How Are Workers Compensated Following Trade Liberalization?

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Abstract

How do workers cope with the adjustment costs from trade liberalization? Governments' ability to deal with the distributional consequences of lifting trade barriers has become one of the key challenges facing developed democracies. Recent findings have shown how among workers harmed by liberalization, some turn to dedicated government training programs, while others fall back on disability payments and early retirement. These choices largely determine the odds of an individual returning to work, so what explains the variation? We demonstrate how in the US, the politically fraught nature of Trade Adjustment Assistance (TAA), combined with its administrative complexity, means that individuals are prone to elite framing effects. We use roll-call votes and legislators' floor speeches on TAA to measure their attitudes towards trade adjustment, and proxy for the demand for trade adjustment by using economic shocks from Chinese import competition. We find that when legislators express negative views of the program, individuals in their districts become less likely to petition for, and receive, trade adjustment benefits. This, in turn, appears to render them more likely to fall back on other transfers, such as disability payments, which are less likely to get individuals back to work.

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1 Introduction

How do workers cope with the adjustment costs from trade liberalization? Continued economic integration between countries may well depend on the answer to this question. Developed countries are increasingly fielding backlash against trade liberalization that is seen as benefiting some at the expense of others. The costs of adjustment to import competition, largely overlooked in general equilibrium models, are growingly manifest. A series of studies have found links between import exposure and an anti-incumbent bias, the adoption of authoritarian values, the emergence of populism, political extremism, and even a rise in what some have called "deaths of despair."[1] Among the instigators of this debate are the findings in Autor, Dorn and Hanson (2013), which show a far longer and more painful adjustment to Chinese imports in the US than advocates of trade liberalization had assumed.

The fundamental problem is a familiar one: trade is generally thought to increase the size of the pie, but in the short term, some are left with a smaller slice; the disruption this occasions is costly. Trade theory has a ready solution: given the magnitude of gains from trade, governments ought to be able to liberalize and redistribute the gains, in a way that leaves everyone at least as well off as they were prior to liberalization. This is, in fact, the premise of embedded liberalism, namely that international openness can accommodate a range of domestic social purposes and associated institutions.[2] But countries vary in the extent to which they seek to achieve such redistribution. In the United States, one government program is specifically designed to address labor dislocation resulting from trade liberalization: Trade Adjustment Assistance (TAA).[3] Put in place in 1962 by President Kennedy, TAA provides trade-impacted workers with income support, health coverage, and relocation assistance while they complete training to re-enter the workforce, often in a different industry.

TAA thus ought to be the means of reconciling two conflicting government objectives: reaping the benefits from trade, while mitigating its distributional effects, and thus decreasing opposition to trade liberalization in the first place. But of late, TAA has increasingly been getting bad press. Conservative bodies like the Heritage Foundation have long called for the "ineffective and wasteful program" to be left to expire. But even traditional champions of the program, from the Brookings Institution to the International Monetary Fund (IMF) and the *Economist* magazine, have called for its wholesale reform. The findings in Autor, Dorn and Hanson (2013) have played

[1] Margalit 2011; Autor et al. 2016; Ballard-Rosa et al. 2017; Case and Deaton 2015.
[2] Ruggie 1982.
[3] Other countries feature analogous programs, like the EU's European Globalization Adjustment Fund (EGAF).

a central role in this change of heart. Brookings points to these findings as the main piece of evidence for the program's inadequacy: "most trade-displaced workers end up relying on Social Security and disability benefits, rather than the retraining resources provided by TAA, as they try to move forward."[4] In a recent joint report, the IMF, the World Bank, and the WTO all point to the same evidence and draw the same conclusions.[5]

Autor, Dorn and Hanson's findings are indeed arresting. While import exposure does trigger government transfers through TAA, these increases are barely statistically significant, and they are dwarfed by transfers received through disability benefits and early retirement. This is bad news, since as opposed to TAA, neither of those transfers gets individuals back to work—most disability recipients, in particular, stay on the program for the rest of their lives.[6]

In the present article, we revisit Autor, Dorn and Hanson (2013)'s findings about trade compensation, which leads us to an entirely new puzzle. To calculate the effect of import exposure on TAA transfers, Autor, Dorn and Hanson use state-level TAA budgets, and allocate these to commuting zones (CZs) in proportion with unemployment payments. This is a useful first approximation, but a problematic one: the way by which unemployment versus TAA payments are allocated differs, and while the latter is specifically targeted towards trade dislocation, the former is not. To address these shortcomings, we rely instead on petition-level data for the program's duration, obtained through a Freedom of Information Act request. We use the addresses found in each petition to assign these to commuting zones. When we re-estimate the effects of trade exposure on levels of TAA transfers, our results differ markedly. Specifically, using the petition-level data, we find that the magnitude of that effect is between 1.7 and 3.3 times greater than in Autor, Dorn and Hanson's results.

The first implication of this difference is that the responsiveness of TAA to trade shocks appears to be higher than has been portrayed, and thus some of the hand-wringing over the program's ineffectiveness may be undeserved. But secondly, the discrepancy between the two estimates is itself puzzling. How is the allocation of unemployment payments and TAA funds so different? Digging deeper, we find that trade compensation is distributed very unevenly; some areas see far more TAA pickup than others in reaction to trade shocks of the same magnitude. Why is this? The answer, we argue, goes back to the political contention over TAA.

[4] Mark Muro and Joseph Parilla. 2017. "Maladjusted: It's Time To Reimagine Economic 'Adjustment' Programs." Brookings Foundation.

[5] "Making Trade an Engine of Growth for All: The Case for Trade and for Policies to Facilitate Adjustment." IMF, World Bank, World Trade Organization. April 2017.

[6] Autor and Duggan 2003.

Because TAA relies on individuals, unions, or firms to petition for relief, and because the process is complicated, it relies on a degree of mobilization, and it is prone to informational effects. Not all eligible workers apply; far from it. As *The Economist* magazine recently put it, "The [TAA] scheme can be confusing and administratively complex. Worse, most Americans have not heard of it."[7] We posit that the design of TAA, specifically the way it relies on mobilization on the part of workers in a low information-environment, inserts politics back into the equation. When elites voice a dim view of trade adjustment, most often on ideological grounds, individuals who lose their jobs to import competition are less likely to have heard of TAA, and less likely to think of it as a program through which they can successfully obtain support.

In other words, we argue that political views on trade compensation are in part self-fulfilling. When faced with administratively complex measures in the midst of difficult circumstances, workers fall prone to the framing effects generated by the political climate they find themselves in. While TAA is meant to be an apolitical mechanism, we demonstrate that its effectiveness depends in large measure on the political environment it operates in.

We go further, looking at the effects of elite attitudes towards TAA on *other* government transfers. As Autor, Dorn and Hanson (2013) demonstrate, areas hit by trade shocks see a large increase in the pickup rate of disability payments. We reason that these individuals fall back on disability insurance because of a lack of alternatives. In these cases, the provision of trade adjustment should act as a substitute, and one with far-reaching consequences, since trade adjustment benefits are by construction temporary, while disability benefits are often long-lasting. Elite attitudes about trade adjustment may end up having unintended spillover effects on other transfers like disability insurance, ultimately creating greater dependence on the state.

To test these beliefs, we code the attitudes of legislators towards TAA using two indicators: a tally of all the roll-call votes on bills concerning the TAA program; and a record of all Congressional speeches that relate to TAA, on which we run a sentiment analysis. We then use these measures to explain the volume of TAA petitions in a given area in reaction to trade shocks.The findings support our contention: districts where elites hold more negative views of trade compensation see fewer overall petitions, even within political party. Tellingly, this effect is most pronounced for petitions initiated by workers (as opposed to unions or firms themselves), who are most likely to be affected by variation in the information environment. Exploiting the exogenous variation in the congruence between media markets and congressional districts, we also find that the effects

[7] *The Economist*. Jun 29th 2017. "America's Programme to Help Trade's Losers Needs Fixing".

are stronger in high information environments, where workers get more information about their legislators. We further probe the informational mechanism by looking to Google searches. Search patterns of topics relating to TAA suggest that individuals in locations with pro-TAA legislators are more aware of the program, and more likely to seek further information. We run a placebo test on searches relating to social security to ensure that we are not simply picking up demand for all support programs.

In sum, the design of trade adjustment in the US makes it prone to information effects that operate along ideological lines. As a result, estimates that allocate TAA budgets by a proxy like unemployment payments likely underestimate the program's responsiveness to trade shocks. This is what we find when we re-estimate Autor, Dorn and Hanson (2013) using petition-level data. But this leads to a natural question: why is TAA distributed so unevenly—that is, why do areas facing the same magnitude of trade shock see different levels of trade compensation? The answer is politics. The politically fraught nature of TAA, combined with its administrative complexity, means that individuals are prone to elite framing effects. When legislators express negative views of the program, individuals in their districts become less likely to seek, and receive, trade adjustment benefits. This, in turn, appears to render them more likely to fall back on other transfers, such as disability payments, which are less likely to get individuals back to work.

2 Reassessing Responsiveness of TAA to Trade Shocks

Developed democracies have been contending with mixed records in cushioning domestic populations from the distributional effects of liberalization. Since WWII, OECD countries have committed to progressively more international liberalization, entailing considerable domestic adjustment. But the provision of mechanisms intended to assist in that transition varies significantly from state to state, and across time. An emerging view asserts that the United States' ineffectiveness in dealing with the domestic challenges posed by international liberalization partly accounts for its recent change of heart over the very system of global economic governance that it helped found.

The main federal mechanism designed to help the US labor force adjust to liberalization is called Trade Adjustment Assistance. Despite being a billion-dollar federal program, the consensus is that TAA is falling short of its task. Even traditional champions of the program have called for its wholesale reform. The evidence these critics rely on overwhelmingly points to one recent study: Autor, Dorn and Hanson (2013). The Brookings Foundation, the IMF, the World Bank, and the WTO all point to the same findings about the low response of TAA to trade shocks as

evidence that the American trade adjustment mechanism should be redesigned.[8] This single study has become, more broadly, the focal point in the debate around the ongoing backlash against trade liberalization.

Autor, Dorn and Hanson (2013) carefully measure the long-run effects of regional exposure to US imports from China. They find that those areas with industries most exposed to Chinese imports have seen depressed wages for longer than most observers anticipated. A key part of the explanation is related to what government transfers are activated in those areas. While regional exposure to the China trade shock is weakly related to increased TAA benefits, it appears to bear a more statistically significant relation to an increase in disability benefits. Substantively, the effect of TAA pickup in dollar terms is also dwarfed by transfers received through disability benefits and early retirement: an increase of $1000 in per-worker exposure to Chinese imports translated into an additional $0.23 per capita in TAA benefits, vs. an additional $8 in disability benefits.

As a first step, we revisit Autor, Dorn and Hanson (2013)'s findings and take a closer look at these estimates. The authors calculate TAA payments using state-level budgets, which they allocate to CZs, their geographical unit of analysis, in proportion with unemployment payments. The assumption, which sounds *prima facie* plausible, is that these two forms of benefits will be allocated in similar fashion in response to the same trade shock. But we know the two programs operate on a different premise: TAA is targeted in a way that unemployment benefits are not. Trade adjustment benefits are only extended to workers who are trade eligible, and who successfully demonstrate this through a petition process. In other words, the particularity of TAA is that it relies on significant mobilization on the worker side. And compared to unemployment insurance, the TAA program imposes a far greater administrative burden on applicants: the petition process, which requires a minimum group of workers and cannot be initiated by an individual worker, must demonstrate that the job loss was directly related to trade, either owing to an observable surge of imports, or the explicit offshoring of labor.[9]

One initial implication of this is that unemployment benefits, which are paid out in a far more automated fashion to Americans who have been laid off, will be an imperfect proxy for TAA

[8] *The Economist*. Jun 29th 2017. "America's Programme to Help Trade's Losers Needs Fixing". Mark Muro and Joseph Parilla. 2017. "Maladjusted: It's Time To Reimagine Economic 'Adjustment' Programs." Brookings Foundation. "Making Trade an Engine of Growth for All: The Case for Trade and for Policies to Facilitate Adjustment." IMF, World Bank, World Trade Organization. April 2017.

[9] A useful parallel can be drawn to the study of trade remedies, where an investigation requires proving that an *industry* has been injured because of an import surge. So burdensome is this administrative requirement, that scholars differentiate between countries that have the legal capacity to put it in place and those that do not (Kucik and Reinhardt, 2008).

transfers, in a way that will affect estimates of TAA pickup in the wake of trade shocks. A better proxy for CZ-level TAA payments is one based on the number of actual petitions filed in a given CZ. Next, we describe in greater detail how we use individual petitions to construct such a measure of regional trade adjustment benefits.

2.1 Measuring Trade Compensation

Our measurement of trade compensation relies on individual TAA petitions. To be eligible for TAA benefits, a worker must demonstrate to the Department of Labor (DOL) that (i) a significant number of workers in the firm have become or are threatened to become totally or partially laid off; and (ii) imports or a shift in production to a foreign country are a major factor contributing to these layoffs and to a decline in sales or in production. The DOL reviews each application and determines eligibility.

We obtained all TAA applications made between 1990 and 2007 through a Freedom of Information Act Request. Excluding petitions filed in Alaska and Hawaii for which CZs are difficult to define, the dataset includes 36,646 petitions covering 3,225,421 workers. Each petition includes information about the name of the employer, the petitioner (e.g. union, state one-stop center, or workers), the address of the workplace, the application and determination date, the estimated number of affected workers, and the certification status.[10] Using the address information, we geocode each petition to a latitude and longitude coordinate and build aggregate-level datasets at the CZ-level and at the CZ-by-district level.[11] A petition sometimes covers multiple locations within a state, and does not include specific address information (e.g. the address states "all locations throughout the state"). In such cases (3.3% in the dataset), we distribute them to our geographical units according to their share of petitions within a state.

Applying for the eligibility certification is only the first step toward receiving benefits. Once certified, workers can apply for the specific program benefits (e.g. full-time training with income support, or wage supplements that kick in if workers accept new employment at a lower wage). The actual payment for the TAA program is observed at the state-level, and not available at our

[10] The pattern of TAA applications by the type of petitioner in 1990-2007 is described in the appendix Section A1.2.

[11] We used Texas A&M Geocoder's Geocoding API and Google Maps Geocoding API. These algorithms can correct misspellings in the address information and return an approximate latitude and longitude coordinate for this address. The two APIs use different algorithms and return different coordinates, but they are matched to the same county and the same district in 96.1% of cases. In the remaining cases, we match each location to a county using the location-name-to-county crosswalk, and choose the one between the two coordinates that is matched to this location-name-based-county-match.

geographic unit of analysis. We thus allocate state-level TAA budgets to our units in proportion to the number of TAA petitions and estimated affected workers.[12] This approach is similar to Autor, Dorn and Hanson (2013), who apportion the state-budget in proportion to unemployment payments, but improves on their measure by incorporating a direct measure of TAA distribution that accounts for variation in petitioning for TAA.

2.2 Measuring Import Exposure

We employ the measure of import exposure per worker derived by Autor, Dorn and Hanson. By leveraging geographical variation in industry specialization and national-level variation in Chinese imports in the industry, they capture the exogenous shock from China to the local economy. Specifically, they measure the exposure to import competition in the local market as the average Chinese imports to the CZ per worker, weighted by each industry's share in the CZ's employment.[13]

One potential issue with this measure is that realized Chinese imports to the United States might be correlated with product demand in the United States. To address this, we exploit a unique characteristic of the Chinese economic growth as elaborated in Autor, Dorn and Hanson (2013). In short, a rapid growth in Chinese imports is largely driven by the increasing competitiveness of manufacturers in China and its accession to the World Trade Organization in 2001, which resulted in increasing Chinese import exposure to other economies as well. This allows us to estimate the causal effect of Chinese imports shock isolating the demand-side factors. We instrument for Chinese import penetration to the US using import exposure of eight other developed countries.[14]

Throughout the analysis, we focus on the level of Chinese import exposure per worker in the US as the main indicator for import penetration. Autor, Dorn and Hanson (2013) calculated

[12] We use the state-level TAA budget data from Autor, Dorn and Hanson (2013), which is only available for 1990, 2000, and 2007. For other years, we interpolate values from the two nearest years.

[13] The level of import exposure per worker is defined as follows:

$$IPW_{uit} = \sum_j \frac{L_{ijt}}{L_{ujt}} \frac{M_{ucjt}}{L_{it}}.$$

In this equation, the ratio of L_{ijt} to L_{ujt} indicates the industry specialization of the CZ. This denotes the share of employment in industry j in the CZ i in the time period t in the United States, indicated by u. The import penetration from China (c) to the United States (u) in industry j in the period t is indicated as M_{ucjt}. This is divided by the total employment in the CZ (L_{it}), as our interest is in import exposure per worker in the CZ.

[14] We instrument Chinese import penetration to the US with a non-US exposure variable defined as:

$$IPW_{oit} = \sum_j \frac{L_{ijt-1}}{L_{ujt-1}} \frac{M_{ocjt}}{L_{it-1}}$$

where employment-levels are lagged by ten years and realized imports from China to other markets (M_{ocjt}) is included instead of imports to the US (M_{ucjt}). Autor, Dorn and Hanson (2013) construct the measure focusing on eight other developed countries: Australia, Denmark, Finland, Germany, Japan, New Zealand, Spain, and Switzerland.

the measure for 722 CZs in the United States for 1990, 2000, and 2007, and estimated the long-run local market effects of ten-year change in trade shock.[15] While their interest is in the long-run labor market effects, our analysis is interested in exploring yearly changes in TAA applications, which leads us to focus on the level of import exposure in a given year, instead of the ten-year change. We take the 1990 import exposure measure for the 1990s and the 2000 measure for the 2000s.

2.3 Results: TAA Responsiveness

We re-estimate the Autor, Dorn and Hanson (2013) results by employing our petition-based measure of TAA payments instead of their proxy based on unemployment payments. Otherwise, we hew closely to their approach: we are examining the effect of economic shocks from Chinese import competition, instrumented by non-US exposure to Chinese import penetration. And as in their case, we control for employment in manufacturing, college-educated population, foreign-born population, employment among women, and employment in routine occupations as percentages of the population along with average offshorability index of occupations.

Table 1: TAA Responsiveness to Chinese Import Shock

	(1)	(2)	(3)	(4)
	ADH	Petition-Based Measure		
		Petitions	Workers	Certified Workers
Panel A: Ten-Year Equivalent Change in Payments				
Import exposure per worker	0.234	0.401^{+}	0.395^{*}	0.397^{+}
	(0.174)	(0.209)	(0.197)	(0.236)
Panel B: Level of TAA Payments in 1990 and 2000				
Import exposure per worker	0.244^{*}	0.645^{**}	0.594^{**}	0.811^{**}
	(0.106)	(0.182)	(0.169)	(0.236)
Decade FE	Yes	Yes	Yes	Yes
Observations	1444	1444	1444	1444

Robust standard errors clustered on states in parentheses

$^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$

We begin by replicating their original finding. In their study, they focus on the long-run effects of import penetration. The dependent variable is the ten-year-equivalent change in TAA payments, and the independent variable is the ten-year equivalent change in Chinese import expo-

[15] They focus on the change between 2000 and 2007 because of the negative effects of the Great Recession.

sure.[16] Their analysis covers 722 CZs and focuses on the two decades from 1990 and 2007. Table 1 presents the results. The first column in panel A replicates their estimate on the import shock effects on TAA payments. An increase of $1000 in per-worker exposure is estimated to lead to $0.23 per capita in TAA benefits, but the coefficient does not appear to be statistically significant. In columns 2-4, we estimate the same models but using our measure of TAA payments. We apportion the state-level TAA payments to CZs based on the number of petitions filed (column 2), the number of affected workers included in the petitions (column 3), and the number of affected workers in the certified petitions (column 4).[17] The import shock now appears statistically significant throughout, and TAA payments appear to be substantially more responsive than initially estimated. The estimate can be translated into $0.40 per capita in TAA benefits, which is 1.7 times larger than the original estimate.

We then estimate the models focusing on the level of import exposure per worker and the level of TAA payments in the beginning of the two decades: 1990 and 2000. The results presented in the panel B of Table 1 show a similar pattern, but the substantial effects of import shock on TAA responsiveness appear larger than in panel A. The estimate using Autor, Dorn and Hanson's measure is $0.24, which is similar to the original estimate, but the estimates using our petition-based measure ranges from $0.59 to $0.81 for every $1,000 increase in import exposure. In particular, the effects using certified petitions appear to be more than 3 times larger than Autor, Dorn and Hanson's estimate. In sum, the findings suggest that TAA allocations are more responsive to trade shocks than previously thought.

Just as importantly, the estimates reveal a considerable discrepancy between unemployment payments and trade compensation, which highlights the key difference between the two programs: TAA requires information and mobilization, while unemployment insurance is distributed to individuals in a more automatic fashion. We further explore the implication of this discrepancy by examining the variation in the responsiveness of TAA pickup to trade shocks. Why does the same trade shock lead to more trade adjustment benefits in some places than others?

Figure 1 shows the extent of this variation in TAA responsiveness across CZs in the 1990s and 2000s. We calculate the responsiveness of TAA pickup to trade shocks as the percentage of affected workers included in the TAA petitions divided by the level of import exposure per worker.

[16] Ten-year equivalent change is calculated as the difference between the value in 1990 and 2000 for the first decade, and the difference between the value in 2000 and 2007, multiplied by 10/7 for the second decade.

[17] In apportioning state-level TAA payments to CZs, we calculate the proportion of petitions or number of affected workers in CZ based on petitions filed in the two-year period (the year of observation and the following year). For the 1990 TAA payments in CZ, the state-level budget is apportioned based on the petitions filed in 1990 and 1991 due to the absence of information for 1989.

In this way, a score of 1 indicates that 1 percent of the workforce petitioned for TAA petitions per $1,000 of per-worker import exposure. Lower scores suggest a trade adjustment shortfall, and higher ones indicate greater TAA responsiveness.

We calculate this score for each CZ in the two decades. What Figure 1 makes clear is the wide variation in trade adjustment responsiveness across space and time. In the data, the responsiveness score ranges from 0 to 740.2. It is less than 1 for 78.5% of observations. We use quantile-cut point in the legend to represent the variation across regions. Two trends emerge. First, the overall level of responsiveness decreased in the second decade: an increase in import exposure in the 2000s was not matched by a corresponding increase in TAA allocations. Second, TAA pickup in response to trade shock is lower in the central region across both decades, but there is a wide range of variation in responsiveness within all regions. Together, these trends speak to a clear disconnect between the supply of trade adjustment and the need for it.

These descriptive results are consistent with anecdotal evidence. There appears to be a consensus over the fact that as a result of the program's design, petitioning for TAA requires considerable information and a high degree of mobilization. TAA caseworkers, tasked with assisting workers through the petitioning process, speak to the complexity of the bureaucracy involved. As one such TAA caseworker from Indiana described it, TAA can be the opportunity of a lifetime, but "they [laid off workers] have to want it."[18] And wanting it may not be enough, if workers aren't aware of the program's existence. As the *Economist* magazine put it, "most Americans have not heard of [TAA]."[19] A labor liaison to the AFL-CIO that we spoke to confirmed that when it comes to trade adjustment, "people don't know what they don't know," and recounted cases of workers who were in retraining programs without realizing that they would have been TAA-eligible, and might have gotten US $20,000 in income support during their retraining.[20]

As a result of the program's bureaucratic complexity, state governments, especially, have sought to provide a range of services that assist workers in getting through this process. But these programs vary a great deal from state to state. The National Employment Law Project puts it bluntly, directly linking bureaucratic complexity and regional variation: "Inconsistent and overly technical administration by the U.S. Labor Department and neglect or lack of experience in many states impedes those certified for TAA from taking full advantage of its features."[21] Along the same

[18] Cited in: "Aid for Trade". July 1st 2017. *The Economist*.

[19] ibid

[20] Interview materials with authors.

[21] "Getting Certified for Trade Adjustment Assistance: A Guide for Unions, Workforce Agencies, and Community Groups". 2005. National Employment Law Project and International Union, UAW. p. 2.

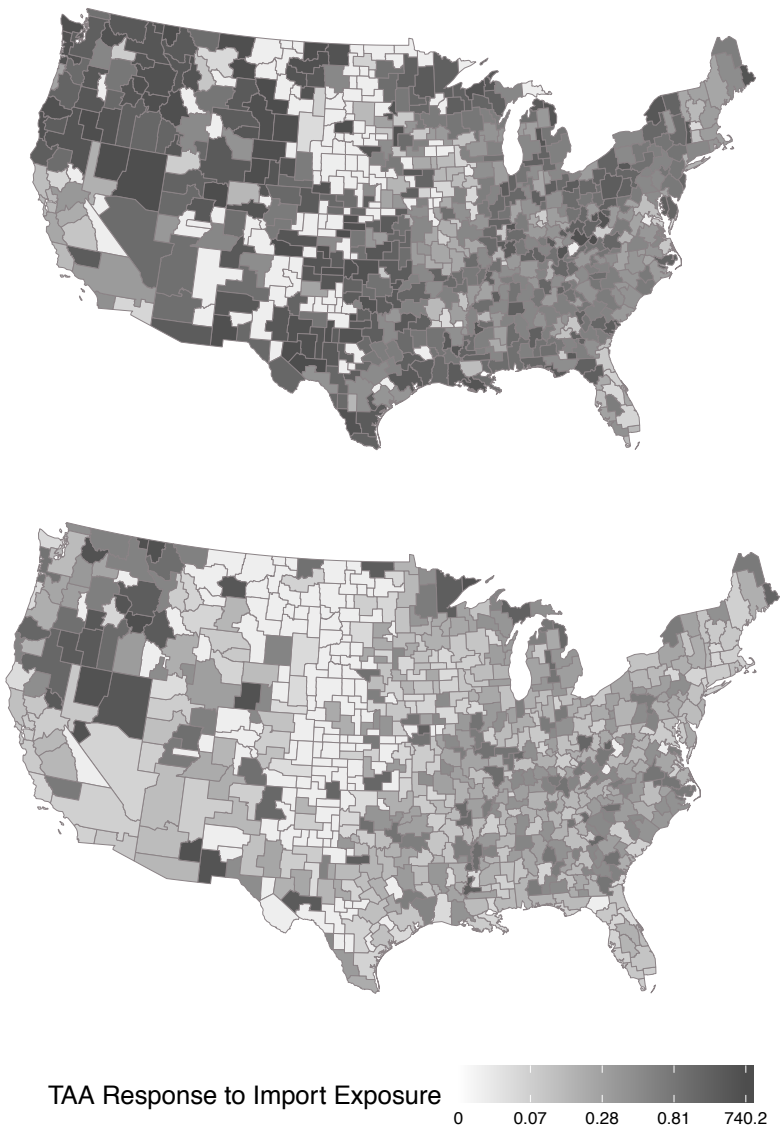

Figure 1: TAA Petitioners by Import Exposure per Worker in the 1990s (top) and 2000s (bottom)

lines, one TAA-eligible worker at a Maytag factory testified to Congress:

> "Maneuvering through the Trade Adjustment Act and other programs can be like entering a bureaucratic minefield. [...] The result is that programs are *not always uniformly implemented from one area to another* or even within the same area."[22]

We are interested precisely in this regional variation. What might explain why some areas see greater TAA pickup in reaction to the same trade shock than other areas? TAA is targeted

[22]Emphasis added. Statement by David Lee Bevard, "How Effective Are Existing Programs in Helping Workers Impacted by International Trade?" Monday, March 26, 2007, U.S. House of Representatives. Committee on Education and Labor. Washington, DC. p.7

towards all workers who have lost their job as a result of trade liberalization, but we know that most trade-eligible workers never even petition for it. As we put forth in the next section, the answer rests on the political climate surrounding TAA. We expect that the odds of being among those who do benefit from the program are a reflection of a region's political ideology. The required mobilization inherent in the design of TAA reinserts politics into a mechanism which is meant to be apolitical. The next section further advances and tests this argument.

3 The Political Geography of Trade Adjustment

TAA represents a political compromise, and this has effects both on its design and its outcomes. Republicans often question its purpose, while Democrats would like to see a broader set of measures to support all workers who have lost their jobs, whatever the proximate cause. Back in 1962, TAA was put forth as an integral part of the Trade Expansion Act, and while it remains a program with traditional bipartisan support, what both sides of the aisle see as its second-best character makes it vulnerable to horse-trading. As Burgoon and Hiscox put it, "[TAA] tends to be extremely popular in theory (among voters as well as among scholars), but difficult to establish and maintain in practice."[23]

Within the US, the political debate over the very need for TAA has never ceased. Some argue that governments have a responsibility to ensure that those negatively affected by federal trade policy be compensated for changes that they had no part in. Others claim that because liberalization amounts to a roll-back of special favors to vested interest groups, no compensatory measure is required.[24] The difference in opinion comes down to beliefs about what is being righted: the labor dislocation resulting from federal trade policy, or rent-seeking protection that liberalization lifts in the first place.

Beyond this ideological divide, TAA has proven highly prone to legislative vote trading. Republicans have threatened to block trade agreements they otherwise supported with South Korea, Panama and Colombia over the TAA benefits tied to those agreements, which they considered overly generous. Democrats, in turn, have themselves voted against TAA when trying to derail the delegation of "fast track" trade authority to the President. As for labor unions, while they support TAA on its face, they regularly push back against it, since they see it as facilitating the move of workers to less unionized industries. In other words, support and condemnations of the program

[23] Burgoon and Hiscox 2000, 3.
[24] CATO Institute. Sallie James. "The Flawed Logic of Trade Adjustment Assistance." June 2 2011.

are often strategic, and linked to other issues.[25]

In the face of such disagreements, the emergence and continued existence of TAA is the reflection of pragmatic concerns that cut across ideology. The overarching purpose of trade compensation is to decrease domestic opposition to trade agreements. Because import-competing groups tend to be politically powerful, governments find it necessary to extend some credible promise of compensation to ratify trade deals. In this way, findings show that Republican legislators, traditionally opposed to government assistance programs, tend to support TAA programs when a large portion of their constituents stands to gain from trade.[26]

Our central theoretical expectation is that the variation in the distribution of TAA benefits in reaction to the same trade shock is driven by elites' political attitudes towards trade adjustment. When legislators hold a dim view of trade adjustment, we expect that workers in that legislator's district will be less likely to know about the program's existence, and less likely to successfully jump through the required hoops to secure benefits. Consider Congressman Doug Lamborn of Colorado's fifth district, who has claimed, "this bloated, wasteful, and unsuccessful program is a budget-busting handout designed to placate union activists. Chicago-style politics like this has no place in any open and straightforward trade negotiations, and that's why I opposed TAA."[27] We expect that laid-off workers in districts like Congressman Lamborn's are less likely, all else equal, to successfully avail themselves of the benefits of TAA. Negative elite attitudes act as a deterrent to mounting a petition in a complex application process. These districts are also less likely to invest in resources to assist eligible workers in obtaining the benefits they may be due. In the words of the National Employment Law Project, "Inconsistent and overly technical administration ... and neglect or lack of experience in many states impedes those certified for TAA from taking full advantage of its features."[28]

Indeed, beyond framing beliefs about the effectiveness of trade-compensatory programs, political elites can also play a more direct role in the process of trade adjustment. As one manual for TAA applicants puts it, "The participation of members of Congress can influence employers, local officials, and others to assist petitioners in obtaining supporting information for TAA certification." As a result, that same manual suggests to applicants, "consider giving your U.S. Representative and Senators notice when filing TAA petitions."[29] This type of coordination can prove crucial

[25] Burgoon and Hiscox 2000.
[26] Rickard 2015.
[27] Press Release, Jun 12, 2015. "Opposing TAA (Trade Adjustment Assistance) and Increasing Trade Transparency."
[28] NELP TAA Manual, 2.
[29] NELP Manual 2005.

to workers. For instance, the former Congressman Paul Hodes of New Hampshire's 2nd district announced the approval of TAA for laid-off workers at the Groveton Mill by noting that he "wrote to Labor Secretary Elaine Chao and requested a swift approval of the TAA application." He also provided detailed information about the program benefits and encouraged workers to call his office for assistance.[30] Politicians can thus play a direct role in supporting petitions for relief, as well as encouraging workers to apply for TAA. This kind of support becomes more likely when the Representative or Senator in question is a champion of TAA, rather than an opponent of the program. In sum, we argue that the main US program seeking to provide trade adjustment is highly vulnerable to framing by political elites. The more negative the view, the less likely individuals will know about, and petition for, TAA benefits.

3.1 Measuring Elite Attitudes

To capture these effects, we bring politics into the equation: we measure legislators' views about trade adjustment, and test their effect on the rate of TAA petitions in the face of trade shocks. Our analysis employs the same instrumental variable approach as above, but our primary explanatory variable of interest is now legislative attitudes towards TAA. We take CZ-by-district as our geographical unit of analysis: Chinese import penetration is measured at the CZ level, while congressional districts are the key political geographical unit that we are interested in. Using this geographical unit allows us to zero in on the effects of different political climates on TAA applications within the same CZ. In other words, we keep the economic shock constant, but vary the political environment.

We measure elite attitudes toward trade compensation with roll-call voting records and floor speeches, using all House votes on TAA between 1990 and 2007. We only include major roll-call votes that are consequential to the direction of the policy, excluding procedural votes. Following Rickard (2015), we consider roll-call votes that are specific to TAA in order to isolate legislators' positions on TAA. Roll-call votes on trade or appropriations bills that are only partially relevant to TAA are left out.[31]

Four TAA-relevant roll-call votes in the House took place during this period, as shown in Table 2. Only one roll-call was targeted to reduce funds appropriated for TAA (the vote on the amendment for H.R.2267 in the 105th Congress). Legislators' votes for (against) this amendment

[30] Press Release, Nov. 27, 2007. "Hodes Announces Trade Adjustment Assistance for Groveton Mill Workers."

[31] For instance, we exclude roll-call votes on the Reciprocal Trade Agreement Authorities Act of 1997 (HR2621) and the American Recovery and Reinvestment Act of 2009 (HR1).

are considered as anti-TAA (pro-TAA) stance. Abstentions are considered as missing. The other three roll-calls were to reauthorize the program or increase funding for it. Votes for (against) these bills or amendments are considered as pro-TAA (anti-TAA) stance. As roll-call votes on TAA are often bundled with other issues, we have a limited number of TAA-specific roll-call votes. Our analysis is necessarily limited to the period of congressional sessions for which we have information on legislative preferences over trade compensation.

Table 2: Roll-Call Votes on TAA, 1990-2007

Congress	Vote Date	Bill	Vote No.	Summary	Results
105	Sep-25-1997	H.R.2267	455	On the amendment to reduce funds for TAA program by $90 million	Failed (107-305)
106	Jun-22-2000	H.R.4690	316	On the amendment to increase funding for TAA program by $49.5 million.	Failed (128-284)
107	Dec-6-2001	H.R.3008	477	To reauthorize the TAA program under the Trade Act of 1974	Agreed to (420-3)
110	Oct-31-2007	H.R.3920	1025	On passage of Trade and Globalization Assistance Act of 2007	Agreed to (264-157)

We supplement this data with a collection of floor speeches by all members of the House during the same period. We collected all remarks by legislators containing the words "TAA" or "Trade Adjustment Assistance" anywhere in the text. The collected data include 448 speeches delivered by 207 legislators. We classified these speeches into pro-TAA, anti-TAA, and others with a supervised learning technique.[32] Speeches are classified as pro-TAA (anti-TAA) when legislators express explicit support (opposition) for its expansion or reauthorization. In the majority of speeches (64.5%), TAA is only mentioned in passing, which is not included in measuring elite attitudes. Based on this classification, we construct a pro-TAA speech variable, which is calculated as the difference between the number of pro- and anti-TAA speeches in a given congressional session. The pro-TAA spectrum ranges from -1 to 4 in our dataset.

For our dependent variable, we use two measures: the logged number of petitions filed, and the logged number of workers included in the petitions in each CZ-by-district cell in a year. We also estimate the same models using the estimated transfer amounts, as shown in the appendix (Table A4). For legislative attitudes toward TAA, we rely on *Pro-TAA vote* calculated based on

[32]We hand-coded 20% of the collected documents. The rest are machine-coded through three supervised learning algorithms (support vector machine, maximum entropy, and decision trees) using the RTextTools package in R Jurka et al. (2013). When the three algorithms returned a different classification for a given text, we manually reviewed and revised the classification. For details, see Section A2 in the appendix.

roll-call voting records of members of the House, and *Pro-TAA speech* calculated as the difference between the number of speeches classified as pro-TAA and the ones classified as anti-TAA. As the variable *Pro-TAA vote* is only available for the four congressional sessions in which roll-call votes on TAA-specific issues took place, our analysis is necessarily limited to those years for which we can measure representatives' attitudes toward TAA: 1997 to 2002, and 2007-2008. Throughout the analysis, we control for population,[33] and the Democratic candidate's two-party vote share in the previous House election, as a means of accounting for the district's partisanship.

Table 3: Elite Attitudes and TAA Applications

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Petitions				Affected Workers			
Import exposure per worker	0.116**	0.112**	0.046**	0.047**	0.491**	0.471**	0.162**	0.165**
	(0.035)	(0.033)	(0.017)	(0.017)	(0.139)	(0.133)	(0.059)	(0.059)
Pro-TAA vote	0.065**	0.065**	0.062**	0.033^{+}	0.274**	0.283**	0.276**	0.174*
	(0.013)	(0.014)	(0.016)	(0.018)	(0.056)	(0.051)	(0.052)	(0.069)
Pro-TAA speech	0.054	0.054	0.035	0.015	-0.016	-0.014	-0.002	-0.031
	(0.040)	(0.040)	(0.034)	(0.033)	(0.113)	(0.115)	(0.122)	(0.119)
Dem vote share		-0.038	0.027	0.059^{+}		-0.202	0.039	0.204
		(0.052)	(0.037)	(0.035)		(0.198)	(0.134)	(0.127)
Commuting Zone FE	No	No	Yes	Yes	No	No	Yes	Yes
Decade FE	Yes	Yes	Yes	No	Yes	Yes	Yes	No
Year FE	No	No	No	Yes	No	No	No	Yes
Observations	10663	10500	10500	10500	10663	10500	10500	10500

Dependent variable is logged number of TAA applications in columns 1-4, and logged number of estimated affected workers in TAA applications in columns 5-8. All models control for population (logged).

Robust standard errors clustered on state in parentheses

$^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$

Table 3 presents the results. Our dependent variable is the logged number of TAA applications in columns 1-4, and the logged number of estimated affected workers included in the applications in columns 5-8. The findings are consistent with the theoretical expectation that political elites play a significant role in encouraging or deterring petitions for trade adjustment. In all the estimated models, *Pro-TAA vote* appears to be positively associated with TAA applications. Substantively, the regions with pro-TAA legislators are estimated to have 6.5% more applications (column 1), covering 27.6% more workers (column 5). The effects are robust to the inclusion of CZ fixed effects: the implication is that even within the same CZ, a different political environment leads to significant variation in trade adjustment benefits. The inclusion of the instrumented import

[33] We obtained information on county-level population from Charles, Li and Stephens Jr (2017). We aggregate the county-level population to the CZ-by-district level. When counties are divided into multiple districts, we apportion the population into districts based on their population share in different districts in the year of redistricting. We obtained this population allocation information from the Missouri Census Data Center.

exposure variable also amounts to controlling for the objective demand for trade compensation, which addresses the concern about possible endogeneity whereby *Pro-TAA vote* would simply be a response to the demand for TAA applications.

3.2 Testing the Mechanism (i): Who Petitions?

We further evaluate the validity of the informational mechanism. We begin by separating the effect of elite attitudes on TAA applications, according to who the petitioner was. The DOL requires that petitions be submitted by a group of at least three workers, a union official, a state government agency or the company. Among these potential petitioners, we expect workers to be least informed about the existence of trade adjustment programs. Workers would also be least able to collect information about the program, and provide the required evidence of trade impact. Workers may thus be most reliant on the provision of external information, and unlikely to petition without it. In contrast, the other types of potential petitioners—unions, companies, and state agencies—can be expected to be better informed about the program *ex ante*, and have the administrative capacity to file a petition on their own, without encouragement or assistance from local political actors. This distinction allows us to test our mechanism: if elite effects on TAA applications operate in part through an informational mechanism, we should observe more pronounced effects for workers than for other types of petitioners.

To test this, in Table 4, we examine the effects of elite attitudes on petitions according to who initiated them: workers, a union, a company, or a state agency. All models control for *Dem vote share* and population, and include CZ fixed effects and year fixed effects. Columns 1-4 present the results for the logged number of petitions initiated by four different types of petitioners. Columns 5-8 show the same, but for the logged number of estimated affected workers. The coefficient for *Pro-TAA vote* appears statistically significant for worker-initiated petitions (columns 1 and 5) and for state-initiated petitions (column 4). The number of petitions filed by workers is on average 2.6% higher in the districts with pro-TAA legislators than the other districts. Similarly, the number of petitioning workers is on average 10.3% higher in the pro-TAA districts than the others. We also see a higher number of state-initiated petitions in these districts, although the magnitude of the effect is smaller (1.1% higher on average). The implication is that pro-TAA legislators can also play a direct role by encouraging state government agencies to facilitate TAA applications.

Again, the robustness of findings to the inclusion of CZ fixed effects underscores the importance of political environment in explaining the pattern of TAA allocation, even for areas that

are within the same economic geography. *Pro-TAA speech* also appears to have some additional positive effects on TAA applications, but the coefficient is inefficiently estimated, likely owing to very limited variation on the speech variable, which is also highly correlated with votes.

Table 4: Elite Attitudes and TAA Applications by Petitioners

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Petitions				Affected Workers			
	Workers	Unions	Firms	States	Workers	Unions	Firms	States
Import exposure per worker	0.024*	0.013*	0.026*	0.002	0.090+	0.046*	0.089+	0.005
	(0.011)	(0.005)	(0.012)	(0.003)	(0.053)	(0.021)	(0.051)	(0.013)
Pro-TAA vote	0.026*	-0.002	0.004	0.011+	0.103+	0.012	0.038	0.031
	(0.013)	(0.010)	(0.014)	(0.006)	(0.053)	(0.043)	(0.051)	(0.022)
Pro-TAA speech	0.028	-0.013	0.018	0.009	-0.011	-0.067*	0.042	0.032
	(0.029)	(0.017)	(0.023)	(0.012)	(0.112)	(0.030)	(0.090)	(0.046)
Dem vote share	0.032	0.063**	0.015	0.006	0.118	0.188*	-0.002	0.029
	(0.031)	(0.020)	(0.029)	(0.009)	(0.116)	(0.078)	(0.121)	(0.033)
Commuting Zone FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	10500	10500	10500	10500	10500	10500	10500	10500

Dependent variable is logged number of TAA applications in columns 1-4, and logged number of estimated affected workers in TAA applications in columns 5-8. All models control for population (logged).
Robust standard errors clustered on state in parentheses
$^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$

3.3 Testing the Mechanism (ii): Media Congruence

Next, we test the informational mechanism by exploiting variation in local media environments. Specifically, we examine whether elite effects are stronger when voters are more exposed to information about their legislator's behavior. To do so, we rely on the measure of media congruence developed by Snyder and Strömberg (2010). This measure is based on the geographical match between congressional districts and media markets. As the economic geography of media markets is different from the boundary of congressional districts, voters are exposed to information about out-district legislators as well as their own legislators. The measure for the level of media congruence ranges from 0 to 1, with higher numbers indicating a larger share of in-district news coverage relative to out-district news coverage. If legislators' views have an effect on framing workers' attitudes to trade adjustment, in a way that has an effect on the odds pf petitioning for relief, we would expect to see stronger (weaker) elite effects on TAA applications in districts with higher (lower) media congruence.

We test this expectation by separately re-estimating our baseline models (Table 3) for

districts with high congruence versus low congruence.[34] The results, in Table 5, show a stark difference in the estimated effects of *Pro-TAA vote* according to media congruence. While *Pro-TAA vote* is statistically significant throughout for districts with high media congruence, it is not at all significant in low media congruence districts. Similarly, the substantive effect of *Pro-TAA vote* on TAA petitions is larger in the high information environment (where it ranges from 6.8% to 9.6%) than in the low information environment. As one might expect, the estimated effect in the high information environment is also substantively higher than the average effect across all districts shown in Table 3. In sum, information about legislators magnifies their impact on TAA pickup.

Table 5: Elite Attitudes and TAA Applications by Media Congruence Level

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		Petitions				Affected Workers		
High Media Congruence								
Import exposure per worker	0.070*	0.063*	0.042^{+}	0.039^{+}	0.393**	0.370**	0.189**	0.178**
	(0.027)	(0.027)	(0.024)	(0.023)	(0.098)	(0.096)	(0.070)	(0.069)
Pro-TAA vote	0.096**	0.081*	0.068**	0.088**	0.280**	0.266**	0.285**	0.365**
	(0.034)	(0.033)	(0.022)	(0.030)	(0.089)	(0.091)	(0.070)	(0.108)
Pro-TAA speech	0.051	0.043	0.086^{+}	0.088^{+}	0.065	0.061	0.164	0.182
	(0.085)	(0.078)	(0.052)	(0.049)	(0.245)	(0.238)	(0.158)	(0.156)
Dem vote share		0.152	0.057	0.141		0.032	-0.186	-0.012
		(0.135)	(0.162)	(0.182)		(0.365)	(0.431)	(0.451)
Commuting Zone FE	No	No	Yes	Yes	No	No	Yes	Yes
Decade FE	Yes	Yes	Yes	No	Yes	Yes	Yes	No
Year FE	No	No	No	Yes	No	No	No	Yes
Observations	1997	1972	1972	1972	1997	1972	1972	1972
Low Media Congruence								
Import exposure per worker	0.306**	0.293**	0.155	0.164	1.239**	1.172**	0.538	0.574
	(0.086)	(0.085)	(0.112)	(0.115)	(0.340)	(0.325)	(0.376)	(0.366)
Pro-TAA vote	0.046	0.065	0.008	-0.028	0.064	0.192	-0.120	-0.172
	(0.050)	(0.049)	(0.050)	(0.062)	(0.220)	(0.206)	(0.215)	(0.254)
Pro-TAA speech	0.067	0.066	0.089	0.060	-0.030	-0.029	0.095	0.037
	(0.125)	(0.123)	(0.140)	(0.137)	(0.358)	(0.347)	(0.412)	(0.407)
Dem vote share		-0.154	-0.133	-0.136		-0.865^{+}	-0.756*	-0.737*
		(0.123)	(0.106)	(0.102)		(0.464)	(0.346)	(0.331)
Commuting Zone FE	No	No	Yes	Yes	No	No	Yes	Yes
Decade FE	Yes	Yes	Yes	No	Yes	Yes	Yes	No
Year FE	No	No	No	Yes	No	No	No	Yes
Observations	1103	1075	1075	1075	1103	1075	1075	1075

Dependent variable is logged number of TAA applications in columns 1-4, and logged number of estimated affected workers in TAA applications in columns 5-8. All models control for population (logged).

Robust standard errors clustered on state in parentheses

$^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$

[34] Our data on media congruence measure come from Feigenbaum and Hall (2015) who calculated the decade-average media congruence for each district for the two decades under investigation. Following their approach, we consider districts as high (low) media congruence if the calculated measure is higher than 0.75 (lower than 0.25).

These findings are consistent with our informational mechanism: when individuals receive more news about their legislators, they appear more responsive to their legislator's attitudes toward TAA. But might reverse causality be an issue here? In other words, might it be that legislators become more responsive to their voters' need for TAA where the media environment makes them more accountable to their constituents? While plausible, this seems unlikely for two reasons. First, as discussed above, our estimation effectively controls for voter demand for TAA by including the measure for import exposure per worker. Second, this reverse causality account could not explain why legislators would be more responsive to workers than unions or companies. We further explore this by re-estimating the same models with different dependent variables, based on the four types of petitioners. As presented in Table A5 in the appendix, the effect is once again only substantively and statistically significant for worker-initiated petitions. If the effect were driven primarily by legislators varying their responsiveness according to constituents' information about them, we should not expect a marked difference across different types of petitioners.

3.4 Testing the Mechanism (iii): Web Searches

We conduct a third test to assess the informational mechanism, using patterns of web searches across districts. Our central expectation is that more favorable elite attitudes render workers more aware of the existence of the program in the first place, and thus more likely to apply. We expect that in such districts, workers would be more likely to search for TAA-related information. Consistent with existing work, we take 'knowing what to search for' as an indication of awareness, rather than ignorance (Pelc, 2013). In this way, seeking information related to TAA captures the step prior to putting together a petition. We also run a placebo test on searches related to social security, to ensure that the effect is specific to TAA, and not merely a reflection of overall need.

To test our expectations, we collected city-level data on web-search volume for the keywords "TAA" and "Trade Adjustment Assistance," using Google Trends. We also collected the same data for the keywords "SSDI" and "Social Security Disability Insurance" for the placebo test. The index for search volume ranges from 0 to 100, and reflects the relative importance of a given search in a given area, relative to all searches in that area. All cities that cross the zero-threshold of search enter the data. We take the log of the index as our dependent variable. As the web search data are only available from 2004, our analysis is limited to a single year, 2007, for which we have data on legislative voting. When the city spans different CZs and districts, we aggregate the city-based data to CZ-by-district level by apportioning the data into different cells in proportion to population.

Table 6 presents the results, which provide measured support for our expectations. We present the results for TAA in the first four columns, and for SSDI in the last four columns as a placebo. In the first three models, *Pro-TAA vote* appears to be positively related with TAA-related web-search volume. In the locations where legislators are in favor of the program, the search volume index is on average 13.2%-17.2% higher than other locations. *Pro-TAA vote* loses its significance when we control for *Dem vote share*, but this is likely due to the high correlation of *Dem vote share* with *Pro-TAA vote* in 2007 (bivariate correlation of 0.7). In column 4, we find that a partisan orientation measured by the Democratic candidate's two-party vote share is positively related and statistically significant in accounting for the variation in TAA-related web-search volume. When we rerun the same estimation on variation in Social Security-related searches as presented in the last four columns, we find strictly no relationship. The inferences that can be made on the basis of cross-sectional variation within a single year remain limited, but the results do provide suggestive evidence that elite attitudes are related to an increased awareness of TAA, and appear to generate further information-seeking by individuals.

Table 6: Elite Attitudes and Web-Searches on Government Transfer Programs

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	TAA				Placebo: SSDI			
Import exposure per worker	0.013	0.013	0.001	0.007	-0.035	-0.035	-0.037^{+}	-0.037^{+}
	(0.013)	(0.013)	(0.016)	(0.017)	(0.028)	(0.028)	(0.022)	(0.022)
Pro-TAA vote	0.132**	0.132**	0.172**	-0.049	0.056	0.054	0.068	0.072
	(0.050)	(0.050)	(0.047)	(0.095)	(0.094)	(0.094)	(0.097)	(0.152)
Pro-TAA speech		-0.007	0.006	0.008		0.115	0.115	0.115
		(0.042)	(0.046)	(0.045)		(0.073)	(0.080)	(0.081)
Dem vote share				0.798*				-0.008
				(0.323)				(0.359)
State FE	No	No	Yes	Yes	No	No	Yes	Yes
Observations	1247	1247	1247	1232	1247	1247	1247	1232

Dependent variable is TAA-related web searches in columns 1-4, and SSDI-related web searches in columns 5-8.
All models control for income per capita (logged) and share of college-educated population.
Robust standard errors clustered on state in parentheses
$^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$

4 Spillover Effects: Disability Insurance

Our last theoretical expectation is that the variation in TAA pickup will have an effect on other government transfers. The most disconcerting finding in Autor, Dorn and Hanson (2013) may be the way in which the import shock from China has a disproportionately high effect on disability payments. The implication is that, had it not been for the trade shock, these disability recipients

would be active in the workforce. Disability insurance, by definition, is not designed to get people back into the labor force, and indeed, findings show that most disability recipients never do return to work.[35]

We expect that TAA has a role to play here too. That is, individuals who successfully apply to TAA will have less need for government support through disability payments. As the IMF notes, "Disability benefits [...] likely reflect anxiety-related illnesses affecting displaced workers," adding that "In countries where disability insurance screening is not particularly stringent (US and Northern Europe), these transfers can de-facto become an important form of long-term income support."[36] If a given worker obtains assistance after being laid off, s/he may be less likely to develop such anxiety-related illnesses, and have less need for substitute forms of government support.

As a result, in those areas where the political climate is averse to mobilization for trade adjustment, we expect to see higher levels of disability insurance payments. As trade-impacted workers become less likely to petition for TAA support, they—and their dependents—become more likely to fall back on disability insurance. We expect this will have an observable effect on disability benefits, as one program substitutes for the other. In other words, a tough elite stance on TAA may backfire, creating a greater need for forms of worker compensation that make a return to work unlikely.

We test this expectation by examining the effect of elite attitudes toward TAA on Social Security Disability Insurance (SSDI) payments. If a favorable elite stance on TAA can encourage workers to apply for TAA instead of falling back on SSDI, we should observe a negative effect of elite support for TAA on SSDI. To test for this substitution effect, we calculate *SSDI proportion* as the proportion of SSDI payments over the combined amount of SSDI payments, TAA benefits, and Supplemental Security Income (SSI) payments.[37] All three government benefits are likely driven by a common underlying need for financial support, which in turn is driven by a host of observable and unobservable factors. To get at the substitution effect *between* these different transfers, we focus on the proportion of SSDI over total government transfers. We are interested in how individuals choose between those benefits that are designed to get them back to work, and those that are not. The average proportion of SSDI over total transfers is 15%, but this varies a great deal, in a way that affords us useful empirical traction. As the data on SSDI and SSI payments are available at

[35] Autor and Duggan 2003.

[36] IMF 2017.

[37] SSI is provided to individuals who have never worked or have not worked enough to be eligible for SSDI payments. Among the three programs, SSI accounts for the biggest share of government transfers, followed by SSDI and TAA.

the county-level, we aggregate this data to the CZ-by-district level.[38]

The empirical challenge entailed in estimating this effect is that TAA is a far more targeted transfer than disability insurance. Even assuming a one-to-one substitution effect, whereby all TAA recipients would eschew disability insurance as a result of trade adjustment support, we might still be unable to observe this effect if the number of disability recipients is too large. On the other hand, recall that disability recipients tend to stay on the program for the rest of their lives, as per Autor and Duggan, while the TAA program is limited to two years. The short TAA transfer may have a lasting effect on disability payments, which would cumulate across time, as TAA recipients of the past re-enter the workforce and thus avoid becoming disability recipients for years to come. This cumulation would make the substitution effect more noticeable in any given year.[39]

Table 7: Elite Attitudes toward TAA and Disability Payments

	(1)	(2)	(3)	(4)
Import exposure per worker	-0.003	-0.004^{+}	-0.001	-0.001
	(0.002)	(0.002)	(0.001)	(0.001)
Pro-TAA vote	-0.013**	-0.007**	-0.005**	-0.001
	(0.002)	(0.002)	(0.001)	(0.002)
Pro-TAA speech	-0.003	-0.001	0.000	-0.004*
	(0.004)	(0.004)	(0.002)	(0.002)
Dem vote share		-0.044**	-0.028**	-0.037**
		(0.007)	(0.006)	(0.007)
Commuting Zone FE	No	No	Yes	Yes
Decade FE	Yes	Yes	Yes	No
Year FE	No	No	No	Yes
Observations	10663	10500	10500	10500

Dependent variable is calculated as $SSDI/(SSDI + TAA + SSI)$

Robust standard errors clustered on state in parentheses

$^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$

Table 7 presents the results. We find *Pro-TAA vote* to be negatively associated with the proportion of SSDI payments throughout the estimated models. The coefficient in part reflects an increase in TAA payments resulting from positive elite attitudes, since we are examining the proportion of SSDI over SSDI, SSI and TAA benefits. However, TAA as a whole accounts for less than 0.4% of transfers on average, which cannot account for the magnitude of the *Pro-TAA vote* coefficient. When a legislator is supportive of TAA, we see a substantial decrease in the proportion of SSDI payments, by 0.5-1.3 percentage point.[40] Again, these findings are robust to

[38] As before, we apportion the SSDI payments to different CZ-by-districts in proportion to their population when counties span more than on CZ-by-district cell.

[39] The necessary assumption is that legislative attitudes towards TAA show some correlation across time, which is indeed the case.

[40] We estimate the same models with *TAA proportion* as the dependent variable to compare the magnitude of the

the inclusion of CZ fixed effects and year fixed effects, although *Pro-TAA speech* appears to be more substantively and statistically significant in the last estimated model. This suggests that the political climate variation within a commuting zone is enough to affect behavior.

These findings provide evidence of the purported spillover effects: elite attitudes can sway workers to choose TAA over SSDI payments. By implication, in a political climate unfavorable to TAA, individuals become more likely to fall back on disability insurance, with the attendant consequences on re-entry into the labor market.

5 Conclusion

The politics of trade compensation no longer bear only on the odds of ratifying trade agreements. Labor dislocation resulting from trade has been linked to geographically concentrated unemployment and lower wages. This, in turn, has been linked to a recent rise in populism and anti-immigration sentiment. The United States has arguably chosen to externalize this domestic challenge, by threatening widespread protectionism against its trading partners, in an attempt to directly limit foreign competitive pressure. In so doing, it threatens to splinter the global compact it helped create after WWII.

In the face of this mounting urgency, the main program the US has to deal with trade impacted workers has been heavily criticized, including by its traditional champions. The criticism has focused on the striking findings in one recent study, Autor, Dorn and Hanson (2013). There, the authors show how the governments transfers that rose most significantly in the face of regional trade exposure were not programs like TAA, intended to get individuals back to work, but fallback mechanisms like disability insurance, which lower the odds of individuals ever returning to the labor force.

We begin by taking a closer look at these findings. Autor, Dorn and Hanson lacked a direct measure of regional TAA benefits, so they allocated total state-level TAA budgets to commuting zones in proportion with unemployment insurance payments. While this is a plausible first cut, it ignores the key differences between the two programs: TAA is highly targeted, and relies entirely on workers petitioning for relief and demonstrating that their job was lost to trade competition, whereas unemployment insurance is allocated in a far more automatic fashion. Might this affect estimates of TAA's responsiveness?

effects. *Pro-TAA vote* is associated with an increase in the proportion of TAA payments by 0.1 percentage point, which again implies that the effect on *SSDI proportion* is not entirely accounted by the change in TAA benefits. The results are presented in Table A6.

We find that it does. We collect all individual TAA petitions over a 20-year period, and construct regional variables of the number of petitioning workers at the CZ and CZ-by-district level. When we re-estimate Autor, Dorn and Hanson's models using these petition-level measures of trade adjustment, TAA suddenly appears to be up to 3.3 times more responsive to trade shocks. Some of the hand-wringing over TAA's ineffectiveness thus seems undeserved.

Yet the news is not all good. As we show, the trend across time in the responsiveness of TAA is consistent with the current political situation (see Figure 1): in the face of mounting trade pressure from countries like China, the US' trade adjustment deficiency has *grown*. The shortfall in trade adjustment has increased from the 1990s to the 2000s. The other trend we uncover is the great geographical variation in this responsiveness, with the middle of the country appearing to consistently under-provide trade adjustment benefits, considering the magnitude of trade competition they have been exposed to. Even within coastal states, however, we see considerable regional variation in TAA responsiveness.

What explains this variation? The answer, we argue, is politics. TAA's design and its sheer complexity reinsert politics into what is meant to be an apolitical mechanism. We test this belief by coding legislators' attitudes towards TAA: we collect roll-call data and all speeches concerning trade adjustment over the relevant period. If elite attitudes frame individual knowledge of, and beliefs about, trade adjustment, then legislators' attitudes should be reflected in the rate of petitions, controlling for the magnitude of the trade impact. This is what we find. Legislators' stances on the TAA program have far-reaching effects, significantly affecting the odds of displaced workers successfully applying for trade adjustment benefits. Attitudes towards TAA thus appear to be partly self-fulfilling.

Our belief is that this impact of elites attitudes operates primarily through an information channel: workers in pro-TAA districts are simply more likely to be aware of programs at their disposal, and more likely to seek to use them. We test this in several ways: we find that the effect of elite attitudes is concentrated on worker-initiated petitions, as opposed to petitions initiated by unions or one-stop centers, which are less prone to elite framing effects. We also show that districts with pro-TAA legislative attitudes see more TAA-related web searches, presumably by workers aware of the program, and seeking additional information. Finally, we show that the effect of elite attitudes is greatest in high-media congruence districts, that is, in areas where the media provides voters with most information about their elected officials. Where elite views are most publicized, their views on TAA appear to have the greatest impact on the volume of petitions.

We end by examining whether trade adjustment has observable spillover effects. One of the most arresting findings in Autor, Dorn and Hanson (2013) is the extent to which disability insurance appears to fill in as a government transfer for trade-impacted workers. This is of special concern, given how we know most disability recipients remain on the program and never re-enter the workforce. Might it be that this is a consequence of individuals failing to petition for trade adjustment benefits, and thus turning to second-best transfers? This is exactly what we find: elites' attitudes towards TAA appear to affect the proportion of disability payments relative to total government transfers in an area. In other words, elite attitudes can have unintended consequences. Those opposed to TAA on ideological grounds are often suspicious of individuals' dependence on the state. What our findings suggest is that they may actually be contributing to such dependence by deterring workers from applying for, and receiving, trade adjustment benefits that are more likely to get them back into the labor force than the alternative. This is because the alternative, in this case, is made up of government programs like disability insurance, which fills in when individuals have no other recourse. Paradoxically, then, political elites' opposition to TAA may increase long-term dependence on state benefits in their districts.

Trade adjustment benefits are vulnerable to politics, and this means their allocation across space and time is uneven. The existence of these programs, without political will supporting them, is unlikely to meet the challenge currently facing developed democracies.

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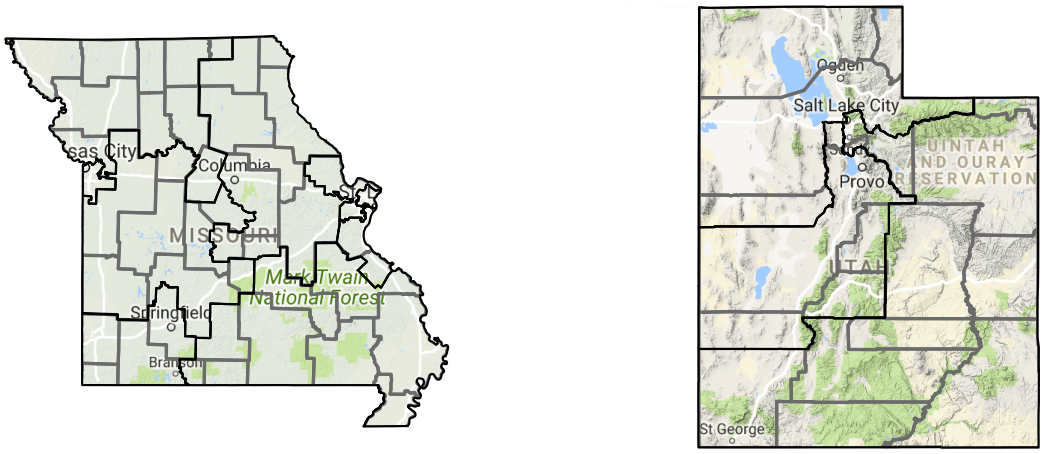
Supplementary Appendix

A1 Data Description

A1.1 Commuting-Zones-by-Districts

Figures A1 and A2 illustrate our main geographical unit of analysis: commuting-zones-by-districts cells. We indicate CZs with gray lines, and congressioanl districts with black lines in the figures. Figure A1 provides an overview for the continental United States. Multiple CZs are sometimes contained within a single district, but they often span across different districts in more populous areas. Figure A2 presents a detailed illustration for the states of Missouri and Utah. Our geographical boundaries for CZ-by-districts change over time with congressional redistricting. Both figures focus on 2007 during the 110th Congress as an example.

Figure A1: Commuting-Zones-by-Districts Cells in the Continental United States, 2007



(a) Missouri

(b) Utah

Figure A2: Commuting-Zones-by-Districts Cells in Missouri and Utah, 2007

A1.2 Trade Adjustment Assistance

We describe the pattern of TAA applications included in our analysis in 1990-2007. On average, 2,036 TAA applications are filed per year. The number of estimated affected workers included in the petitions is on average 188,188 per year. Figure A3 presents the number of TAA applications filed per year from 1990 to 2007, which shows an increasing trend, but with variation over time. Table A1 presents the number of petitions and average number of estimated affected workers per petition. We present the data separately for the two decades and across different types of petitioners, from companies, state agencies, and unions to workers.

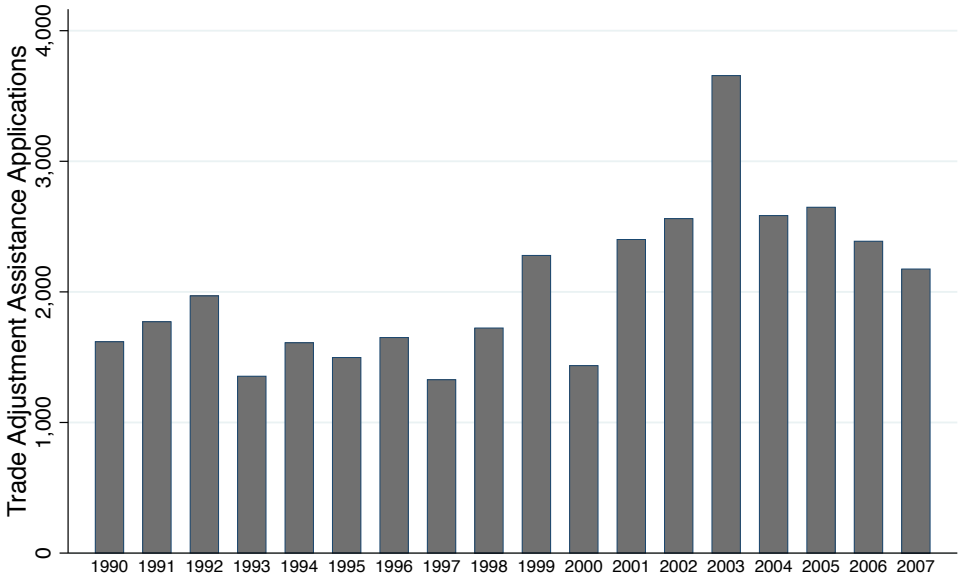


Figure A3: Applications of Trade Adjustment Assistance, 1990-2007

	1990-1999		2000-2007	
	Affected Workers	Petitions	Affected Workers	Petitions
Company	89.38	3168	72.01	8806
State	-	-	65.29	2066
Union	139.32	2188	127.27	2776
Worker	83.99	8043	85.26	6160
Others	91.71	3399	65.60	40
All	93.78	16798	83.14	19848

Table A1: TAA Applications by Petitioner Type, 1990-2007

A2 Classifying Floor Speeches on TAA

We describe the procedure of collecting and classifying legislators' floor speeches on TAA. From the *ProQuest Congressional*, we collect all remarks by legislators containing keywords "TAA" or "Trade Adjustment Assistance" anywhere in the text. When a given legislator delivers multiple remarks on the same day during the session, these are considered as one remark. The collected data include 448 speeches delivered by 207 legislators. We hand-code 20% of documents, and classify them into pro-TAA, anti-TAA, and others where TAA is only mentioned in passing.

We then conduct a supervised learning analysis to machine-code the rest of documents. We test five algorithms (maximum entropy, support vector machine, general linerzied models, random forests, and decision trees) with the coded documents to compare the performance of each algorithm. Three algorithms (support vector machine, maimum entropy, and decision trees) proved to outperform the rest two as presented in Table A2.

Table A2: Overall Algorithm Accuracy

Algorithm	Precision	Recall	F-score
Maximum Entropy	0.59	0.56	0.55
Support Vector Machine	0.65	0.61	0.61
General Linearized Models	0.49	0.44	0.43
Random Forests	0.51	0.49	0.46
Decision Trees	0.49	0.5	0.48

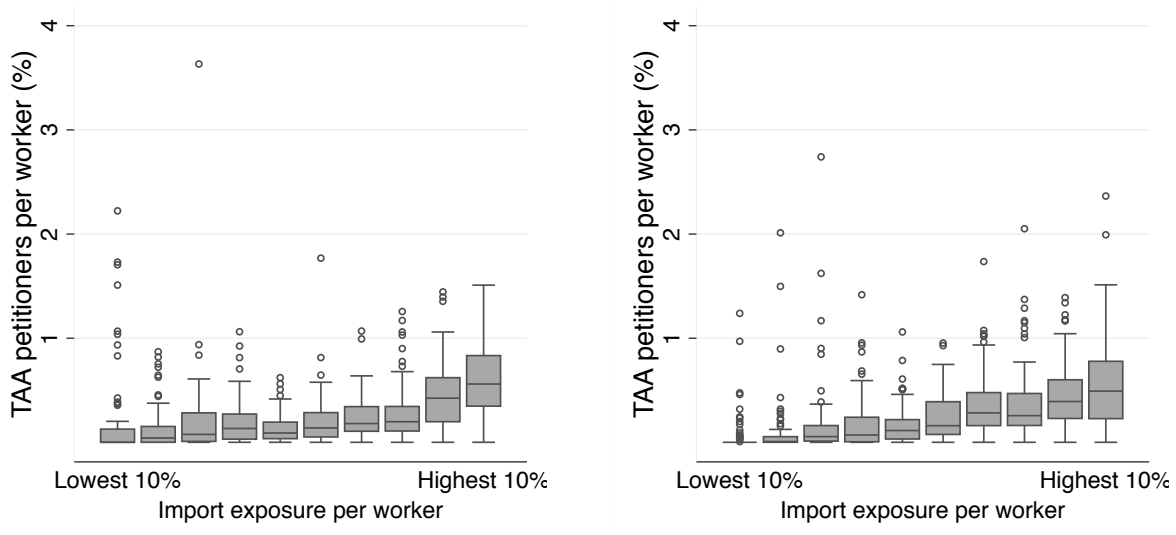
We thus classify the rest of documents relying on the three mechanisms. Table A3 shows that at least two out of three algorithms agree on the classification for 98 percentage of documents, yet in such casees, recall rate is 0.72. When all three mechanisms make the same prediction, the coverage is down to 0.48 but the recall rate reaches 0.81, which is comparable to human coding. We take the machine-coded classification only when the three algorithms agree on the classification. In other cases, we manually review the coding to improve the accuracy of classification.

Table A3: Ensemble Agreement Coverage and Recall

	Coverage	Recall
n>=2	0.98	0.72
n>=3	0.48	0.81

A3 Responses of TAA to Import Exposure

This section describes the variation in the responsiveness of TAA pickups to trade exposure. Figure A4 illustrates the variation in TAA applications in response to trade exposure for the 1990s and 2000s. The *y-axis* denotes the percentage of trade-affected workers included in the TAA applications. We calculate the total number of estimated affected workers included in the petitions for each decade, and divide it by the number of workers in the beginning of the decade. The *x-axis* denotes the level of import exposure per worker in the beginning of the decade. We plot TAA petitioners by the level of import exposure. The figure shows a clear positive relationship between trade exposure and TAA petitions. Yet, it also demonstrates a significant variation in the responsiveness across CZs.



(a) 1990-1999

(b) 2000-2007

Figure A4: TAA Petitioners by Import Exposure per Worker in the 1990s and the 2000s

A4 Additional Tests

- Table A4 presents the estimation results using the amount of TAA spending as dependent variable instead of TAA applications. Our substantive findings remain same as the ones presented in Table 3 using petitions as dependent variable.

- Table A5 estimates the effect of elite attitudes on petitions according to who initiated them, separately for districts with high and low information environment. The results show that the effect of *Pro-TAA vote* appears to be the most salient for worker-initiated petitions in districts with high media congruence. The effect of *Pro-TAA speech* also appears to be significant for worker-initiated petitions in high media congruence. However, neither *Pro-TAA vote* nor *Pro-TAA speech* appears to be important in explaining the variations in TAA petitions in low information districts where workers are not well informed about their legislators.

- Table A6 estimates the effect of elite attitudes toward TAA on *TAA proportion* calculated as the proportion of TAA payments over the combined amount of SSDI payments, TAA benefits, and Supplemental Security Income (SSI) payments. The results show that this proportion increases by 0.1 percentage point with a favorable vote on TAA by legislator. This shows that our findings on the substitution effect between different government transfers is not entirely driven by the elite effect on TAA given its magnitude.

Table A4: Elite Attitudes and TAA Applications

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	TAA Spending				Log(TAA Spending)			
Import exposure per worker	0.337**	0.329**	0.191**	0.192**	0.097**	0.095**	0.039**	0.039**
	(0.105)	(0.104)	(0.071)	(0.072)	(0.027)	(0.027)	(0.013)	(0.013)
Pro-TAA vote	0.164**	0.190**	0.197**	0.185*	0.057**	0.062**	0.066**	0.044**
	(0.050)	(0.053)	(0.055)	(0.073)	(0.012)	(0.013)	(0.012)	(0.013)
Dem vote share		-0.159	-0.078	-0.035		-0.034	-0.008	0.040^{+}
		(0.105)	(0.093)	(0.091)		(0.039)	(0.024)	(0.021)
Commuting Zone FE	No	No	Yes	Yes	No	No	Yes	Yes
Decade FE	Yes	Yes	Yes	No	Yes	Yes	Yes	No
Year FE	No	No	No	Yes	No	No	No	Yes
Observations	12214	12036	12036	12036	12214	12036	12036	12036

Dependent variable is the amount of TAA benefits in columns 1-4, and its logged amount in columns 5-8.

All models control for population (logged).

Robust standard errors clustered on state in parentheses

$^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$

Table A5: Elite Attitudes and TAA Applications by Petitioner Types and Media Congruence Level

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Petitions				Affected Workers			
	Workers	Unions	Firms	States	Workers	Unions	Firms	States
High Media Congruence								
Import exposure per worker	0.033**	0.015	-0.004	0.005	0.179**	0.074	-0.039	0.021
	(0.012)	(0.012)	(0.025)	(0.004)	(0.063)	(0.050)	(0.083)	(0.018)
Pro-TAA vote	0.087**	-0.002	0.048	-0.000	0.387**	-0.070	0.124	-0.001
	(0.016)	(0.012)	(0.030)	(0.008)	(0.079)	(0.053)	(0.113)	(0.033)
Pro-TAA speech	0.088*	-0.022^{+}	0.089*	0.031^{+}	0.169	-0.126^{+}	0.283^{+}	0.082
	(0.039)	(0.011)	(0.038)	(0.019)	(0.115)	(0.066)	(0.149)	(0.063)
Dem vote share	0.050	0.109^{+}	0.204	-0.037	-0.366	0.573*	0.368	-0.185
	(0.159)	(0.059)	(0.128)	(0.039)	(0.562)	(0.245)	(0.329)	(0.140)
Commuting Zone FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2300	2300	2300	2300	2300	2300	2300	2300
Low Media Congruence								
Import exposure per worker	0.047	0.037	0.087	0.121**	0.131	0.203	0.441	0.385*
	(0.086)	(0.054)	(0.119)	(0.046)	(0.365)	(0.128)	(0.318)	(0.186)
Pro-TAA vote	0.018	0.028	-0.037	-0.015	0.017	0.153	-0.071	-0.141
	(0.054)	(0.026)	(0.035)	(0.028)	(0.205)	(0.116)	(0.123)	(0.111)
Pro-TAA speech	0.113	0.084	0.072	0.077	0.205	0.116	0.229	0.220
	(0.092)	(0.057)	(0.110)	(0.049)	(0.304)	(0.124)	(0.368)	(0.170)
Dem vote share	-0.038	0.038	-0.186^{+}	-0.011	-0.307	-0.040	-0.735	0.041
	(0.098)	(0.048)	(0.113)	(0.031)	(0.377)	(0.182)	(0.464)	(0.125)
Commuting Zone FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1246	1246	1246	1246	1246	1246	1246	1246

All models control for the logged number of population.

Robust standard errors clustered on state in parentheses

$^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$

Table A6: Elite Attitudes toward TAA and TAA Payments

	(1)	(2)	(3)	(4)
Import exposure per worker	0.002**	0.002**	0.001**	0.001**
	(0.001)	(0.001)	(0.000)	(0.000)
Pro-TAA vote	0.001*	0.001**	0.001**	0.001**
	(0.000)	(0.000)	(0.000)	(0.000)
Pro-TAA speech	-0.000	0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Dem vote share		-0.001*	-0.001	-0.001*
		(0.001)	(0.001)	(0.001)
Commuting Zone FE	No	No	Yes	Yes
Decade FE	Yes	Yes	Yes	No
Year FE	No	No	No	Yes
Observations	10663	10500	10500	10500

Dependent variable is calculated as $TAA/(SSDI + TAA + SSI)$

Robust standard errors clustered on state in parentheses

$^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$