al. [43]) to analyze the data. This package approaches topic modeling in a very similar fashion to more traditional techniques such as Latent Dirichlet Allocation (LDA). It uses a bag-of-words approach in which

an algorithm creates “topics” based on words or combinations of words that are clustered together both across and within speeches. The approach is based on the intuition that the choice of words reflects an underlying latent dimension of interest, such as a topic. For example, a protectionist Representative could reasonably be expected to emphasize terms like US manufacturing, American farmer, fair trade, and price gouging more than a free trade Representative. Insofar as emphasis is correlated with frequency, this protectionist policy position can be uncovered by looking for collocations of these key terms.

In practice, topic modeling works agnostically. An algorithm searches for words that co-occur with non-trivial frequency. It is up to the researcher to then analyze both these words, as well as the original documents, to characterize the substantive content of the topic. Traditional topic modeling techniques assign each word to a temporary topic based on a prior distribution (LDA analysis uses the titular Dirichlet distribution as the prior for assigning topics). The algorithm then loops over every word in every document, updating the topic assignment based on (1) the prevalence of the word across topics and (2) the prevalence of the topics across documents. This process iterates, further refining the topic assignments.

Structural Topic Modeling improves upon this basic framework by allowing the researcher to incorporate covariate information in the form of meta data. These covariates can include demographic information on the speaker, temporal information on when the document was created, or anything else the researcher chooses to incorporate. In this paper, I use the information on trade-related lay-offs along with several controls to augment the topics that the algorithm identifies.

B.iii Topic Validation

As mentioned above, topic modeling relies on the subjective interpretation of word collocations by the researcher. While the reliance on subjective interpretations may be troubling, in a sense this is no different than the selection of any type of data to speak to a theoretical quantity of interest. My selection of roll call votes on a subset of bills deemed to be trade-relevant by the CATO Institute is no more subjective than claiming combinations of words represent a policy-position on trade. In both cases, the observable behavior is posited to reflect an underlying behavior of interest.

Of course, roll call votes are a more concrete measure with clearly defined implications associated with “Aye” and “Nay”. In order to justify the topics I identify in the text analysis, I present supporting evidence of the top words, the speeches most strongly associated with each topic, and comparisons of top-scoring words by topic.

In identifying the topics produced by STM, I begin by looking at the top-scoring words associated with each topic. I then look at a subset of the speeches themselves associated with each topic. Finally, I compare the word scores associated with topics discussed by politicians from trade-affected Districts with the scores associated with unaffected topics. Figure A5 presents the three top-scoring words associated with each topic, along with the prevalence of each topic throughout all speeches analyzed.

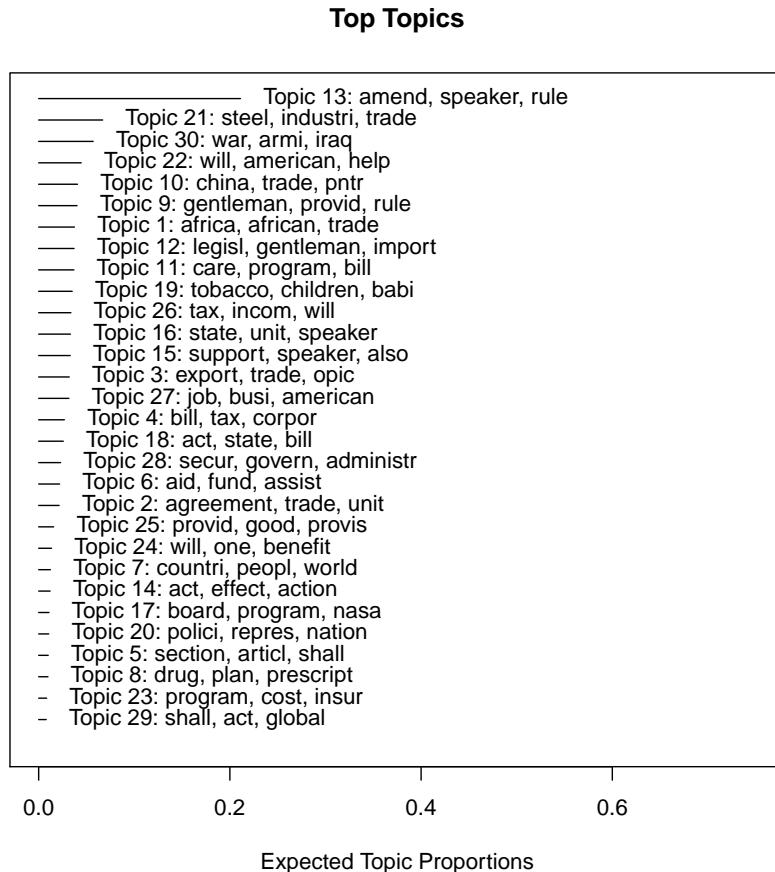


Figure A5: Expected proportions of each topic across all speeches. Top three highest scoring words associated with each topic listed.

From this initial analysis, there are some obvious intuitions regarding the content of the topic due to the word scores. For example, the most prevalent topic (number 13) appears to be about procedural language used in speeches on the floor of Congress. Specifically, almost all floor speeches begin with the Representative addressing his remarks to the Speaker of the House. In addition, many speeches regarding any type of bill typically end with a concluding statement regarding the Representative's preferred action on the legislation, either asking for a suspension of the rules or the consideration of an amendment. Unsurprisingly, despite topic 13's prevalence (which I will name "procedural"), the topic does not differ systematically by trade shocks.

Topics that appear to be more relevant to trade policy include topics 10, 1, 3, and 27 based solely on the three top-scoring words associated with each. However, as we will see, relying solely on the top-scoring words risks mis-characterizing each topic. Figure A6 plots a snapshot of the speeches associated with the topics that are systematically emphasized by Representatives from negatively trade-affected Districts. These topics are those that I label “US Steel”, “Fair Trade”, “Job Creation”, and “Trade Deficit” in my main analysis.

<p>Topic 12</p> <p>of Representatives. I believe that the crisis facing the U.S. steel industry and the lack of an effective response by the Clinton–Gore administration has forced Congress today to take action. I very much regret that circumstances have brought us to the point that Congressional action was necessary. I believe, and I think that many of the parties agree, that it would not be necessary for us to even consider this legislation today if the administration had used all of the tools available to it under current law and consistent with all of our international obligations. I support this legislation. I urge its passage by the full House of Representatives, and I call on my colleagues to stand up for steel. I have</p>	<p>Topic 16</p> <p>Visclosky legislation, H.R. 975. It is necessary for this Congress to act to bring fairness to the steel industry, fairness in our trade policies. I support open trade markets, but only fair trade, not free trade. In the 1980's the steel industry came under heavy assault by countries dumping their steel here in the United States. The United States did nothing. We almost lost our steel industry. In my district, we mine iron ore, and we make iron ore pellets. To make the steel, Mr. Speaker, we need the iron ore pellets. Without our iron mines, there is no steel industry in the United States. In the 1980's, prior to the illegal dumping, there were over 4500 miners in the Upper Peninsula of Michigan. Today our mines</p>
<p>Topic 27</p> <p>Jobs Creation Act of 2004. The rule waives all points of order against the conference report and against its consideration. The rule also provides that the conference report will be considered as read. Mr. Speaker, over the past several years, America's economy has experienced more than its fair share of setbacks. We have had a triple shock of terrorist attacks, corporate scandals and a recession, but each and every time, this administration and this Congress has responded with sound policies to move forward, to create jobs, to stimulate economic growth. After inheriting a slowing economy, President Bush and this Congress reacted quickly and enacted a series of tax cuts that resulted in the shortest and shallowest recession</p>	<p>Topic 3</p> <p>the point where we are at an all-time historic high of a trade deficit, and even the free trade economists such as Alan Greenspan are concerned about the implications of such massive trade deficits. The trade deficit is extremely important to narrow in order to assure a robust American economy. U.S. exports are barely keeping even with last year's level. It is encouraging that the number of small companies that have entered the export area have grown dramatically from 1987 to 1997, as shown by this chart. In addition, nearly two-thirds of all U.S. exporters had less than 20 employees, as is evidenced on this chart here, so we can see that more and more small businesses are becoming involved in exporting. Most small businesses are only casual exporters, that is, they</p>

Figure A6: Snapshots of speeches associated with trade-affected topics.

Understanding how these topics relate to trade shocks requires comparisons of the word associations with each topic. Recall that each word is scored based on its contribution to each topic, allowing words to be associated with multiple topics. In Figure A7, I plot the top-scoring words associated with topic 3 (“trade deficit” which is significantly more associated with speeches given by Representatives from negatively affected Districts) and topic 6 (“foreign aid” which is significantly more associated with the rhetoric used by Representatives from unaffected Districts). As illustrated, while there is some overlap in word associations across topics, the “trade deficit” topic emphasizes protectionist topics such as American farmers and manufacturing, jobs and income, and business and companies, all under a general emphasis on taxes. Meanwhile foreign aid rhetoric appears to be focused on Iraq, sanctions, and potentially human rights.



Figure A7: Word-strength associated with topics systematically discussed by Representatives from affected (topic 3 or “trade deficits”) and unaffected (topic 6 or “foreign aid”) Districts. Placement on the x-axis indicates association of the word with each topic with the vertical dashed line indicating an equal split across topics. Word size indicates strength of association.

Finally, STM also allows the researcher to look at the word strength for top-scoring words in a topic divided by subsets of speeches. I present the comparison of the “trade deficit” topic’s top-scoring words between affected and unaffected speeches in Figure A8. Here we see the words associated with farmers and manufacturing, jobs and income, and business and companies all associated with speeches from Districts that experienced substantial trade-related layoffs. Meanwhile unaffected Districts that referenced this topic put more emphasis on tax-payers and the public benefits associated with repealing certain trade-related bills.

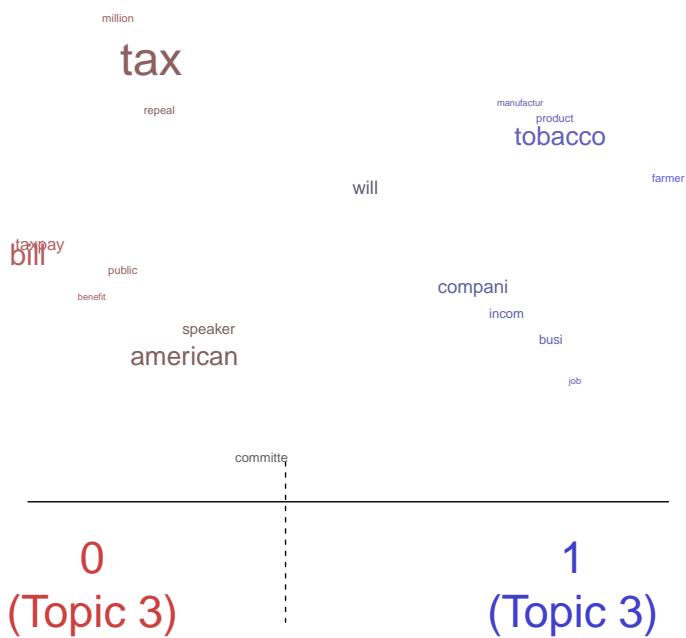


Figure A8: Word-strength associated with topic 3 (“trade deficits”) discussed by Representatives from affected (right on the x-axis) and unaffected (left on the x-axis) Districts. Placement on the x-axis indicates association of the word with speeches from unaffected and affected Districts with the vertical dashed line indicating an equal split across speeches. Word size indicates strength of association.