Explaining Compensation Failure: Trade, Partisan Collusion, and the Underprovision of Compensation

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Abstract

Why has there not been more compensation for the losers of globalization? I argue that compensation failure can be explained by political elites deciding not to compete over the issue. If an incumbent and challenger party adopt the same policy of not increasing compensation, the losers have no electoral exit options and may instead vote based on other issues where the parties are differentiated. In this case, a backlash to globalization is unlikely to occur and elites can avoid providing costly compensation to losers. I develop a formal model to demonstrate that this is rational behavior for elites when they are expected to compete in an indefinite number of future elections and sufficiently value future election outcomes. I then collect observational panel data on 20 European countries from 1990-2019 and show that import competition does not increase compensation when the theoretical conditions implied by model for tacit collusion are strong.

1 Introduction

Globalization, and in particular trade, has increased aggregate economic welfare but had distributional consequences. In the United States (U.S.), for example, an estimated 87% of the population gained real income from a rise in imports from China while some may have lost up to four times the average gain (Galle, Rodriguez-Clare, and Yi 2023, 349). More generally, the losers from free trade have been concentrated in "the 'old-rich' countries of Western Europe, North America, [and] Oceania," where the real incomes of lower to middle class citizens grew the least compared to any other group in the world from 1988 to 2008 (Milanović 2016, 20).

There is a growing body of evidence that these distributional consequences have political implications. Specifically, negative import shocks are associated with reduced vote share for political incumbents in the U.S. (Jensen, Quinn, and Weymouth 2017; Margalit 2011) and increased vote share for populist right-wing parties across Europe (e.g., Colantone and Stanig 2018; Milner 2021). Thus, the distributional consequences of free trade have contributed to an electoral backlash from the losers that has largely hurt incumbents and favored right-wing populists.

It is also well known theoretically that compensation can alleviate the distributional consequences of trade. By redistributing some of the gains from trade to the losers, free trade with compensation can still increase aggregate welfare yet leave no one worse off (i.e., Pareto gains) (e.g., Feenstra and Lewis 1994). However, there has been a "failure of compensation" (Frieden 2019, 182), where the supply of compensation has been less than demand in Western democracies (see next section, 2.1). Consequently, a lack of compensation has made the backlash to globalization "perfectly predictable" (Rodrik 2018, 12).

It is puzzling why incumbent political elites in these countries have failed to compensate the losers of globalization. Scholars have long been aware of free trade's distributional impacts and of the ability for compensation to generate Pareto gains. By failing to compensate those hurt by free trade, incumbent political elites appear to have harmed themselves by contributing to an electoral backlash that has benefited populist challengers. Thus, it is surprising why incumbent political elites have not anticipated the electoral backlash and compensated the losers of globalization more. Why has there not been more compensation?

I argue that under certain conditions, political parties have the ability to improve their utility by not competing with each other over compensation in an election. In particular, if two coalitions of political parties can both commit to not proposing compensation during an election, they can compete over issues that are less costly for the majority of their potential voters. The losers have a difficult time holding incumbent elites accountable when challengers seem just as likely not to provide compensation. In expectation, parties choosing not to

compete over compensation reduce the possibility of an electoral backlash to globalization.

Using observational panel data, I show that the marginal effect of import competition on a measure of compensation is positive when the conditions I identify are weak but is zero or negative when the conditions are strong. I interpret this as evidence that the conditions for tacit collusion for parties choosing not to compete are associated with less compensation, as my theory implies. In the next section I define what compensation failure is and how previous scholars have explained it. I then detail my argument before highlighting its main implications and turning to how I test my hypotheses.

2 Literature Review

2.1 Defining Compensation Failure

Several plausible indicators of compensation are observed to be decreasing. In 2019, the Organisation for Economic Cooperation and Development (OECD) described "a widespread decline in income redistribution across OECD countries" (Causa, Browne, and Vindics 2019, 13). In the U.S., Autor, Dorn, and Hanson (2016, 231) conclude that there has been "limited regional redistribution of trade gains from winners to losers." Again in OECD countries, social spending on active labor market policies (ALMP) has been trending downward (see Figure 1).

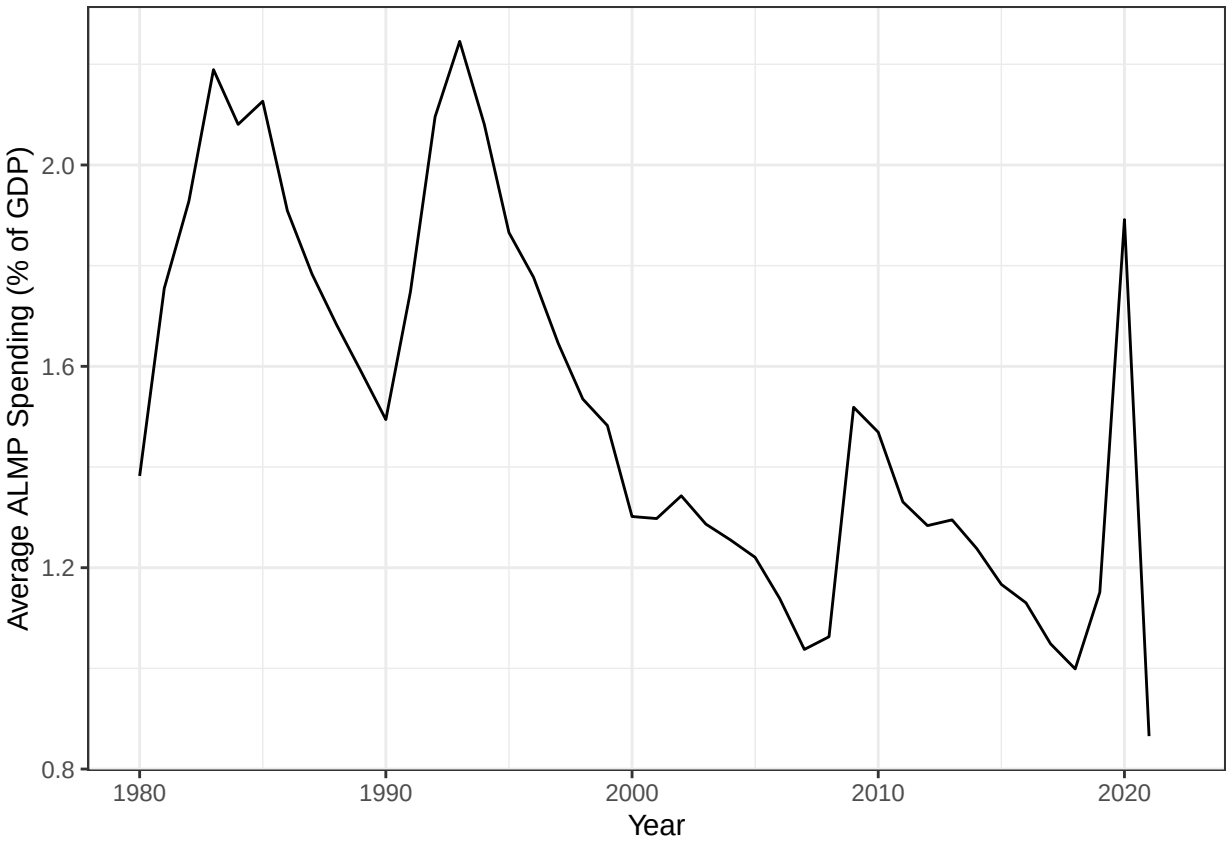

Figure 1: On average, active labor market policy (ALMP) spending has been decreasing in OECD countries. (Note the spikes during the 2008 global financial crisis and the Covid pandemic starting in 2020.)

However, compensation *failure* occurs when the supply of compensation is less than demand (Frieden 2019). Thus, to evaluate the existence of compensation failure requires investigating compensation conditional on demand. Throughout the paper, I measure the supply of compensation as total public social spending as a percent of gross domestic product (GDP) (Huber and Stephens 2001) and the demand for compensation as low-wage import penetration (Bernard, Jensen, and Schott 2006).

Total public social spending as a percent of GDP (henceforth total spending) is a commonly employed measure of welfare spending and is consistent with Rodrik's (2018, 18) definition of "actual compensation" in the form of "generous safety nets." Total spending

is less politically contentious than targeted redistribution and more holistic, making it a relatively convenient and thus likely supply of compensation (Rodrik 2018).

Low-wage import penetration (henceforth import penetration) measures the penetration of imports from low-wage countries (see section 4.2.2) and is "a cleaner test of the influence of comparative advantage than aggregate import penetration" (Bernard, Jensen, and Schott 2006, 220). Thus, greater import penetration indicates greater import competition and ultimately greater demand for compensation, since import competition from countries that tend to be relatively low-wage is responsible for the distributive consequences of free trade and lost income for losers in Western democracies (see section 3.1).

Compensation failure implies that total spending is unresponsive to changes in import penetration. If the demand for compensation increases while total spending is stagnant, demand will outpace supply. Strikingly, for 20 European countries from 1990 to 2019 greater import penetration is associated with *less* total spending (see Table 1). Across three models- a lagged dependent variable (LDV) model with country-year fixed effects, an autoregressive distributed lag (ADL) model with two lags of the dependent variable and two lags of the independent variable (Kagawala and Whitten ND) and country-year fixed effects, and a first differences (FD) model- import penetration is associated with decreased total spending. Specifically, a percentage point increase in import penetration is associated with less total spending in the next period (models 1 and 2) while positive changes in import penetration are associated with negative changes in total spending (model 3).

Rather than evaluating changes in the supply of compensation alone, Table 1 demonstrates that supply conditional on demand is decreasing. Thus, there is evidence that in some OECD countries there has indeed been a compensation failure. In the next section I discuss why this is puzzling given current explanations.

Table 1: Low-Wage Import Penetration (% of Consumption) is Negatively Associated with Total Public Social Spending (% of GDP)

	Total Spending		Δ Total Spending
	LDV	ADL (2,2)	FD
	(1)	(2)	(3)
Total Spending$_{t-1}$	0.806***	1.006***	
	(0.024)	(0.037)	
Total Spending$_{t-2}$		−0.110***	
		(0.033)	
Import Penetration$_{t-1}$	−0.137***	−0.483**	
	(0.053)	(0.192)	
Import Penetration$_{t-2}$		−0.099	
		(0.275)	
Import Penetration$_{t-3}$		0.401*	
		(0.210)	
ΔImport Penetration			−1.315***
			(0.269)
N×T	20×(17-24)=459	20×(9-15)=281	20×(12-19)=359
Unit FE	Yes	Yes	No
Year FE	Yes	Yes	No
Panel BG test p-value	3e-07	0.1983	0.0005741
R^2	0.758	0.889	0.066
F Statistic	647.614***	387.231***	23.839***

Note: *p<0.1; **p<0.05; ***p<0.01

2.2 Current Explanations of Compensation Failure

There is a large literature on the relationship between globalization and social spending and thus several arguments relevant for explaining compensation failure. Broadly speaking, there are three types of arguments that explain why there would be a lack of compensation conditional on there being demand for it: 1) compensation is too costly to supply, 2) compensation is ineffective at moderating the distributional effects of import competition (and thus not rational for elites to supply), and 3) political elites have incentives to cater to the winners of globalization rather than the losers.

The first set of arguments asserts that compensation is too costly to supply. Classic examples include those that advance the so-called efficiency hypothesis, where capital mobility and free trade lead states to compete over cheaper taxes and labor standards to attract firms (e.g., Rodrik 1997; Olney 2013; Mosley and Uno 2007). More recent efficiency arguments highlight the deadweight losses incurred from the taxation required for compensation (see Rodrik 2018). Rodrik (2018) also argues that compensation is too costly because of political commitment problems, where politicians no longer have the incentive to compensate losers once trade deals have been secured.

These arguments are certainly correct that compensation is costly. While elites may not directly pay for compensation out of their own pockets, taxes necessary for compensation plausibly create deadweight losses that may negatively affect economic growth. And most observers of elections would agree that procuring economic growth for voters is a key concern for elites (e.g., Lewis-Beck and Stegmaier 2013). However, the fact that compensation is costly does not imply that it is rational for elites to not provide compensation. If not providing compensation means that incumbent political elites lose vote share and possibly office to populist challengers, then the opportunity cost of not providing compensation is likely higher for elites than the cost of compensation itself. In other words, the expected costs of compensation must be compared to the expected costs of not compensating the losers and possibly experiencing an electoral backlash. It is not ex-ante obvious or clear from previous

literature that the expected costs of compensation were larger than the expected costs of not providing compensation, and thus arguments that highlight how costly compensation is do not sufficiently explain the observed compensation failure.

The second set of arguments suggests that compensation may not be effective at moderating the distributional effects of import competition (Frieden 2019; Rodrik 2018). If this were true, it would be irrational for elites to possibly jeopardize economic growth or the gains to the winners to compensate losers who may vote against them anyway. This is especially relevant for targeted forms of compensation, as with trade adjustment assistance (TAA) in the U.S., since they tend to be underfunded in the first place (see Autor, Dorn, and Hanson 2016). While the lack of funding for these forms of compensation also begs the question of why elites have not compensated more, the effectiveness of compensation is ultimately an empirical question. If the distributional consequences from trade are associated with voters turning to populist challengers (e.g., Colantone and Stanig 2018; Milner 2021), "effective" compensation from the perspective of elites would moderate this relationship.

In particular, one of the analyses conducted by Milner (2021) evaluates how an increase in import competition affects the vote share of populist and centrist parties in Europe. Milner's (2021) main finding is that the "China shock" (see Autor, Dorn, and Hanson 2013; Acemoglu et al. 2016) increases the vote share of populist right-wing parties. I replicated this analysis and then made the following changes: I included a LDV, an interaction between the China shock and total spending, and used the unimputed, original data collected by the author.[1] The marginal effect of the China shock across the range of total spending is shown in Figure 2 for left and right-wing centrists (i.e., traditional political elites) and left and right-wing populists. The full results are reported in the appendix.

Figure 2 suggests that compensation is effective at moderating the effect of import competition on vote shares. The marginal effect of the China shock on right and left-wing

[1]Simply appending the unimputed spending data to Milner's (2021) imputed data does not change the results for the "main" parties but does for the populist parties. However, to properly use the imputed data would require reimputing the data while including the spending data as an original covariate. I will do this in future revisions of the paper as a robustness check.

populist vote shares is positive when total spending is low but negative when total spending is high. For right and left-wing centrists, the marginal effect of the China shock on vote share is negative at low levels of total spending but positive at high levels of total spending. Consequently, there is evidence that total spending reverses the electoral backlash to globalization, where populists no longer enjoy an electoral advantage from import competition relative to traditional political elites. These results deepen the compensation failure puzzle since there is evidence that compensation moderates the distributional consequences of free trade and reduces the electoral backlash for traditional incumbent elites.

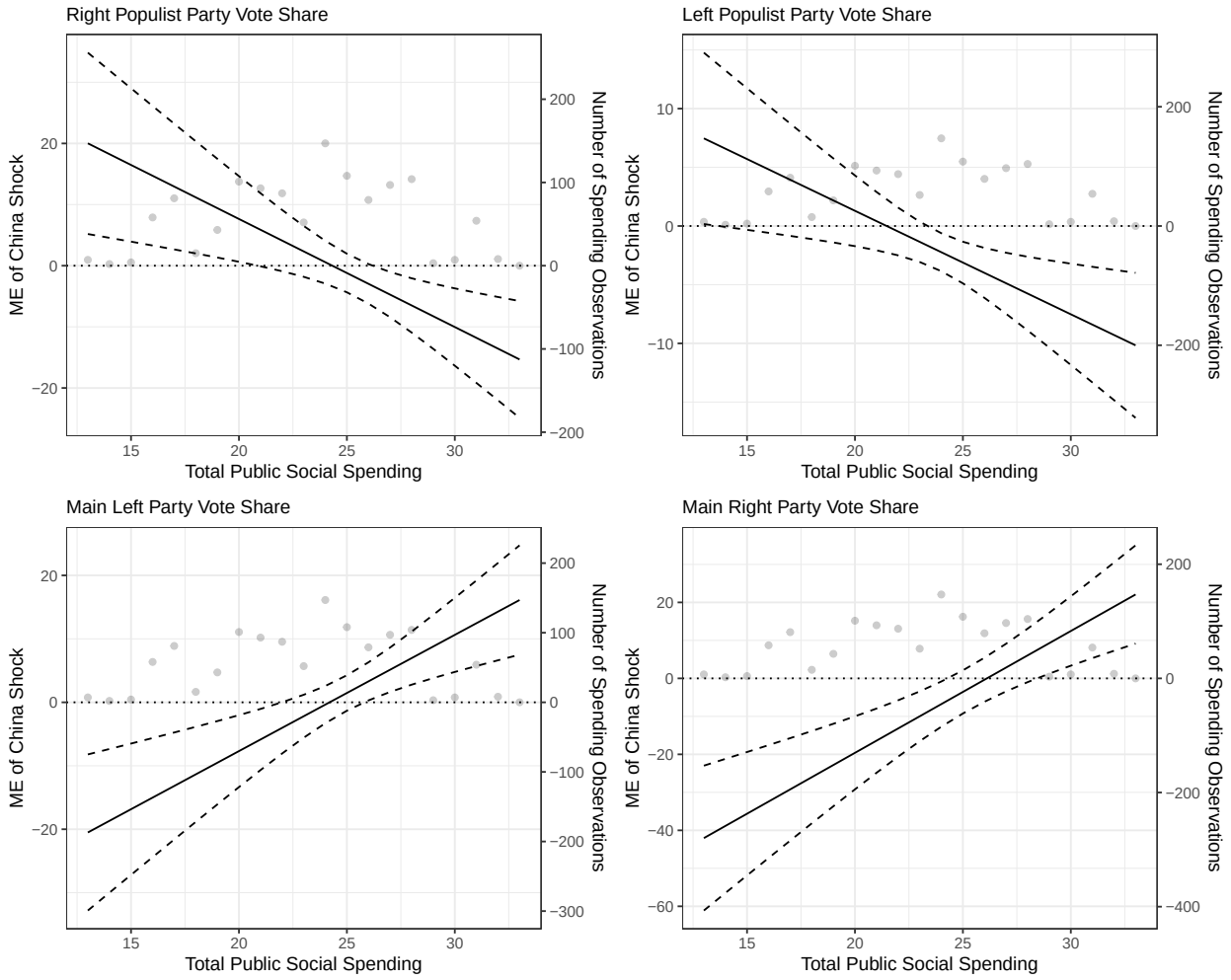

Figure 2: Reevaluating Milner's (2021) analysis of how the China shock affects vote shares. Using the author's unimputed data and including a LDV, spending appears to moderate the marginal effect of the China shock on vote shares.

The third type of argument contends that the political incentives to supply compensation may be low despite demand for compensation. Menendez (2016) argues that compensation will decrease in countries with high district magnitude and geographically concentrated losers because politicians will place less weight on losers, who will have increasingly different preferences for compensation the more concentrated they are. However, it is unclear from the argument why compensation failure is rational for political elites. The author implies that high district magnitude makes elites weigh the demands of the winners more, but in foot-

note 7 the author states that "Simply ignoring the demands of concentrated trade losers is unlikely to maximize electoral returns, as politicians in high-magnitude systems have strong incentives to bring every single vote on board..." (Menendez 2016, 669).

As before with the arguments that compensation is too costly, it is not ex-ante clear that decreasing compensation is rational if there exists a threat of electoral backlash from the losers. A political challenger would be incentivized to provide more compensation to win the votes of these losers and force the incumbents to provide more compensation to avoid losing the election. An explanation of compensation failure would have to explain why the expected costs of not providing compensation (i.e., the possibility of an electoral backlash) were lower than the expected costs of compensation. In the next section, I offer my explanation for why this would be the case and thus why compensation failure is rational for political elites.

3 Theory

3.1 My Argument

Free trade has aggregate and distributional consequences. Because countries tend to specialize in what they have a comparative advantage in producing, countries are more productive when they trade with each other and average incomes rise. But how factors of production are reallocated within countries to best respond to comparative advantage pressures generates distributional effects. According to the classical Heckscher-Ohlin model, countries have a comparative advantage in producing goods that intensively use the factor of production they are relatively abundant in (Feenstra and Taylor 2020). For instance, if a country is abundant in labor but scarce in capital they will tend to specialize in and export goods that intensively use the factor of labor. The Stolper-Samuelson theorem then predicts that if factors of production are freely mobile, people will reallocate the factors they own towards the production of labor-intensive goods and labor will gain real income while capital loses real income.

Many OECD countries tend to be relatively abundant in capital while countries part of BRIICS, for example, tend to be relatively abundant in labor. As trade has increased between the two sets of countries (see Figure 2), the Stolper-Samuelson theorem implies that people who own labor in many OECD countries have lost real income while the owners of labor in BRIICS countries have gained real income. Indeed, this phenomena is one of the reasons that global inequality has decreased but at the expense of middle to lower class citizens of developed, Western democracies (Milanović 2016).

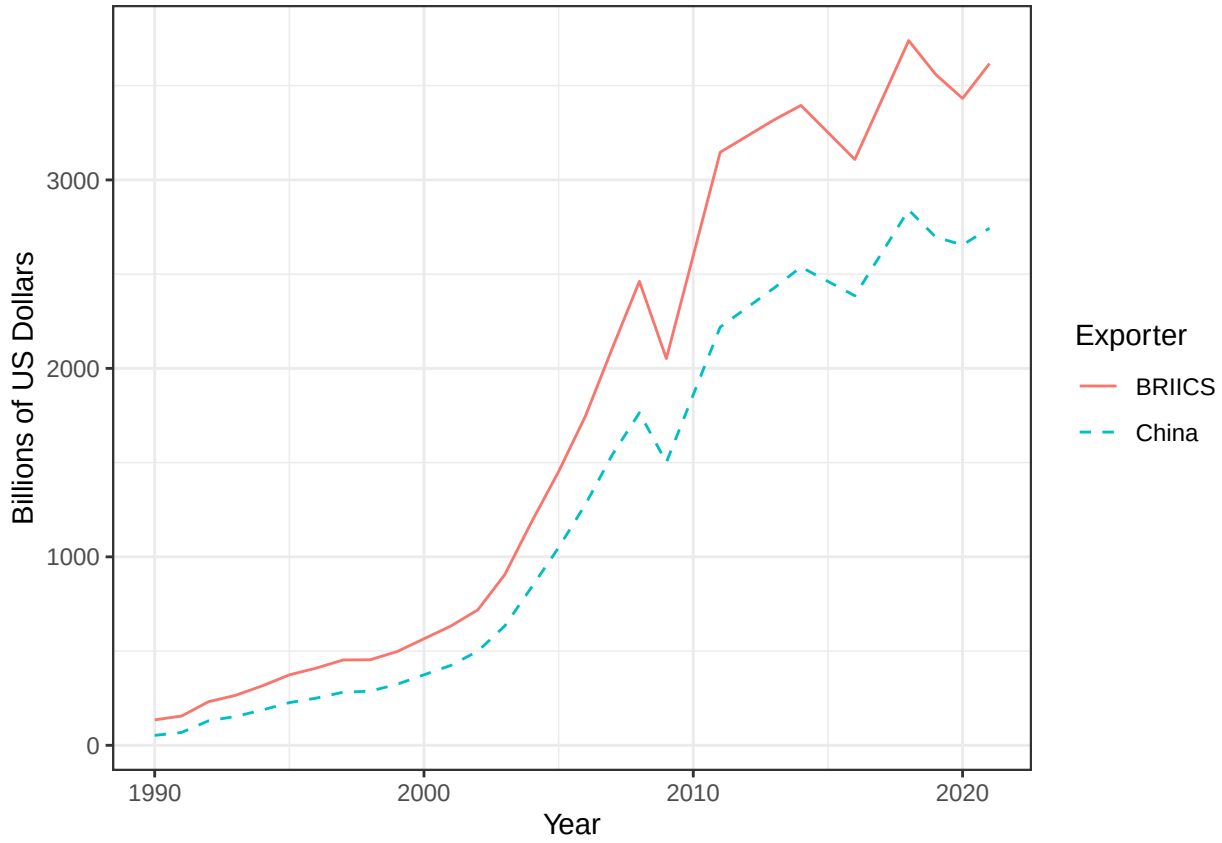

Figure 3: Imports to OECD countries from BRIICS countries (Brazil, Russia, India, Indonesia, China, and South Africa).

All else equal, I assume that these citizens prefer compensation for the real income they have lost from free trade. A manufacturing worker who was laid off due to import competition, for example, may not be able to regain the pride associated with their old job

or expect to earn an identical income in the future. But this assumption means that they would still prefer to receive material compensation for being laid off than to be fired without compensation.

Moreover, I assume that these citizens hold incumbent political elites responsible for their lost income and compensation. Classic economic voting literature largely concludes that the average voter is myopic, retrospective in their evaluation of the government, and particularly sensitive to negative shocks (e.g., Nannestad and Paldam 1994; Lewis-Beck and Stegmaier 2013). This assumption also enjoys support from studies that find a relationship between negative import shocks and anti-incumbent voting effects (Margalit 2011; Jensen, Quinn, and Weymouth 2017). It is not necessary for citizens to understand economics for them to understand that they are not as well off as they used to be, and it does not seem unreasonable that they would at least partially hold the government responsible.

I assume that the relevant political elites for my argument are political parties. Parties craft policy, including on trade and compensation, and have reputations that extend beyond an individual leaders' tenure. Any single government or administration may not be responsible for compensating the losers that have been hurt over decades of free trade. But parties have an interest in their brand and reputation with voters beyond particular governments, such that they are likely to be particularly concerned about an electoral backlash from losers in the future. Furthermore, I assume that political parties prefer to win elections. Even if they would like to pass specific legislation, they must first win elections to do so. Lastly, for the sake of the argument I assume that there are two main parties or coalitions of parties that compete in elections. While this is a restrictive assumption, there are multiparty countries that credibly fit this assumption (e.g., Germany over the last few decades with the SPD and CDU parties).

I argue that under these assumptions, an incumbent political party will compete with a challenging political party over proposing compensation to the losers. If the losers prefer compensation, they should vote for the party that compensates them most in expectation,

ceteris paribus. The party that fails to compete over increasing compensation may experience electoral backlash and lose votes from the losers.

However, both the incumbent political party and challenger party would be better off if they could compete over other issues than compensation. If they adopt similar policies on compensation while differentiating themselves on other issues, they can make it difficult for the losers to manifest a backlash about the lack of compensation. When the incumbent and challenger have similar policies, voters may choose between them based on the policies where they are distinguishable. If the incumbent and challenger differentiate themselves by adopting different positions on climate policy, for example, the losers may vote based on their preference for climate policy rather than vote against the incumbent for failing to compensate them when the challenger is likely to do the same.

Thus, when both the incumbent and challenger do not offer compensation, the incumbent's expected cost of not compensating the losers decreases because it is less likely that voters will manifest a backlash on the issue of compensation. The incumbent can then focus on maintaining free trade without increasing compensation, providing economic benefits for the majority of voters who do win from free trade and competing with the challenger on less costly issues.

In conclusion, my explanation for the puzzling compensation failure is that political parties have tacitly colluded to compete over issues other than compensation. By doing so, they effectively reduced the probability that an electoral backlash would fall on either one of them. The benefit of tacit collusion is that parties could continue the status quo of free trade with little compensation to minimize the potential costs of compensation on economic growth and the benefits accumulated to the winners of trade. Thus, parties can ensure that most citizens benefit from their policies and compete with each other on issues that are less costly for the majority of supporters.

In the next section I build a simple theoretical model to demonstrate that this is behavior is rational for elites and to generate testable implications.

3.2 Game-Theoretic Analysis of the Argument

Let Γ_δ be a game where $\Gamma_\delta = \Big(N, (\mathcal{B}_i^\infty)_{i\in N}, (\gamma_i^\delta)_{i\in N}\Big)$ (Maschler, Solan, and Zamir 2020, 552). The set of players, $N = \{I, Ch\}$, consists of an incumbent (I) and challenger (Ch) party that are competing to win an election. $\mathcal{B}_i^\infty$ is the set of mixed strategies available to player i, where each strategy specifies an action that player i takes at every $t \in \infty$ stage of the game. The actions that players can take is the set $A = \{C, \neg C\}$, where players decide to propose compensation (C) to the losers during the election or not ($\neg C$). I assume that the proposal is binding, such that the winner of the election must pay the cost of compensation (c) proposed during the election. γ_i^δ is the utility function that associates each strategy with a total payoff for each player i. It is a discounted utility function, where the utility (u) for actions played in stages $t > 1$ is discounted by a factor of $0 < \delta < 1$. Specifically, the discounted utility function for a strategy $\tau_i \in \mathcal{B}_i^\infty$ is $\gamma_i^\delta(\tau_i) = \mathbb{E}\Big[(1-\delta)\sum_{t=1}^{\infty}\delta^{t-1}u_i^t\Big]$.

Figure 3 displays the base game that is infinitely repeated. The first or row player is the incumbent party which must decide between proposing compensation or not. The second or column player is the challenger party facing the same decision. If they both choose not to compensate, the incumbent earns a payoff of $p\psi$ or the probability that they get the payoff of winning. The challenger would also earn a payoff associated with the probability that they win office, or $(1-p)\psi$. However, if the incumbent proposes to compensate the losers while the challenger does not, the incumbent wins the election with certainty (ψ) while the challenger earns a payoff of 0. If the challenger instead proposes compensation while the incumbent does not, they win the election with certainty and earn the same payoff from winning office (ψ) while the incumbent earns 0. Lastly, if both players compensate then the incumbent has the same probability of winning office as before (p) but now will have to pay the cost of compensation c if they win. The challenger's payoff would be $(1-p)(\psi - c)$.

The base game is a prisoner's dilemma when $0 < c < \psi$ and $0 < p < 1$. Each party has an incentive to propose compensation regardless of what the other party does. If one party is not proposing compensation, the other party would win the election with certainty. And to

avoid losing the election with certainty, each party has an incentive to propose compensation to at least compete for office with some probability. By iterated elimination of dominated strategies ($\neg C$), the only Nash equilibrium of the base game is (C, C).

		Ch	
		$\neg C$	C
I	$\neg C$	$p\psi,\ (1-p)\psi$	$0,\ \psi$
	C	$\psi,\ 0$	$p(\psi - c),\ (1-p)(\psi - c)$

Figure 4: PD when $0 < c < \psi$ and $0 < p < 1$

However, in the infinitely repeated base game it can be rational for the players to not propose compensation $(\neg C, \neg C)$. If each player adopts a punishment strategy such that it is not profitable for the other player to deviate from $(\neg C, \neg C)$, then it can be an equilibrium of the game Γ_δ. Let τ^{GT} represent a pair of grim trigger strategies, $(\tau_I^{GT}, \tau_{Ch}^{GT})$, that instructs the players to $\neg C$ in the first stage and all subsequent stages of the game unless the other player C. Once a player C's, the other player will punish them by playing $\neg C$ and holding them to the minmax value (see Appendix).

τ^{GT} is an equilibrium if and only if for all players $i \in N$ the payoff from the strategy pair is greater than or equal to the payoff player i could get from playing any other strategy while player $-i$ still plays τ_{-i}^{GT} (Maschler, Solan, and Zamir 2020, 552):

$$\gamma_i^\delta(\tau^{GT}) \geq \gamma_i^\delta(\tau_i, \tau_{-i}^{GT}).$$

The best alternative strategy a player can consider is C for all stages $t \in \infty$. Since the other player will play $\neg C$ in the first stage per the grim trigger strategy, player i can earn a larger payoff that stage by compensating. In all other stages, it would be best to compensate since

the other player with the grim trigger strategy will also be playing C. Thus, for the strategy pair τ^{GT} to be an equilibrium it must be greater than or equal to the strategy pair of playing all C:

$$\gamma_i^{\delta}\Big((p\psi,(1-p)\psi)_{t=1\to\infty}\Big) \geq \gamma_i^{\delta}\Big((\psi,\psi)_{t=1} + \Big(p(\psi-c),(1-p)(\psi-c)_{t=2\to\infty})\Big)$$

Solving for δ (see Appendix), the equilibrium condition for not compensating in every stage of the game is:

$$(\delta_I^*, \delta_{Ch}^*) \geq \left(\frac{\psi - p\psi}{\psi - p(\psi-c)}, \frac{\psi-(1-p)\psi}{\psi-(1-p)(\psi-c)}\right) \tag{1}$$

Note that the base game specified $0 < c < \psi$ and $0 < p < 1$ as requirements for the model to be a prisoner's dilemma. It is important to also note that the punishment strategies discussed above ensure that there are many equilibria possible in the infinitely repeated game (i.e., the Folk Theorem, see Appendix). It is possible to construct a learning model to predict which equilibrium will be selected by players (e.g., Jindani 2022), but it is reasonable to expect that players will choose the "best" equilibrium they can. τ^{GT}, the equilibrium of interest, is Pareto dominant and thus can be expected to be the equilibrium of choice for players.

3.2.1 Implications

The comparative statics for each parameter in inequality (1) are displayed in Figure 5. For each parameter being varied, I hold the others at reasonable values (e.g., the cost of compensation may be positive but less than the payoff from office). The following implications generally hold unless one or more parameters are at their extrema (e.g., if cost equals 0, there is no combination of the other two parameters that make the equilibrium possible).

Ceteris paribus, increasing the cost of compensation (c) decreases the right-hand side of inequality (1) and makes it easier to satisfy (left graph). This implies that as the cost

of compensation increases, the required level of "patience" or required value placed on the future for collusion to be rational decreases. This can be interpreted as players being more willing to tacitly collude when the cost of compensation is higher because competing over compensation becomes more costly in expectation.

$I1$: Holding all else equal, the more costly it is to compensate the losers the more willing political parties are to tacitly collude to avoid competing over compensation.

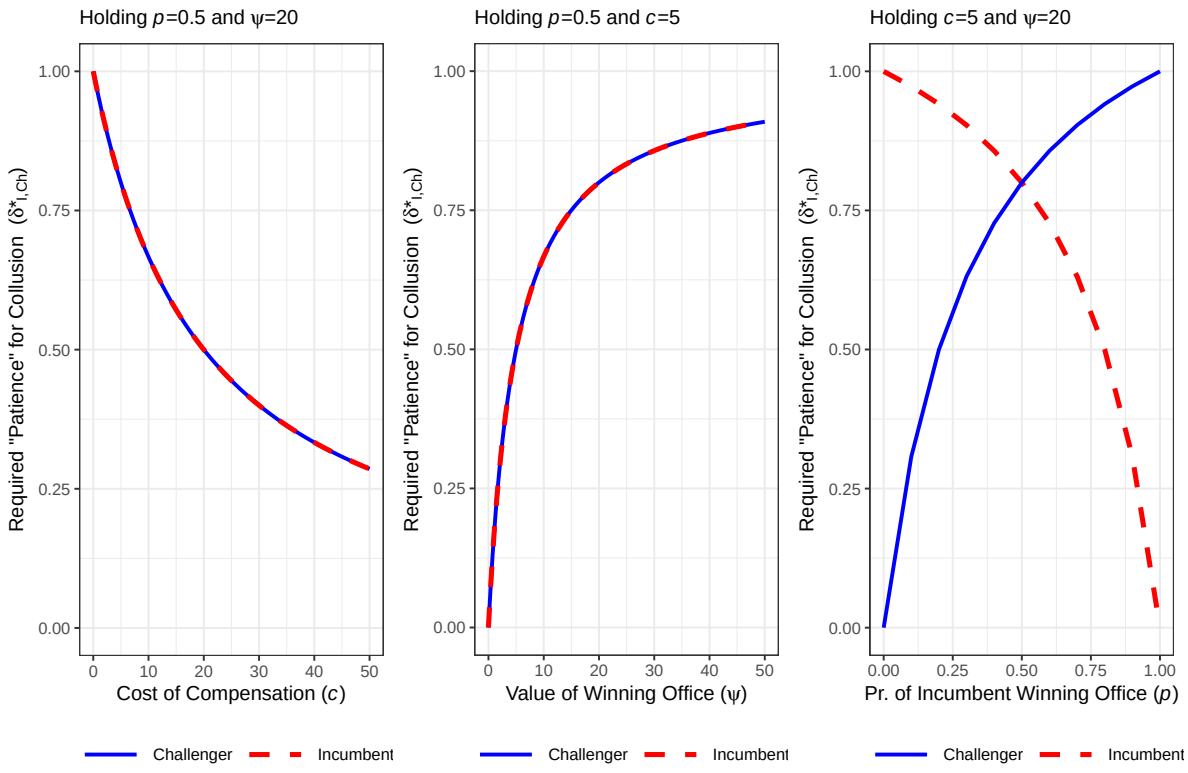

Figure 5: The potential for collusion is greater when the required "patience" (or required value placed on the future) for colluding (eq. 1) is lower. From left to right, these graphs imply that the potential for collusion increases in the cost of compensation, decreases in the value of winning office, and increases (decreases) in the probability of the incumbent (challenger) winning office. Thus, eq. 1 is easiest to satisfy when compensation is costly, the payoff from winning office is relatively low (i.e., a one-shot defection to maximize the chances of winning is outweighed by future possibilities of winning office without having to compensate), and both the incumbent and challenger have similarly high chances of winning.

Increasing ψ, or the payoff that players get from winning office, increases the right-hand side of inequality (1) *ceteris paribus* (see middle graph). A greater payoff from winning office makes the inequality harder to satisfy and implies that a greater payoff from winning office makes players less willing to tacitly collude with one another. This is largely due to the fact that a larger payoff from winning office enhances the incentive to defect. If ψ is large enough,

players would rather "take the money and run" by defecting for one period and foregoing the gains from collusion.

$I2$: Holding all else equal, the greater the payoff from winning office the less willing political parties are to tacitly collude.

Holding all else constant, increasing the probability of the incumbent winning the election (p) decreases the right-hand side of inequality (1) for the incumbent (see right graph), making the required level of "patience" or value placed on the future for collusion lower for the incumbent. This can be interpreted as increasing the expected payoff from future elections and decreasing the attractiveness of a one-shot defection. However, a higher p implies a smaller $1 - p$ or the probability that the challenger wins the election. Accordingly, a *ceteris paribus* increase in p increases the right-hand side of inequality (1) for the challenger and makes it more difficult to satisfy or requires a greater value placed on the future for collusion. A smaller probability of winning for the challenger similarly implies that they will earn smaller payoffs from future elections, making a one-shot defection more attractive. Thus, increasing p makes the incumbent party more willing to collude but the challenger party less willing to collude.

$I3$: Holding all else equal, increasing the probability of one party winning makes that party less adverse to colluding but the other party more so. When both have relatively equal chances of winning, the overall willingess to collude is highest.

4 Research Design

4.1 Hypotheses

Thus far I have argued that increased demand for compensation may not result in a greater supply of compensation if two political parties or coalitions of parties choose not to compete over compensation. This is rational when these parties expect to compete in an indefinite number of elections and sufficiently value future election outcomes. Parties are more likely to sufficiently value the future when the cost of compensation is high, the payoff from winning office is relatively low, and the probability of winning is relatively equal. I term these the *conditions for tacit collusion* and thus compensation failure.

The ideal experiment would consist of randomly assigning these values to countries and observing how an increase in import competition affects compensation. The estimate of interest is the marginal effect of import competition on compensation, which should be positive when the conditions for tacit collusion are poor (i.e., low cost of compensation, high payoff of winning office, and unequal probabilities of winning for incumbent and challenging parties or coalitions). In light of the difficulty of such an experiment, I collect observational data on measures for import competition, compensation, and the conditions for tacit collusion. These data are described in the next section (4.2).

My research strategy is thus to evaluate the marginal effect of import competition on compensation using these observational measures. My theory is that the marginal effect is conditional on the conditions for tacit collusion, which is operationalized by regressing compensation on interactions between each condition for tacit collusion and import competition. Importantly, the implications described in section 3.2.1 are only true when holding the other parameters at reasonable or non-extreme values. Accordingly, my expectations for how a change in one parameter affects the total marginal effect of import competition depends on what the values of the other conditions for tacit collusion are observed to be at. For example, it is unclear what the precise expectation for the marginal effect of import competition

should be when one parameter makes tacit collusion more likely (say, the probability of the parties winning [p] being relatively equal) while the other two are not very favorable (say, somewhat low cost [c] and/or somewhat high payoff from winning [ψ]).

However, I do have precise expectations when all three of the conditions for tacit collusion are observed to be low. In this case, it is clear that tacit collusion should not be very likely and thus compensation failure should be unlikely to occur. In this case, it should be the case that the marginal effect of import competition on collusion is positive. This is a version of the classic *compensation hypothesis*. When political elites cannot insulate themselves from the demand for compensation, we should expect more compensation to occur:

Compensation Hypothesis : Import competition will increase compensation when the conditions for tacit collusion are not favorable for collusion.

Likewise, I also have precise expectations when all three conditions are observed to be high. It is clear that when the three conditions all indicate that tacit collusion is possible, it should be likely that compensation failure occurs and there is no observed relationship between demand (import competition) and compensation. Thus, when tacit collusion is likely political elites are able to insulate themselves from the demand for compensation and it should not occur. I call this the *collusion hypothesis*:

Collusion Hypothesis : Import penetration should be unrelated to compensation when the conditions for tacit collusion are favorable for collusion.

4.2 Data

4.2.1 Dependent Variable (Compensation as Total Spending)

My dependent variable is compensation, measured as total public social spending. Data on total spending comes from the OECD (OECD 2023). As described in the section on

defining compensation failure (2.1), Huber and Stevenson (2001) advocate for this measure of spending as the best indicator of generosity or compensation in a country while the measure is consistent with Rodrik's (2018) discussion of compensation likely being in the form of broad social safety nets. Figure 7 shows the average level of total spending for OECD countries.

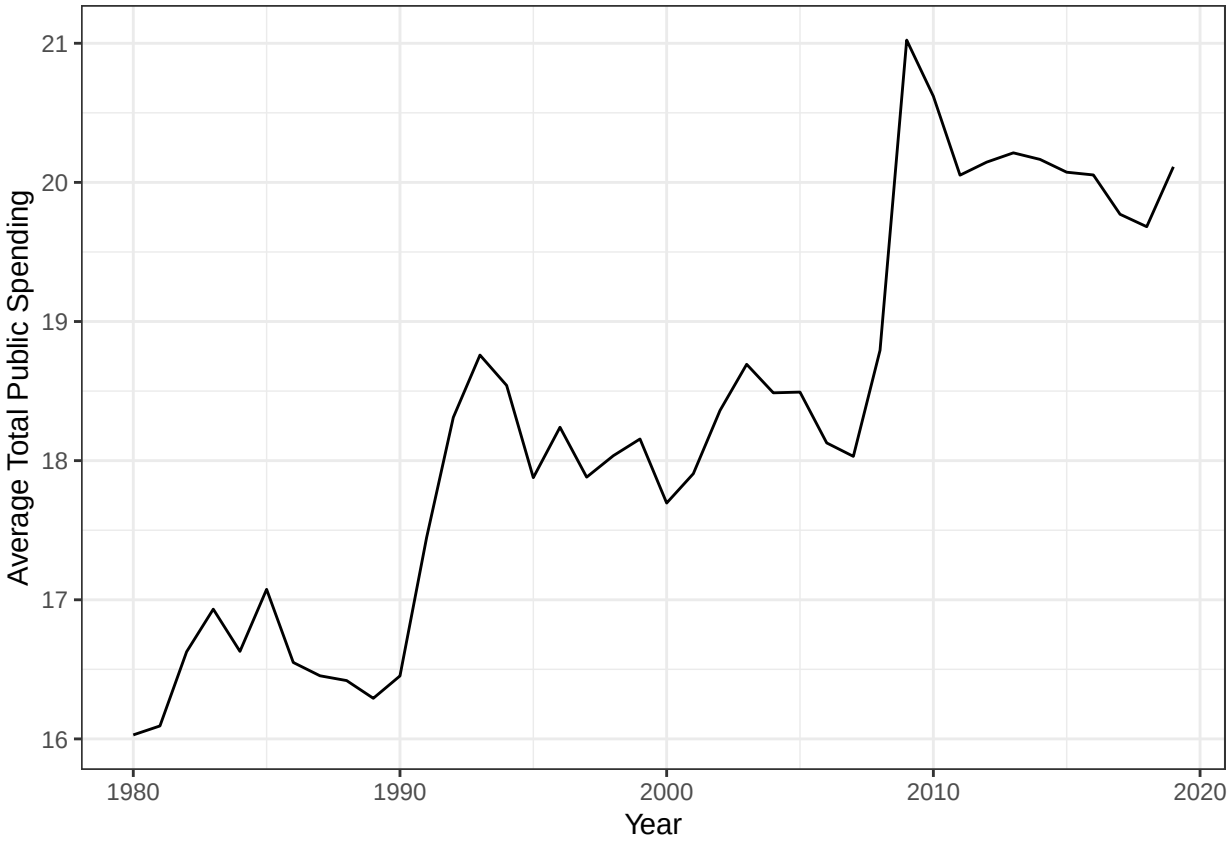

Figure 6: Average total spending across OECD countries.

4.2.2 Main Independent Variable (Import Competition as Import Penetration)

My main independent variable is import competition. I follow Bernard, Jensen, and Schott (2006) in using low-wage import penetration to measure import competition. They define low-wage import penetration as the product of the proportion of imports from low-wage countries times aggregate import penetration:

$$\frac{I_{LW}}{I_T} \times \frac{I_T}{(GDP + I_T - E_T)} = \frac{I_{LW}}{(GDP + I_T - E_T)}. \tag{2}$$

To identify low-wage countries, Bernard, Jensen, and Schott (2006) compare every country's per capita GDP to the U.S.'s per capita GDP. If a country's GDP per capita is less than 5% of the U.S.'s in a particular year, they code the country as low-wage. They argue that this is a more precise way to capture the comparative advantaged trade in labor-intensive goods that is responsible for import competition in the West. I collect trade data from the OECD (OECD 2024) and modify this identification slightly to code a country as low-wage if over the sample period (1990-2019) the country's GDP per capita is on average less than 5% of the U.S.'s. I do this because there are many countries that exceed this threshold in later years despite being low-wage for much of the sample period and, theoretically, still being similar in their production of labor-intensive goods. This includes China, which exceeds 5% of the U.S.'s GDP per capita in 2007 but is on average poorer than the cutoff. Table 2 lists the countries identified as low-wage for the period 1990 to 2019 while Figure 6 shows the average level of low-wage import penetration for all countries.

Table 2: Low-Wage Countries

Afghanistan	Gambia, The	Pakistan
Albania	Ghana	Papua New Guinea
Angola	Guinea	Philippines
Armenia	Guinea-Bissau	Rwanda
Bangladesh	Haiti	Sao Tome and Principe
Benin	Honduras	Senegal
Bhutan	India	Sierra Leone
Bolivia	Indonesia	Solomon Islands
Burkina Faso	Kenya	South Sudan
Burundi	Kiribati	Sri Lanka
Cabo Verde	Kyrgyz Republic	Sudan
Cambodia	Lao PDR	Tajikistan
Cameroon	Lesotho	Tanzania
Central African Republic	Liberia	Timor-Leste
Chad	Madagascar	Togo
China	Malawi	Turkmenistan
Comoros	Mali	Uganda
Congo, Dem. Rep.	Mauritania	Uzbekistan
Congo, Rep.	Moldova	Vanuatu
Cote d'Ivoire	Mozambique	Viet Nam
Djibouti	Myanmar	West Bank and Gaza
Egypt, Arab Rep.	Nepal	Yemen, Rep.
Equatorial Guinea	Nicaragua	Zambia
Eritrea	Niger	Zimbabwe
Ethiopia	Nigeria	

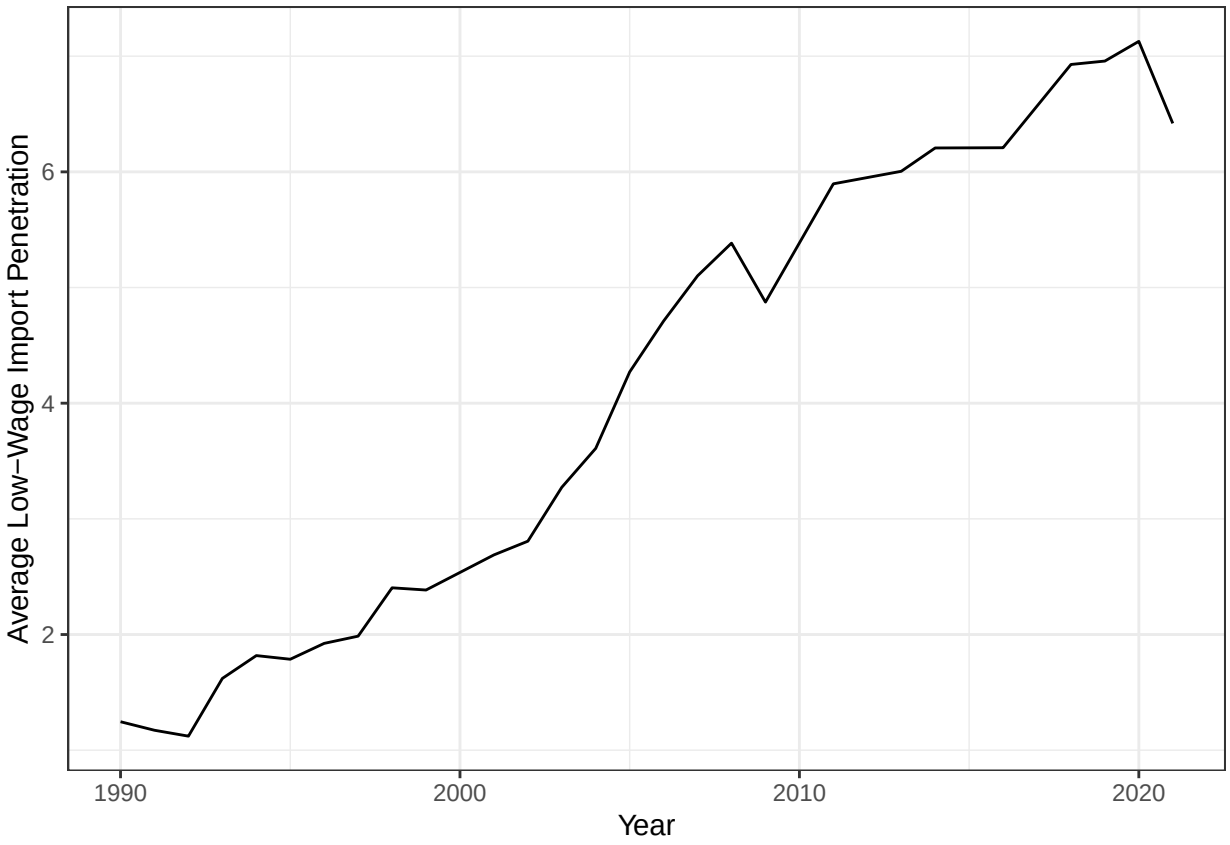

Figure 7: Average low-wage import penetration across all countries.

4.2.3 Conditions for Tacit Collusion ($\{c, \psi, p\}$ from Figure 5)

To measure the conditions for tacit collusion described in section 3.2.1, I collect data on a country's primary balances as a percentage of GDP (IMF 2021), the maximum possible duration of government (Hellstrom et al. 2024), and the seat shares of governments in their country's lower house (Doring and Manow 2024).

Primary balances measure the budget surplus or deficit that countries have every fiscal year. This is a plausible measure for the cost of compensation because the main cost of compensation is the raising of inefficient taxes to pay it. If budget surpluses are high, this cost is relatively low. When budget deficits occur, the cost of raising additional revenue to pay for compensation is high (also known as a high marginal cost of public funds).

To measure the value of winning office, I use the maximum duration of the cabinet. The

logic here is that if a government has a longer possible time in office, the parties competing for that office will view it as more valuable. This captures the theoretical payoff from office well because like the theoretical parameter, if the payoff is high enough it can make collusion unattractive relative to a defection. If the time a government could be in office was 100 years, for an extreme example, then a party would not care about cooperating with another party to improve payoffs across future election outcomes.

To measure the probability of winning office for the incumbent, I evaluate the combined seat share that incumbent parties have in the lower house. The intuition here is that when the parties in government have more seat share in the lower house, they may use this as the best guess of how they will perform in the next election and infer that they have a good chance of winning office again. Seat share in the lower house is a better measure than vote share for parties in office because countries have various rules translating votes to seats and sometimes more than one round of an election.

To evaluate my hypotheses, I condition the marginal effect of import penetration on compensation on these three measures. However, because the theoretical parameters do not have the same direction of effect on collusion (i.e., a higher payoff from winning decreases the ability to collude while a higher cost makes it more likely), I reverse the signs for two of these parameter measures such that a one-unit increase in any three of them can be interpreted as having the same effect in an empirical model. Specifically, I reverse the sign for primary balances to make an increase in the measure correspond to a greater deficit instead of a greater surplus. I also reverse the sign for maximum time in office to make an increase in this measure correspond to a relatively smaller value of winning office rather than greater. Cabinet seat share is already in line with the theoretical effect of the probability of winning for the incumbent, where a greater probability indicates a higher possibility of collusion for the collusion. I also put these measures on the same scale (min-max normalization) such that increases in them are comparable. The original measures and their rescaled, normalized versions are displayed in Figure 8.

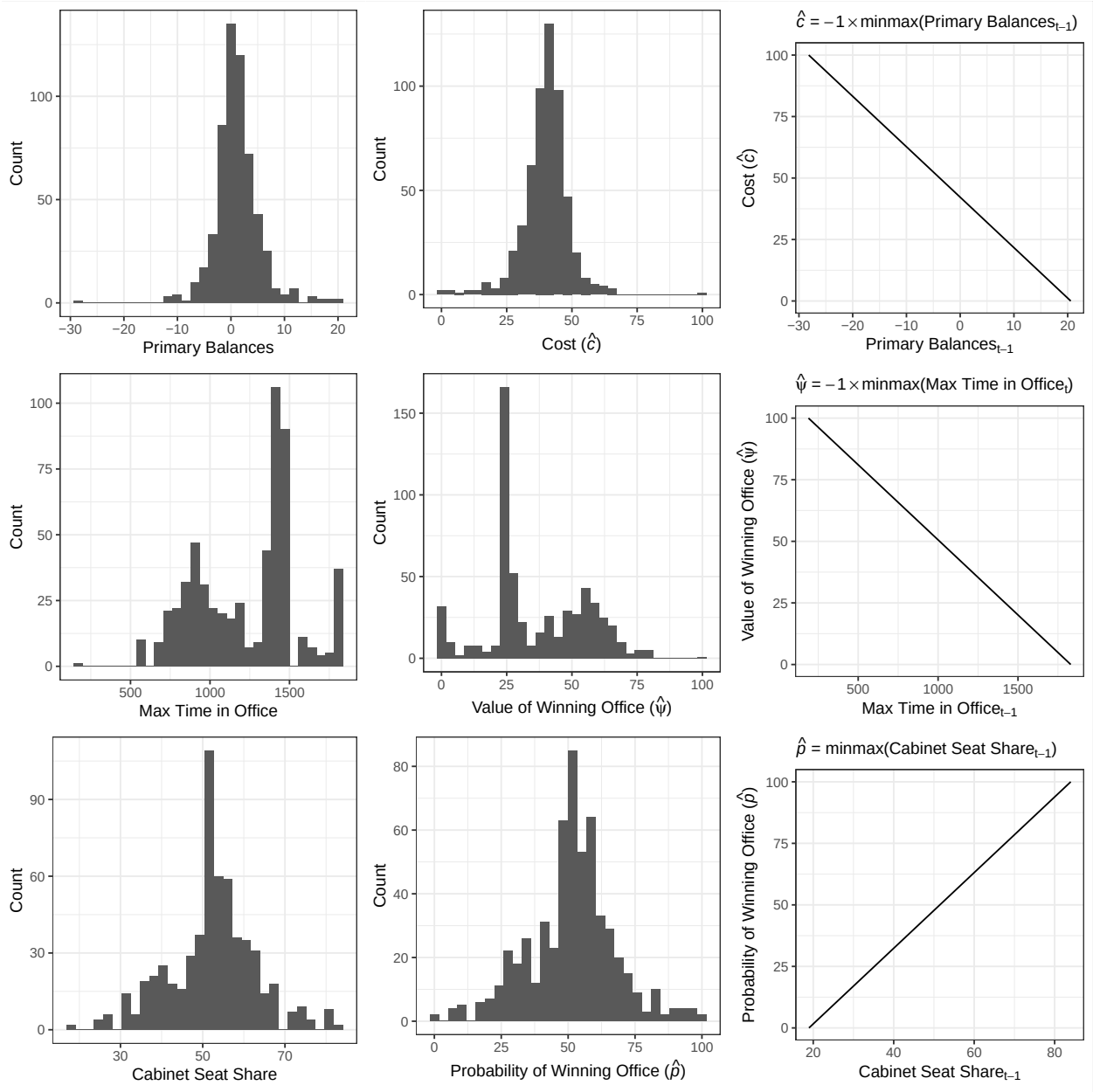

Figure 8: To measure the theoretical quantities in Figure 5, I collected data for each country-year on primary balances (top row), the maximum time the cabinet can stay in office (middle row), and the seat share held by cabinet parties in the lower house (bottom row). I then transformed these variables by minmax normalizing each and reversing the primary balance and max time in office variables. Reversing these two variables allows for observed increases across all three to have the same interpretation in terms of the theoretical willingness to collude.

4.2.4 Empirical Model

Using the variables described above, I run the following model with data on a total of 20 European countries from 1990 to 2019.[2] To capture how relatively equal probabilities of the parties winning makes collusion most likely, I square the cabinet seat measure in the model.

$$\begin{aligned}
\text{Total Spending}_{it} = {} & \alpha_0 \text{Total Spending}_{it-1} + \beta_1 \text{Import Penetration}_{it-1} \\
& + \beta_2 \text{Primary Balances}_{it-1} \text{ Cost } (\hat{c}) \\
& + \beta_3 \text{Max Time in Office}_{it} \text{ Payoff from Winning } (\hat{\psi}) \\
& + \beta_4 \text{Cabinet Seat Share}_{it-1} \text{ Pr. of Inc. Winning } (\hat{p}) \\
& + \beta_5 (\text{Cabinet Seat Share}_{it-1})^2 \\
& + \beta_6 \text{Import Penetration}_{it-1} \times \text{Primary Balances}_{it-1} \\
& + \beta_7 \text{Import Penetration}_{it-1} \times \text{Max Time in Office}_{it} \\
& + \beta_8 \text{Import Penetration}_{it-1} \times \text{Cabinet Seat Share}_{it-1} \\
& + \beta_9 \text{Import Penetration}_{it-1} \times (\text{Cabinet Seat Share}_{it-1})^2 \\
& + \text{Ideology}_{it} + \varepsilon_{it}
\end{aligned}$$

I also present unit or country fixed effects and two-way fixed effects models in my results. For all three models I include a control for ideology of the government, Ideology_{it} (Doring and Manow 2024). Most independent variables in my model are lagged one time period since my theory implies that political elites make binding promises on compensation during an election. However, the variable for time in office is not lagged since elites should know how long the next cabinet would last absent early elections.

After running the above model, I evaluate my hypotheses by evaluating the marginal effect

[2]The 20 countries are: Belgium, Czechia, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Latvia, Netherlands, Norway, Poland, Portugal, Slovenia, Spain, Sweden, United Kingdom.

of import penetration at different hypothetical values of the conditions for tacit collusion. I extract the estimated coefficients and plug them into the formula for the marginal effect of import penetration and the variance of the marginal effect of import penetration (see Clark and Golder 2023). More specifically, to evaluate my hypotheses I assess the marginal effect when all three of the conditions are at 0, then at 1, and so on until they are all very high (i.e., 100). I do the same thing for the variance of the marginal effect and plot the estimated marginal effect and its standard error. The results of this process are shown in Figure 9 while the full results are shown in Table 3.

$$\begin{aligned}\text{ME}[\text{Import Penetration}_{it-1}]) &= \frac{\partial \text{ Total Spending}_{it}}{\partial \text{ Import Penetration}_{it-1}} \\ &= \beta_1 + \beta_6 \hat{c}_{it-1} + \beta_7 \hat{\psi}_{it-1} + \beta_8 \hat{p}_{it-1} + \beta_9 (\hat{p})^2_{it-1}\end{aligned}$$

$$\begin{aligned}V\Big(\text{ME}[\text{Import Penetration}_{it-1}]\Big) = {} & V[\beta_1] + 2c\text{Cov}[\beta_1, \beta_6] + 2\psi\text{Cov}[\beta_1, \beta_7] + 2p\text{Cov}[\beta_1, \beta_8] + \\ & 2p^2\text{Cov}[\beta_1, \beta_9] + c^2 V[\beta_6] + 2c\psi\text{Cov}[\beta_6, \beta_7] + 2p\text{Cov}[\beta_6, \beta_8] + \\ & 2cp^2\text{Cov}[\beta_6, \beta_9] + \psi^2 V[\beta_7] + 2\psi p\text{Cov}[\beta_7, \beta_8] + 2\psi p^2\text{Cov}[\beta_7, \beta_9] + \\ & p^2 V[\beta_8] + 2p^3\text{Cov}[\beta_8, \beta_9] + p^4 V[\beta_9]\end{aligned}$$

5 Results

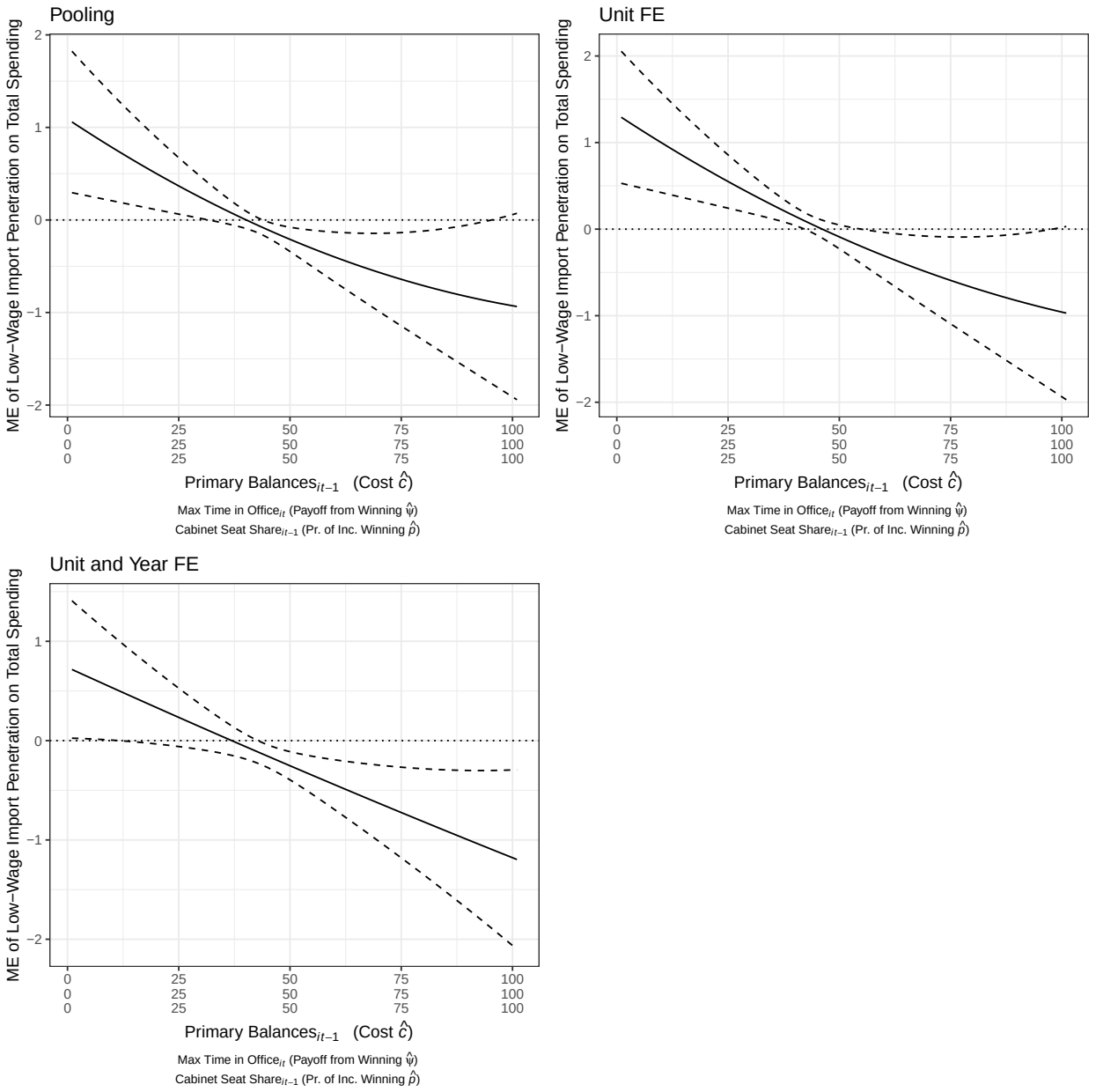

Figure 9: Analysis.

I interpret these results as evidence for both the compensation and collusion hypotheses. When the measures of the conditions for tacit collusion that make collusion possible are weak, the marginal effect of import penetration on total spending is positive. When the measures of the conditions for tacit collusion are strong, collusion becomes more theoretically

Table 3: The Marginal Effect of Import Penetration (% of Consumption) on Total Public Social Spending (% of GDP)

	Total Spending$_{it}$		
	(1)	(2)	(3)
Total Spending$_{it-1}$	0.947***	0.762***	0.758***
	(0.013)	(0.027)	(0.026)
Import Penetration$_{it-1}$	1.059***	1.292***	0.716**
	(0.389)	(0.388)	(0.352)
Primary Balances$_{it-1}$ (Cost, $\hat{c}$)	0.035**	0.065***	0.052***
	(0.015)	(0.017)	(0.016)
Max Time in Office$_{it}$ (Payoff from Winning, $\hat{\psi}$)	0.017***	0.024***	0.020***
	(0.005)	(0.006)	(0.005)
Cabinet Seat Share$_{it-1}$ (Pr. of Inc. Winning, $\hat{p}$)	0.029	0.052**	0.034
	(0.026)	(0.026)	(0.023)
(Cabinet Seat Share$_{it-1}$)^2	−0.0003	−0.0005*	−0.0003
	(0.0003)	(0.0002)	(0.0002)
Ideology$_{it}$	0.028	0.043	0.048
	(0.044)	(0.044)	(0.038)
Import Penetration$_{t-1}$× Primary Balances$_{it-1}$	−0.015**	−0.014**	−0.013**
	(0.006)	(0.006)	(0.006)
Import Penetration$_{t-1}$× Max Time in Office$_{it}$	−0.003*	−0.005***	−0.004**
	(0.002)	(0.002)	(0.002)
Import Penetration$_{t-1}$× Cabinet Seat Share$_{it-1}$	−0.013	−0.014	−0.003
	(0.009)	(0.009)	(0.008)
Import Penetration$_{t-1}$× (Cabinet Seat Share$_{it-1}$)^2	0.0001	0.0001	0.00001
	(0.0001)	(0.0001)	(0.0001)
N×T	20×(16-24)=429	20×(16-24)=429	20×(16-24)=429
Unit FE	No	Yes	Yes
Year FE	No	No	Yes
R^2	0.934	0.761	0.758
F Statistic	534.202***	114.941***	106.974***

Note: *p<0.1; **p<0.05; ***p<0.01

possible and the marginal effect of import penetration is null or sometimes negative.

I conduct the same procedure but calculate the variance of the marginal effect using panel Newey-West standard errors for serial correlation. The results are presented in Figure 11 in the Appendix, section 7.5. In general, the results are unchanged in that the marginal effect of import penetration is positive when the conditions for tacit collusion are weak but becomes null when the conditions for tacit collusion are strong.

6 Discussion and Conclusion

In conclusion, I have argued that it is puzzling why political elites have failed to compensate the losers of globalization. It has been well-known both what the effects of globalization would be and how compensation can lead to Pareto gains under free trade. By failing to compensate the losers, incumbent political elites have made themselves vulnerable to a backlash against globalization from the right.

I argue that compensation failure can be explained by political elites refusing to compete over compensation. When the elites that partition the political sample space for voters take the same position on an issue, it ceases to be a factor in deciding who to vote for. If both an incumbent and challenger party promise the same policy on an issue during an election, then no matter who is elected the policy on that issue will be the same. Thus, rational voters will cast their votes based on the issues where political competitors differentiate themselves. This would explain why- even if voters demand more compensation- compensation failure can occur. If political elites adopt the same position of free trade with little compensation, voters have no one to vote for that could implement more compensation. They will then vote on other issues where elites have different policy positions.

I developed a simple formal model to demonstrate that it is rational for political elites to adopt similar positions on the issue of compensation when compensation is particularly costly, the payoff from a one-shot election win is not prohibitively large, and the political

incumbent and challenger have relatively equal chances of winning the election. In this case, it is possible for elites to improve their utility by competiting over less costly issues and adopting the same policy on compensation.

I evaluated the implications of my model using observational panel data on 20 European countries from 1990-2019. Evaluating the marginal effect of import penetration on total spending as the conditions implied by my formal model varied, I found that when these conditions were weak import penetration is associated with greater total spending or compensation as predicted. When these conditions were strong- implying that is more possible for political elites to rationally adopt similar positions on compensation and incur compensation failure- import penetration is no longer associated with increases in total spending or compensation. Thus, there is evidence that compensation failure does not occur when elites cannot rationally offer the same policies on compensation but does occur when they can rationally do so, as my theory implies.

7 Appendix

7.1 Milner Extension Results

Below are the results from replicating Milner (2021). I only focus on model 3 from the original paper (the third column from Tables 1 and 2) because it is the simplest model (OLS) that also includes the author's preferred set of controls. Note that the observations are significantly reduced from missingness (see footnote 1). The models include country-year fixed effects and robust standard errors clustered at the regional level, as in the original paper.

Table 4: Milner Extension Results. LDV omitted for space considerations.

	Dependent variable:			
	Right Populist	Left Populist	Main Left	Main Right
	(1)	(2)	(3)	(4)
China Shock	42.990***	18.930**	−44.320***	−83.731***
	(15.238)	(7.991)	(12.830)	(19.342)
FDI Shock	−2.082	4.537**	−22.808***	5.707
	(2.776)	(2.068)	(3.499)	(3.549)
Immigration Shock	0.306	−9.133	−15.716	24.720*
	(16.747)	(13.089)	(42.240)	(13.016)
Robot Shock	0.311	−4.092	−7.205*	7.406
	(3.545)	(3.259)	(3.683)	(4.919)
RTI Region	1.103	2.734	6.977	−0.267
	(3.918)	(2.545)	(5.054)	(4.810)
Spending_{t-1}	0.493	0.567***	−5.032***	−4.945***
	(0.612)	(0.195)	(0.872)	(0.964)
China Shock × Spending_{t-1}	−1.767***	−0.882***	1.832***	3.207***
	(0.598)	(0.333)	(0.512)	(0.759)
Constant	0.015	2.514	139.853***	130.024***
	(15.760)	(6.129)	(25.472)	(26.171)
N=12	N×T=480	N×T=480	N×T=480	N×T=480
Adjusted R^2	0.815	0.900	0.827	0.857
F Statistic	54.983***	111.462***	59.640***	74.642***
Note:				*p<0.1; **p<0.05; ***p<0.01

7.2 Solving for Inequality (1)

$$
\begin{aligned}
(1-\delta)\Big(\big(p\psi,(1-p)\psi\big)(1+\delta+...+\delta^{\infty})\Big) &\geq (1-\delta)\Big(\big(\psi,\psi\big)(1) \\
&\quad + \big(p(\psi-c),(1-p)(\psi-c)\big)(\delta+...+\delta^{\infty})\Big) \\
(1-\delta)\Big(\big(\frac{p\psi}{1-\delta},\frac{(1-p)\psi}{1-\delta}\big)\Big) &\geq (1-\delta)\Big(\big(\psi,\psi\big)+\big(\frac{\delta p(\psi-c)}{1-\delta},\frac{\delta(1-p)(\psi-c)}{1-\delta}\big)\Big) \\
\big(p\psi,(1-p)\psi\big) &\geq (1-\delta)\Big(\psi+\frac{\delta p(\psi-c)}{1-\delta},\psi+\frac{\delta(1-p)(\psi-c)}{1-\delta}\Big) \\
\big(p\psi,(1-p)\psi\big) &\geq \big(\psi-\psi\delta+\delta p(\psi-c),\psi-\psi\delta+\delta(1-p)(\psi-c)\big) \\
\big(\psi\delta-\delta p(\psi-c),\psi\delta-\delta(1-p)(\psi-c)\big) &\geq \big(\psi-p\psi,\psi-(1-p)\psi\big) \\
\Big(\delta\big(\psi-p(\psi-c)\big),\delta\big(\psi-(1-p)(\psi-c)\big)\Big) &\geq \big(\psi-p\psi,\psi-(1-p)\psi\big) \\
(\delta_I^*,\delta_{Ch}^*) &\geq \Big(\frac{\psi-p\psi}{\psi-p(\psi-c)},\frac{\psi-(1-p)\psi}{\psi-(1-p)(\psi-c)}\Big)
\end{aligned}
$$

7.3 Folk Theorem

Denote the minmax value of player i as $\bar{v}_i$, where $\bar{v}_i = \min_{s_{-i}\in S_{-i}}\max_{s_i\in S_i}U_i(s_i,s_{-i})$.[3] In words, the minmax value is the result of player $-i$ choosing the strategy (s_{-i}) that gives player i the smallest of their best response payoffs $(\max_{s_i\in S_i}U_i(s_i,s_{-i}))$.

$$
\begin{aligned}
\bar{v}_I &= \min_{s_{Ch}\in S_{Ch}}\max_{s_I\in S_I}U_I(s_I,s_{Ch}) \\
&= \min_{s_{Ch}\in S_{Ch}}\{\psi,p(\psi-c)\} \\
&= p(\psi-c)
\end{aligned}
$$

[3](Maschler, Solan, and Zamir 2020, 112)

$$\begin{aligned}\bar{v}_{Ch} &= \min_{s_I \in S_I} \max_{s_{Ch} \in S_{Ch}} U_{Ch}(s_{Ch}, s_I) \\ &= \min_{s_I \in S_I} \{\psi, (1-p)(\psi - c)\} \\ &= (1-p)(\psi - c)\end{aligned}$$

Denote a payoff as x and the set of players as N. The set of "individually rational" payoffs is denoted as V, where $V = \{x_i \geq \bar{v}_i \ \forall \ i \in N\}$.[4] V is simply the list of each individual's payoff that is greater than or equal to their minmax value. For this game, $V = \{p(\psi), \psi_I, p(\psi - c), (1-p)\psi, \psi_{Ch}, (1-p)(\psi - c)\}$.

Denote the set of feasible payoffs as F, where $F = \text{conv}\{U(s), s \in S\}$.[5] It is the smallest vector of numbers that contains the pair of payoffs for each strategy in the game. In this game, it is simply the list of payoff pairs for each action: $F = \{\Big(p(\psi, (1-p)\psi)\Big), \Big(0, \psi\Big), \Big(\psi, 0\Big), \Big(p(\psi - c), (1-p)(\psi - c)\Big)\}$.

Thus, the set of individually rational and feasible payoffs is $F \cap V$, also known as W (see Figure 5).[6]

[4](Maschler, Solan, and Zamir 2020, 538)
[5](Maschler, Solan, and Zamir 2020, 538)
[6](Maschler, Solan, and Zamir 2020, 548)

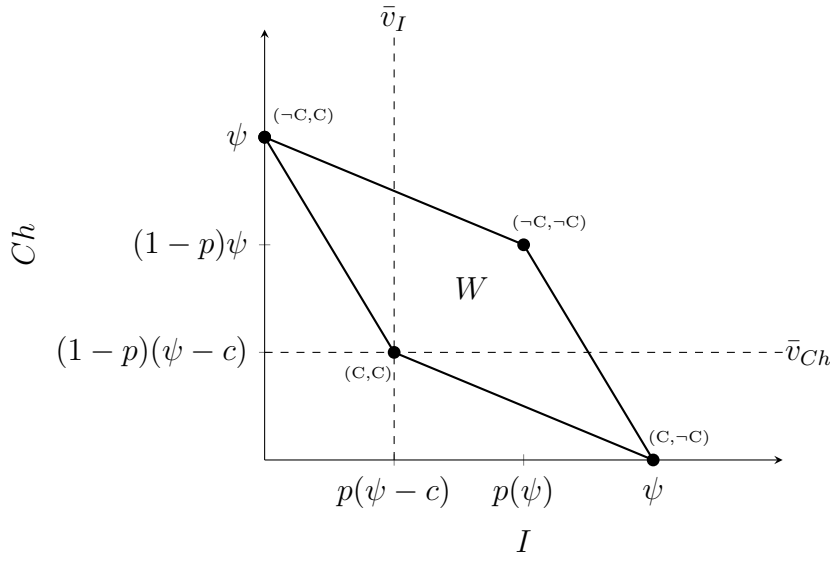

Figure 10: W is the set of payoffs that can be approximated in equilibrium via the Folk Theorem.

7.4 Variance of the Marginal Effect

The derivation of the variance of the marginal effect is given below:

$$
\begin{aligned}
\mathbb{V}[\frac{\partial \text{ Total Spending}_{it}}{\partial \text{ Import Penetration}_{it}}] &= \mathbb{V}[\beta_1 + \beta_6 c_{it-1} + \beta_7 \psi_{it} + \beta_8 p_{it-1} + \beta_9 p_{it-1}^2] \\
&= \mathbb{E}\Big[\Big((\beta_1 + \beta_6 c_{it-1} + \beta_7 \psi_{it} + \beta_8 p_{it-1} + \beta_9 p_{it-1}^2) \\
&- \mathbb{E}[\beta_1 + \beta_6 c_{it-1} + \beta_7 \psi_{it} + \beta_8 p_{it-1} + \beta_9 p_{it-1}^2]\Big)^2\Big] \\
&= \mathbb{E}\Big[\Big(1(\beta_1 - \mathbb{E}[\beta_1]) + c(\beta_6 - \mathbb{E}[\beta_6]) + \psi(\beta_7 - \mathbb{E}[\beta_7]) + p(\beta_8 - \mathbb{E}[\beta_8]) \\
&+ p^2(\beta_9 - \mathbb{E}[\beta_9])\Big)^2\Big] \\
&= V[\beta_1] + 2c\text{Cov}[\beta_1, \beta_6] + 2\psi\text{Cov}[\beta_1, \beta_7] + 2p\text{Cov}[\beta_1, \beta_8] \\
&+ 2p^2\text{Cov}[\beta_1, \beta_9] + c^2 V[\beta_6] + 2c\psi\text{Cov}[\beta_6, \beta_7] + 2p\text{Cov}[\beta_6, \beta_8] \\
&+ 2cp^2\text{Cov}[\beta_6, \beta_9] + \psi^2 V[\beta_7] + 2\psi p\text{Cov}[\beta_7, \beta_8] + 2\psi p^2\text{Cov}[\beta_7, \beta_9] \\
&+ p^2 V[\beta_8] + 2p^3\text{Cov}[\beta_8, \beta_9] + p^4 V[\beta_9]
\end{aligned}
$$

7.5 Robust Results (Panel NW Standard Errors)

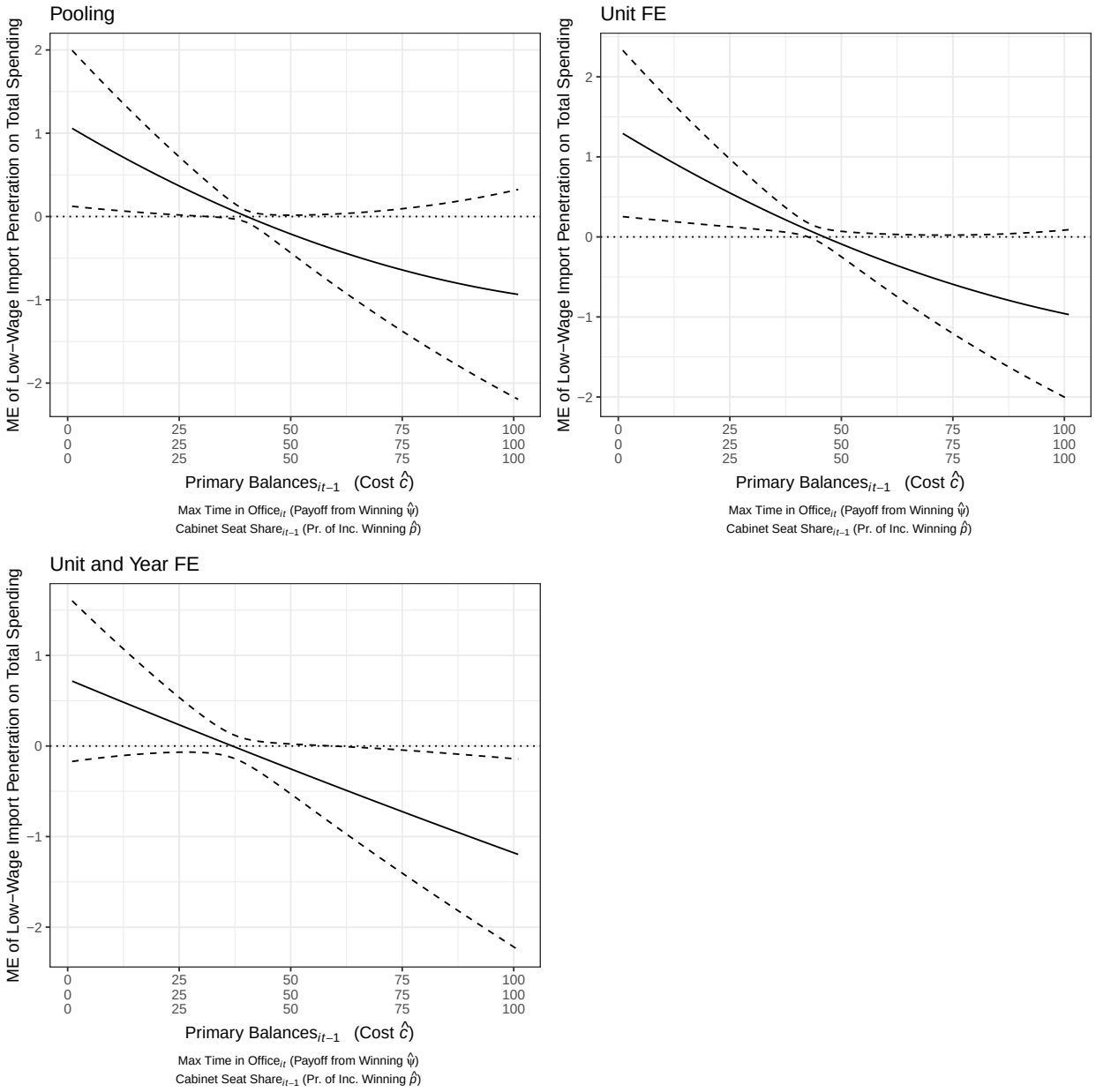

Figure 11: Analysis Robust.

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