# The Political Economy of Inefficient Trade Policy

by

Jason Sanwalka Davis

A dissertation submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy
(Political Science)
in The University of Michigan
2018

Doctoral Committee:

      Professor Robert J. Franzese, Co-Chair
      Professor James D. Morrow, Co-Chair
      Professor Alan V. Deardorff
      Assistant Professor Iain Osgood

jasonsd@umich.edu
Orcid iD - 0000-0002-1700-6746

# ACKNOWLEDGEMENTS

Writing acknowledgements is always a bit of a minefield, since it's inevitable I will leave someone important out. This isn't just a hypothetical concern for me either; on most occasions in the past where I have had occasion to make public acknowledgements of this sort, I have spent the time immediately afterwards apologizing to people who were inexplicably and unjustly omitted, with no excuse but my own incompetence. But in the spirit of this dissertation, it seems that acknowledging some subset should be a Pareto-improvement. So here goes!

Rob Franzese has been a great help not only with the dissertation, but has managed a continuous stream of administrative tasks that I have thrown his way (dozens of conference grant letters, paperwork for visa applications, etc.). Perhaps more substantively, the way I think about the social scientific enterprise has been profoundly influenced by my classes and conversations with Rob, including the time he allowed me to TA for his ICPSR class despite my having no knowledge of any of the material at the time. I imagine I will always be pretty EMTI-headed because of Rob.[1]

Jim Morrow has long been a model of good political science scholarship for me, both before and after I arrived at Michigan (indeed, my coming to Michigan was hardly independent of his being here). This has become even more true as my work has come to emphasize applications of formal theory. He also is one of those

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[1]EMTI = Empirical Models of Theoretical Intuitions, and pronouncing it like "empty" is Rob's joke, and therefore I cannot be held accountable for it.

people who, maddeningly, seems to know almost everything about everything, and I have learned a lot from him both in classes, personal conversations, and from his various political stories about Singapore, Stalinist purges, and whatnot. There is also no one who has had a deeper impact on my understanding of the broader field of international relations.

Since arriving at Michigan during my second year in the program, Iain Osgood has consistently invested more time in me and my work than what seems incentive compatible, and has put up with more disorganization and logistical mistakes from me than he ever should have had to. His detailed comments on multiple drafts of everything I have sent him over the years, and long conversations with me in his office have dramatically improved the quality of my work. Even his "mild chastisement", as he once put it, has been very helpful (I'll try to keep more regular hours, Iain). I am very grateful for whatever mathematical errors must have led him to these poor investment decisions.

Alan Deardorff is a deeply insightful scholar who has been very helpful to me in the past, giving extremely detailed and helpful comments on the first paper of this dissertation back in 2014, and teaching half of the trade theory course that I took and did poorly in a number of years back. I have learned a lot from him, and one of my biggest regrets from the program is not exploiting his intellect more in the interim years. With any luck (and Alan's consent), I will rectify that in the years to come.

Skip Lupia was like a de facto committee member for me, serving on my first and second year review committees as well as my methods prelim committee, giving advice on fellowship proposals, and providing comments and advice on numerous papers that I've worked on over the years. I also have learned an immeasurable

amount from him about the epistemology of theoretical models, which has had a huge impact on how I write papers. He has also taught me a lot about how to present better (my job talk, for instance, was entirely rewritten after consulting with him), though I'm not about to try delivering any silent presentations any time soon.[2]

Barb Koremenos was one of the first to read one of the earliest drafts of the second paper of this dissertation and provided a lot of much appreciated comments and encouragement. She also served on my 'World Politics' prelim committee, and has generally been a very supportive presence over my time in the program.

Bill Clark absconded for Texas at the end of my second year, but had a big impact on me earlier in my time as a graduate student, providing me with a lot of wisdom (for lack of better word) that has stuck with me as I've continued to pursue life as an academic. He has also continued to be a source of significant insight and good company whenever I've seen him since. You are missed here, Bill!

Joe Ornstein, or Jornstein as he prefers to be called, has been a close friend and reliable source of good advice since he arrived here in my second year at Michigan. His daughter, Fiona, is my favorite small person. That's not especially relevant to the dissertation, but I'm pretty sure Rackham will let me write whatever I want here?

Alton Worthington has provided a lot of very helpful comments on my work over the years (all the papers in this dissertation I think?), including taking the time to work through my practice job talk with me in a way that made it much better.

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[2]See `https://www.youtube.com/watch?v=0QIAkneP-js`

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# ABSTRACT

While political scientists have often noted that trade protection is an inefficient way of redistributing income between parties, given that it destroys value relative to other redistributive mechanisms (such as domestic taxation), such scholars have not devoted much attention to grappling with the implications of this claim. This dissertation comprises three papers addressing the *political* implications of protection's inefficiency. Descriptions of these papers are as follows.

**Protection as a Commitment Problem**: In this paper, I develop a dynamic model that demonstrates that commitment problems in the trade-lobbying process can account for the use of protection over more efficient means of redistribution. Many industries that are harmed by open trade have an incentive to lobby for protection over compensatory transfers because free trade has dynamic effects that reduce an industry's ability to lobby the government in the future. Thus, while both parties would prefer permanent transfers to protectionism, these transfers are subject to a commitment problem. I also explore the conditions under which efficient transfers may still be an important part of political bargains supporting freer trade. This paper therefore resolves an outstanding theoretical puzzle about the inefficiency of trade protection as a redistributive instrument, and provides a new interpretation of the compromise of "embedded liberalism".

**Screening for Losers**: In this paper, I identify a new way in which trade institutions and their particular features can be valuable to governments: namely, that they can provide useful information about domestic political groups. While governments are responsible for the administration of most legal trade-related actions, the information that governments need to determine which actions to pursue is often the private information of the firms and interest groups that are lobbying for these actions, and there are significant incentives for such groups to misrepresent this information. This paper uses a formal model to demonstrate that governments can use the multitude of legal options available to them to screen between domestic groups for those with the strongest cases. This selection process can help to explain, amongst other things, why disputes pursued via the WTO have such a high rate of success (approximately 90%), and why trade remedies tend to be structured around meeting criteria instead of as "efficient breaches" requiring compensation.

**Taxability and Trade Policy**: The political economy of trade literature tends to conceive of the relationship between fiscal capacity and trade policy fairly simply: states that have limited fiscal capacity will be more likely to use tariffs to raise revenues given the lack of other means of doing so. This paper presents a model that complicates this story; what matters is not just overall levels of fiscal capacity, but the relative taxability of different domestic groups. In particular, while greater ability to tax the winners of freer trade makes freer trade more likely, greater ability to tax the losers of freer trade may actually make protectionism more likely. This follows because governments can use taxation to redistribute the revenues generated by any policy to better respond to the distributive politics game they

face, provided that the revenues accrue to a party that is taxable. This generates a number of empirical implications for patterns of trade policy: for instance, we would expect trade policy to be biased towards factors, industries, and firm sizes that are easier to tax.

# CHAPTER I

# Introduction

Political economists have provided many explanations for why governments might want to redistribute income between groups, but far fewer for why redistribution is often carried out via inefficient means. Trade protection, for instance, is often explained through its distributive consequences (who benefits from having their goods protected?), but this begs the question: why not redistribute via the tax system instead, which would increase the "size of the pie" to be distributed, such that everyone could be made better off?

Indeed, not only have economists long argued that "compensating the losers" is generally a better economic strategy than protectionism, but the core idea that trade produces overall benefits but also hurts specific groups characterizes the conventional wisdom in the broader intellectual conversation about international trade, even amongst non-academics. Shortly before the 2016 presidential election in the United States, the New York Times published a nearly 5000-word front page article entitled "More Wealth, More Jobs, but Not for Everyone: What Fuels the Backlash on Trade", in which they interviewed figures ranging from steel workers to foreign cabinet ministers, all of whom seemed to accept the basic premise that

trade produces gains, but not everyone gets access to those gains.[1] As one dock worker quoted in the article put it:

> "More global trade is a good thing if we get a piece of the cake. But that's the problem. We're not getting our piece of the cake."

Why do governments so often fail to redistribute these shares of the global trade "cake" in a way that would prevent the kind of backlash against trade that we are observing today? Unlike the conflict literature in international relations (Fearon 1995, Powell 2004, Powell 2006) - which has been transformed since the mid-1990s by the insight that war is costly and thus explanations for war must account for why states cannot agree to bargains that avoid these costs - the international political economy of trade literature has almost entirely neglected the ways in which the value-destroying properties of trade protection inexorably change the structure of the game. The three papers comprised in this dissertation serve as useful corrective to this oversight, by providing insight into how inefficiency matters - not just for understanding the economics of trade, but for understanding the *politics*.

In the conflict literature, three categories of explanations have been provided for why war might occur despite the fact that it is costly: commitment problems, information problems, and indivisibility problems. The three papers in this dissertation mirror this, with the first paper addressing commitment problems in trade, the second paper discussing the private information of trade interest groups participating in the lobbying process, and the third paper discussing limits on the ability to transfer value between specific parties after a trade policy is implemented, which is another way of characterizing indivisibility problems. Descriptions of

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[1]September 26, 2016. The New York Times.

these three papers are as follows.

## Protection as a Commitment Problem

In this dissertation paper, I address the inefficiency of trade protection by developing a dynamic model that demonstrates that commitment problems in the trade-lobbying process can lead interest groups to prefer costly protectionism over more efficient means of compensation. When a country eliminates barriers to trade, uncompetitive industries are necessarily disrupted: inefficient firms are driven out of business, the remaining firms lose profits, and workers leave to find employment in other industries. However, size, profitability, and organization are all essential to interest group influence. Thus, while all parties might prefer permanent compensatory transfers to continued protection, interest groups do not pursue these because they are aware that the government will not have an incentive to maintain them after trade liberalization reduces these groups' political influence.

Despite these constraints, the model predicts that compensation can still sometimes be an important part of political bargains leading to freer trade, and the model also generates predictions about how and when this likely to occur. In particular, compensation should be short term, and especially likely to be given to industries where the welfare distortion costs of protection are high (due to high import demand elasticities), where the political costs of protection are high (due to downstream industries who are harmed by higher cost input goods), or when the prospective decline in influence for the affected groups is relatively limited. Thus, this paper challenges a popular narrative that suggests that compensation programs - like Trade Adjustment Assistance (TAA) in the USA - are often too lim-

ited to make any difference. Instead, the model demonstrates that while politics can constrain the use of compensation, even the limited forms of assistance that are possible can be pivotal in moving a country from a protectionist equilibrium to one of open trade.

## Screening for Losers: Trade Institutions and Information

The second dissertation paper notes that because trade protection is inefficient, it is a "negative sum good", in the sense that providing it to one group reduces the total amount of resources that can be distributed. As a result, governments are often best served by protecting only a subset of politically important groups that are harmed by trade competition, such as those that are harmed the most severely, or those that are facing "unfair" competition from firms abroad. However, these characteristics are often known only to the groups in question, who benefit unconditionally from greater protection, giving them an incentive to misrepresent their situation in order to obtain as much protection as possible.

This paper presents a screening model that demonstrates that governments can use different institutional forums and different instruments within an institution to get interest groups to credibly reveal this information. This can help explain the high success rate of WTO cases (approximately 90%), the prevalence of weak lawsuits pursued via investor-state dispute settlement (ISDS) provisions, and demonstrates another way in which international institutions and their particular features can be valuable to governments, namely their potential for providing governments with useful information about domestic political groups.

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## Taxability and Trade Policy

The political economy of trade literature tends to conceive of the relationship between fiscal capacity and trade policy fairly simply: states that have limited fiscal capacity will be more likely to use tariffs to raise revenues given the lack of other means of doing so. The third paper of this dissertation presents a model that complicates this story; what matters is not just overall levels of fiscal capacity, but the relative taxability of different domestic groups. In particular, while greater ability to tax the winners of freer trade makes freer trade more likely, greater ability to tax the losers of freer trade may actually make protectionism more likely. This follows because governments can use taxation to redistribute the revenues generated by any policy to better respond to the distributive politics game they face, provided that the revenues accrue to a party that is taxable. This generates a number of empirical implications for patterns of trade policy: for instance, we would expect trade policy to be biased towards factors, industries, and firm sizes that are easier to tax.

Moreover, this paper provides a new explanation for the inefficiency puzzle described at the outset of this dissertation. While trade produces aggregate gains, political bargains can break down if the government is limited in its ability to redistribute some of the gains from the winners of trade to the losers. This could happen for any number of reasons, including the ability of large firms to relocate to avoid taxation, or the inability of the government to enforce taxation in the informal sector. Thus, this paper not only explains variation in trade policy, but provides a new rationale for why protectionist policy would be used at all.

# Protection as a Commitment Problem

## Introduction

Existing accounts of protectionism in the political economy literature have tended to focus on the redistributive consequences of trade policies. Broadly, this approach suggests that if the groups that benefit from trade protection are more politically influential than those that lose, we should expect governments to impose restrictions on trade. However, even if we accept the premise that trade policy is primarily a way of redistributing income, it remains unclear why the actors in a redistributive game would choose protection as the *means* for redistributing income over any number of alternatives available to the government. Indeed, there are strong theoretical reasons to believe that protection should be one of the least attractive options.

Consider that governments generally have many mechanisms for transferring income that are more efficient than trade protection - lump sum transfers, tax credits, adjustment assistance, etc. - which would increase the size of the gains being bargained over. If these mechanisms were used instead of protection, transfers could be made to specific groups that completely compensate those groups for any losses

they would suffer under free trade, while entailing lower deadweight losses than tariffs that provide an equivalent degree of redistribution. This should produce a surplus that could be allocated so as to make all parties better off than they were under protection. This creates a puzzle that is analogous to that discussed by conflict scholars about the inefficiency of war[1] - if Pareto-superior agreements are available to the actors in the trade policy game, why do we ever see protectionism?

Complicating the story is that while protection is used regularly by governments as a means of supporting influential groups, so are more efficient means of compensating these groups. The "embedded liberalism" literature has consistently found empirical support for the idea that compensation is used by governments in a way that increases support for freer trade (Ruggie 1982, Hays et al. 2005, Walter 2010, Margalit 2011). However, this literature leaves several questions unaddressed: who are the actors who receive this welfare-based compensation? Under which conditions will this bargain be effective in obtaining freer-trade, and under which will it falter? Why, if this is true, did we see a partial reversal of this bargain with reductions in the size of the welfare state in the 1980s, even as global economic openness increased dramatically? More generally, what accounts for the highly heterogeneous use of compensation and protection across sectors, industries, states, and time?

I develop a dynamic model that can help address both of these puzzles. The model identifies that interest groups that are harmed by the opening up of trade can have an incentive to lobby for protection over compensatory transfers because

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[1]Fearon 1995, for instance.

free-trade has dynamic effects (reduced profits, shrinking employment, disrupted interest group cohesion, etc.) that lead to a reduced ability to lobby the government in future periods. Given this, interest groups that could at one time extract favorable policy from the government may lose that political influence after the move to free trade. Thus while both parties would prefer permanent compensatory transfers to protectionism, interest groups know that if they pursue them, governments will lose the incentive to maintain these transfers in the future - in other words, these transfers are subject to a commitment problem.

However, while these dynamic effects make protection more attractive than it would have been otherwise, they are not always pivotal in the choices of interest groups. Protection becomes especially costly for the government to provide when the good in question is subject to high import demand elasticities (which increase deadweight losses from protection) and high lobby competition from downstream industries (such as when automobile manufacturers lobby against steel tariffs). Moreover, states vary in the degree to which they have alternative means of compensating interest groups (states with high fiscal capacity can do this more easily), and interest groups face differing degrees of dynamic decline in the face of open trade (some groups may retain most of their political influence, while some interest groups may face complete dissolution in the face of import competition). The model illustrates how compensation may thus still be chosen by interest groups when various factors either make protection more costly to obtain or compensation more attractive.

Consequently, the model can improve our understanding of trade politics in two

ways. First, it helps resolve a theoretical puzzle about the inefficiency of protection as a means of redistributing income: Pareto-improving bargains should exist, but these are not politically feasible due to commitment problems in the trade lobbying process. Second, the model develops an alternative theoretical foundation for the compensation story outlined by the embedded liberalism literature, in a way that can better account for its heterogeneity: compensation can indeed be an important part of a political bargain obtaining free trade, but only when states possess sufficient capacity to implement alternative means of redistributing income, and when import competing groups find protection more costly to obtain than it's worth (due to high import demand elasticities and political competition, or relatively low prospective rates of political decline).

## Overview of the Literature

A primary goal of the political economy of trade literature has been to identify the winners and losers of trade. For instance, this body of work has been useful for advancing our understanding of the conditions under which trade-related political divisions will be along factor (as suggested by Heckscher-Ohlin) or industry (as suggested by Ricardo-Viner) lines (Rogowski 1990, Scheve and Slaughter 2001, Hiscox 2002, Mayda and Rodrik 2005), or the conditions under which you may have divisions within industries between firms (Osgood 2016, Kim 2017). Other characteristics identified by this literature as important determinants of trade preferences include housing asset values (Scheve and Slaughter 2001), the consumption patterns of consumers (Baker 2005), and the interests of exporters (Gilligan 1997, Betz 2017). Peters (2014) looks at how immigration and trade policy

preferences may interact, given that they are in many ways substitute means by which governments can engage in a virtual trade in production factors.

Building on this literature is a body of research that seeks to identify the conditions under which different groups are likely to be politically influential in trade politics. This includes theoretical work on how lobby groups might induce the government to enact trade policies that favor these groups (Grossman and Helpman 1994, Bombardini 2008), empirical work testing the predictions of these models (Goldberg and Maggi 1999, Gawande and Bandyopadhyay 2000, Gawande et al. 2012), as well as work that identifies other factors that might lead to the empowerment of different groups, such as democratization (Mansfield et al. 2000, Milner and Kubota 2005). All of this work fits within an approach to studying trade policy that locates its primary sources in domestic politics (Milner 1997).

However, if trade polices are, as this work suggests, simply a way of redistributing income between groups based on the outcome of political competition, an arguably more fundamental question arises about why these policies are the *mechanism* by which such redistribution is pursued, given that such policies are a more inefficient way of transferring income compared to other alternatives. For instance, tax policy could be used to redistribute income directly to the politically influential groups via lump-sum transfers, tax credits, or other means. While some of these non-trade redistributive mechanisms may also produce deadweight losses, there are undoubtedly (at least in developed countries) some that produce smaller efficiency losses than those created by highly inefficient protectionism, such that using these more efficient mechanisms would increase the size of the "pie" being

bargained over, allowing all parties to benefit. Why then are trade policies used instead?

The political economy of trade literature, while active in identifying this question (see, for instance, Rodrik 1995), has produced few serious attempts to answer it. Indeed, in one of the more prominent reviews of the trade literature, the authors identify this exact puzzle and lament the fact that "in political science, there is no work on this of which we are aware besides the rather suspect 'lack of transparency' argument" (Alt et al. 1996, p. 170). Perhaps surprisingly, this has not changed much in the years since.

Grossman and Helpman (1994) has a paragraph that is dedicated to this question, which argues that special interest groups may benefit from tying the hands of the government. However, their argument is not formally developed (mostly included as an aside to the main argument), and provides very little scope for protectionism except as an unused "threat" that allows special interest groups to extract greater gains from a bargaining game. Kono (2006) is sometimes cited in relation to this question, but it focuses on explaining the move towards non-tariff barriers (NTBs) from tariffs, and does not directly address the question of why protectionism - whether NTBs or tariffs - would be used over more efficient mechanisms for redistributing income.

Dixit and Londregan (1995) addresses a related question - namely, how redistribution can lead to inefficiency - with a distributive politics model that argues that voters that have advantageous political characteristics (e.g. swing voters)

may make inefficient decisions if doing so allows them to retain these characteristics. For instance, voters in politically pivotal flood-prone areas may decide not to move to avoid losing redistributive transfers. However, the model does not address why the *form* of redistribution would be inefficient; indeed, transfers are explicitly modeled as efficient and lump-sum (Dixit and Londregan 1995, p.858).

Some explanations for the phenomenon of inefficient redistribution exist in the political economy literature more generally (e.g. Coate and Morris 1995, Acemoglu 2003, Drazen and Limao 2008), ranging from bargaining models to information asymmetries, but none of these have been applied to international trade specifically. Acemoglu and Robinson (2001) comes closest; they argue inefficient redistribution might be favored by industries if it increases their size and correspondingly their political influence, and while the paper primarily focuses on farm subsidies and labor market policy, they briefly discuss how the model might apply to international trade. Their paper provides valuable insights, but the model is not a natural fit with trade. For instance, the main factor determining whether inefficient redistribution occurs in their paper is whether absolute rents increase quickly enough with group size in order to lead to an increase in per capita rents for the farmers who are around at the beginning of the game; with trade protection, per capita rents are likely always increasing, so this should always be satisfied, allowing very little scope for open trade. Similarly, their model generates comparative statics about factor specificity that are hard to square with the trade literature: they argue that high factor mobility might lead to greater amounts of inefficient redistribution, while the trade literature suggests that high factor mobility shifts the political cleavages associated with protection from industry to factor lines

(why would farmers have an incentive to switch industries if their returns are not diminished?).

In contrast, this paper's model builds off of trade theory to demonstrate how commitment problems arise with trade in particular, using an approach to modeling lobbying in trade that is more consistent with the trade literature (a menu-auction). This allows the model to generate comparative statics relating to measurable trade parameters (like import demand elasticities) and other factors considered important by the trade literature (like competition from downstream industries) (Gawande et al. 2012).

This project also speaks to the literature on "embedded liberalism", which broadly argues for a compensation story in which government spending can be a means of blunting opposition to trade from trade's losers. This literature began by arguing that the post-war expansion of the welfare state was an important example of this kind of compensation (Ruggie 1982). Rodrik 1998 brought statistical evidence to bear on this question, identifying a correlation between public sector size and external openness, which he interpreted as governments insuring voters against "external risk". Later work has continued to find empirical support for the hypothesis that compensation programs can be used to increase support for open trade, using data from trade adjustment assistance in the United States (Margalit 2011), active labor market programs in the OECD (Hays et al. 2005, Hays 2009), and even survey experiments (Ehrlich and Hearn 2014).

However, while this literature has usefully demonstrated that compensation can

be an important part of political bargains on trade, the literature is largely empirical, and does not explore in depth the conditions under which such compensation should be helpful, or which groups are most likely to be successful in obtaining compensation. This paper builds theoretical foundations for these empirical results by developing a model that predicts that both protection and compensation will be used as tools by governments, in a fashion that more closely resembles the heterogeneous mix of policies we see employed today.

Lastly, this paper also contributes to the literature on dynamics in trade policy-making (Bailey et al. 1997, Hathaway 1998). With the two exceptions noted, the political economy of trade literature tends to treat the game as essentially static, when we might realistically expect industries to be forward-looking and subject to change over time in both capacities and interests. By showing that an important puzzle that has troubled political economists for decades can be explained by incorporating trade dynamics, I hope to help draw attention to an important area for further inquiry.

## Trade Dynamics

As noted earlier, in any single period there are clear incentives for both interest groups and governments to pursue the most efficient means possible for transferring income. However, throughout the political science literature, and particularly with respect to the study of war and conflict, we have seen that dynamics can change the story substantially. Powell (2004) identifies a common mechanism at work in a number of important papers with inefficient equilibria, namely that in settings where political power is related to some stochastically realized state of

the world, there can be shifts in political power that render more efficient policy outcomes commitment incredible (see also Powell 2006). While both parties may prefer some policy at some time $t$, at time $t+1$ circumstances may change such that one party gains a temporary advantage and no longer has an incentive to abide by the original agreement.

While this work has centered on stochastic games, the shocks to political power that generate commitment problems need not be the result of some random process. I model the process of liberalization as leading deterministically to a reduction in the political influence of protectionist lobby groups. Moreover, I argue that it is impossible to devise a policy that fully compensates these protectionist groups and maintains their political influence without sacrificing the gains associated with freer trade.

The reason for this is that the dynamic effects that weaken protectionist interest groups arise from the very nature of the economic changes that need to occur in order for liberalization to generate these gains. Consider, first, a subsidy policy designed to prop-up the trade-threatened industry. This policy would likely have the desired effect of redistributing income to the protectionist group, but the main benefits of trade arise when inputs are allowed to relocate from comparative disadvantaged sectors to comparative advantaged sectors. This *requires* the decline of the comparative disadvantage industry; if subsidies are used to prevent this decline, they are performing a similar function as other protectionist measures.

Now consider an alternative compensation policy, where the government provides

income transfers to the individuals associated with a particular industry, but does not tie these transfers to those individuals remaining in the industry. This can be conceptualized as paying these workers to leave the industry in question, so that the process of greater specialization in the face of trade competition can occur. This approach achieves the full gains of trade, but necessarily leads to shrinking size of the industry as workers leave to find employment in other industries, reductions of the producer surpluses of the import-competing firms, and a shifting firm-composition towards exporting firms within import-competing industries. In the most extreme case, this can lead to what amounts to the total dissolution of the industry. In contrast, any domestic interest groups that benefit from trade liberalization grow in size, and obtain higher producer surpluses. All of these changes have political implications for the protectionist groups in question.

To start, insofar as the protectionist interest group is organized around an industry, having a smaller number of members is likely to reduce its political influence. As a general matter, large interest groups tend to be more influential than smaller ones, ceteris paribus (Chong and Gradstein 2010). Second, if the producer surplus of the industry is reduced, the lobby group retains fewer resources with which to make political contributions or fund lobbying activity that might influence the government, particularly if this group faces credit-constraints. Third, because of the shifting firm-composition within an industry, the remaining firms will tend to be weighted towards those that are less resistant to trade. Fourth, because any pro-trade interest groups experience the converse economic effects, a protectionist group now faces greater competition if they try to obtain a rollback to protectionist policies in the future. Thus, we see that liberalization can create "lock-in", where

it becomes more challenging to reverse the process once it has begun, while at the same time the pro-protectionist lobby groups are weakened in their ability to obtain any kind of policy concession, trade-related or not.

An important question is whether or not the compensating income transfers to the trade-distressed workers might, in turn, be used as resources with which to lobby the government for compensation. This is unlikely, for two reasons. Before liberalization had occurred, these workers were part of an organized industry that had, ostensibly, solved the collective action problem associated with lobbying the government. However, if workers have dispersed into several industries, it becomes much more challenging to continue to organize them in a cohesive fashion. Moreover, insofar as each worker is now part of some new, industry-level lobby, they are likely to be too small a proportion of this other special interest group for it to have an incentive to lobby to maintain compensation.

Secondly, the differing character of compensation transfers versus protectionist rents may lead to greater fractionalization amongst those lobbying for continued compensation. While protectionism is inherently a collective good, and thus can create incentives to lobby as a group, compensation is a private transfer that can be provided to one part of the group but not the other. For instance, say an industry declines, and some percentage of the exiting workers find employment and some percentage do not; might this not create divisions between the newly unemployed and the newly employed, where the unemployed might not lobby so hard for transfers to be maintained for those who have found employment? Fractures within the group would lead to weakening of the political interest group

as a whole.

It is also worth considering whether industries facing distress become more politically influential. It may sometimes appear that this is the case, as it is often distressed industries that are able to obtain the most obvious concessions;[2] however, this likely conflates greater *preferences* for protection with greater *ability* to wield power to obtain concessions. Special interest groups that are distressed by foreign competition would naturally invest more resources in lobbying for protection, as the gains of obtaining it are much higher (an industry that is not distressed is likely at a comparative advantage, and thus has less to gain from higher tariffs). However, variation on this dimension is unrelated to whether or not the group is more politically powerful - it simply affects how visible that influence is. In any event, this paper explicitly compare apples to apples by considering an industry that is already threatened by foreign competition and considering what happens if liberalization occurs. Under these circumstances, political influence is strictly declining as the industry declines with greater liberalization.

While liberalization always reduces the influence of import-competing groups, the degree that influence declines is not equal across interest groups. Some groups face steeper declines than others, for a variety of reasons including firm heterogeneity, access to alternative production technologies, political geography, and more. I do not develop a model explaining the variation in dynamic decline in this paper (though I think this would be an exciting area for future inquiry), but I do analyze some specific cases with an eye to how variation in this dimension can condition

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[2]Baldwin and Robert-Nicoud (2007) surveys the economics literature addressing this question, noting several empirical regularities such as higher tariff rates in recessions.

choices between protection and compensation.

# Model

## Setup

The model outlined in this paper is a political support menu-auction model similar to Grossman and Helpman's Protection for Sale, in which two industry-level special interest groups (SIGs) compete to influence an incumbent government (SIGs are principals and the government is the agent). One SIG is the main import-competing "upstream" industry (SIG 1) that benefits from protection, while the other is a "downstream" industry (SIG 2) that prefers liberalization of the good in question (e.g. steel producers as an "upstream" industry and automobile manufacturers as a "downstream" industry). Thus, they have opposite preferences over the tariff rate $\tau$, due to how it affects the price of some good.

The upstream SIG also has preferences over compensation $R$ via some other, more efficient redistributive instrument. The downstream SIG is indifferent between levels of $R$; it is assumed that compensation does not affect the price of the good (which is true for the most efficient forms of transfers), and is functionally non-competitive. While governments inevitably have to make trade-offs in deciding which groups to compensate from budgetary revenues, if there are a sufficiently large number of interest groups it seems likely that groups would not see their interests as conflictual enough that they would actively lobby against another's transfers. The two SIG setup accounts for competition between special interest groups while remaining tractable.

These SIGs attempt to influence a government that is maximizing a weighted sum of voter welfare and lobby contributions, where contributions may mean literal contributions, but may also mean expenses by a lobby in service of a particular government. "Voter welfare" simply means the aggregate economic performance of the country as a whole. For simplicity, I assume that the upstream lobby has to choose whether to pursue only protectionism or only compensation via the more efficient redistributive instrument. This also focuses attention on the main comparison of interest to this paper.

Importantly, I assume that the dynamics described earlier lead to a reduction in political influence for the import-competing industry, but I do not explicitly model the source of these dynamics. This is by design: given that there are multiple mechanisms by which influence decreases with increased liberalization, and all the effects are in the same direction, I believe the assumption that there is a reduction in political influence is easier to justify than any particular formulation. I do, however, include a parameter in the model for the degree of dynamic decline, as this varies across interest groups - some face steeper declines with liberalization than others - in ways that matter for the equilibria generated by the model.

The game proceeds as follows:

1. Game begins in a state of protectionism, i.e. $S_t = P$.

2. SIG 1 chooses whether to pursue protection or compensation, i.e. chooses $T \in \{0, 1\}$, where $T = 0$ means compensation has been chosen, while $T = 1$ means protection has been chosen.

3. If $T = 0$, the tariff rate defaults to zero ($\tau = 0$), so SIG 2 obtains their preferred outcome without lobbying. SIG 1 then chooses what contributions to "bid" to the government in exchange for compensation $R$. If $T = 1$, both SIG 1 and SIG 2 set contribution schedules to try to influence the government.

4. Government chooses $R \in [0, \infty)$ or $\tau \in [0, \infty)$ depending on $T$ and obtains the contributions defined by the schedules.

5. Period payoffs realized. If $T = 1$, the state of the world remains protectionist, and the game repeats from stage 1. If $T = 0$, the game transitions to a state of free trade ($S_t = F$), such that the import-competing interest group (SIG 1) experiences a decline in political influence. This is an absorbing state: there is no way to exit the free trade state once it is reached.[3]

$S_t = \{P, F\}$ is the state space at time $t$, $R$ can take on any positive real number, and $\tau$ is bounded by zero below, so we rule out import subsidies. $C_1$ and $C_2$ represent the amount of contributions made by SIG 1 and SIG 2 respectively. The reduction in political influence is parameterized by a movement from $\psi_P$ to $\psi_F$, with $\psi_F > \psi_P$; this parameter is a positive real number ($\psi_s \in \mathbb{R}^+$) that captures how costly making lobbying contributions is for SIG 1 (or equivalently, the efficiency of their contributions). This conceptualization fits naturally with how trade dynamics were described earlier in the paper: insofar as liberalization reduces industry profits and disrupts the organization and cohesiveness of interest groups, one would expect it to become more "costly" to make the same level of contribution as prior to liberalization. As a concrete example: having lower profits implies that contributions or other expenses will need to come via other sources, which may

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[3]This is a simplification. The substantively important aspect of this assumption is that there is *some degree* of influence that is lost once trade is liberalized that cannot be regained.

mean borrowing, diverting from research spending, etc. - these other means may impose higher costs than redirecting profits.

This setup leads to the following objective functions for any single period of the game.

- SIG 1: $u_1(\tau, R, T, S_t) = T\pi_1(\tau) + (1 - T)(R + \pi_1(0)) - \psi_s C_1(\tau, R)$

- SIG 2: $u_2(\tau) = X + \beta\pi_2(\tau) - C_2(\tau)$

- Government: $G = C_1(\tau, R) + C_2(\tau) + \alpha W(\tau, R, \epsilon, \rho)$

Where $\beta \in [0, \infty)$ parameterizes the degree of lobby competition from a downstream industry. If $\beta = 0$, there is no competition, and SIG 2 obtains income exogeneous to the model, $X$. If $\beta > 0$, SIG 2 is made worse off by increases in $\tau$, i.e. $\frac{\partial \pi_2}{\partial \tau} < 0$. Meanwhile, SIG 1 always benefits from increases in $\tau$, regardless of $\beta$, i.e. $\frac{\partial \pi_1}{\partial \tau} > 0$. This follows straightforwardly from the fact that one is upstream and the other is downstream; SIG 1 gains from having their good protected, but SIG 2 loses from facing higher prices of some input in their production process. Furthermore, both $\pi_1$ and $\pi_2$ are concave functions, i.e. $\frac{\partial^2 \pi_1}{\partial \tau^2} < 0$, $\frac{\partial^2 \pi_2}{\partial \tau^2} < 0$. This is a natural assumption: early increases in $\tau$ provide a significant competitive advantage, while at some point, later increases in $\tau$ will have shut out all foreign competition leading to prices determined by domestic market conditions.

Voter welfare $W$ is decreasing in both $R$ and $\tau$, and is concave in each.[4] $\alpha$ is the

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[4]Note that this rules out "optimal tariffs", which exist when a large country with sufficient market share can gain in aggregate by imposing a (usually small) tariff in a way that improves their terms of trade (though this reduces *global* efficiency). I am skeptical that optimal tariffs are a significant factor driving trade protection, given that it is only a limited number of countries that can make use of them, determining the optimal tariff rate can be challenging, and responses by other governments to unilateral tariff increases can undermine any potential benefits. For these reasons, the political economy of trade literature tends to assume protection is welfare-decreasing. Bagwell and Staiger 2004 is an exception: they provide a thorough account of how terms-of-trade externalities might be resolved through reciprocal trade agreements.

weighting placed on voter welfare by the government. Import demand elasticity $\epsilon$ has a conditioning effect on the rate that $W$ decreases with $\tau$, i.e. $\frac{\partial^2 W}{\partial \tau \partial \epsilon} < 0$. This follows straightforwardly from economic theory: if an industry faces a high import demand elasticity, then small changes in the price of a good have greater effects on consumption decisions, and thus tariffs will generate much larger deadweight losses for the economy imposing a tariff. In contrast, a perfectly inelastic industry will produce no deadweight losses from tariff-based changes to the price, as this will not distort consumption decisions, and will simply result in a transfer in income from consumers to the government (the exporting industry increases the price by the amount of the tariff, but since the same amount is imported, the burden falls entirely on the importers while the government collects the tax revenue). Note as well that $W$ is strictly decreasing in $\tau$, which implies that $\frac{\partial W}{\partial \epsilon}(\tau) < 0$ at any $\tau > 0$, and $\frac{\partial W}{\partial \epsilon}(\tau) = 0$ at $\tau = 0$.

Fiscal capacity $\rho$ has a similar (but opposite) conditioning effect on the rate that $W$ decreases with $R$, i.e. $\frac{\partial^2 W}{\partial R \partial \rho} > 0$, $\frac{\partial W}{\partial \rho} > 0$ at any $R > 0$ and $\frac{\partial W}{\partial \rho} = 0$ at $R = 0$. Here, fiscal capacity is conceived of as the degree of efficiency of the alternative instrument. Countries with higher fiscal capacity have better non-tariff instruments for redistributing income; they may, for instance, have tax credits, trade adjustment assistance, etc. that can be used to redistribute income at relatively low cost. In contrast, low fiscal capacity countries may have fewer means of generating revenues besides tariffs, such that any compensation ends up being highly distortionary as well. The model allows for variation in this dimension, but makes the following assumption:

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However, insofar as such agreements succeed in resolving terms-of-trade issues, protection is once again strictly welfare decreasing.

**Assumption 1.** *For any tariff rate $\tau'$, with $R' = \pi_1(\tau') - \pi_1(0)$, it is the case that*

$$W(0, 0, \epsilon, \rho) - W(\tau', 0, \epsilon, \rho) > W(0, 0, \epsilon, \rho) - W(0, R', \epsilon, \rho), \text{ for all } \epsilon \text{ and } \rho$$

This is the foundational assumption that compensation is a more efficient way of redistributing income than tariffs, though the degree of difference between the two instruments is conditioned by $\epsilon$ and $\rho$. This assumption is not usually very controversial, as given a nearly infinite set of possible things to tax in order to redistribute income, it seems unlikely that trade tariffs or non-tariff barriers are the most efficient option. However, there is also work in the trade literature that addresses this question in detail (see, for instance, Dixit 1985). If this assumption did not hold, as might plausibly be argued for the case of less-developed countries with limited fiscal capacity, then the equilibrium outcome of the model is immediately clear: tariffs would always be chosen, as they are then the most efficient means of redistributing income *and* the means that best retains the political influence of the groups that receive it. This paper is not primarily interested in these cases, which I suspect make up (at most) a very small percentage of the total.

## Analysis

We can now move on to an equilibrium analysis of the model. We start by examining what will happen if SIG 1 chooses to pursue protection. In equilibrium, given that SIG 1 is the first mover, they are effectively able to choose the $\tau$ that will eventually be implemented by taking into account in advance what SIG 2 and the Government will do in response. Thus we need to characterize their optimal $\tau$.

In this case, given the sequencing of the game and full information, SIG 1 offers to contribute an amount in exchange for their chosen tariff rate that exactly

compensates the government for both the weighted costs to voter welfare, and the foregone contributions from SIG 2. SIG 2 offers a schedule in which contributions exactly equal the benefit they would derive from lowering the tariff; in other words, their contribution schedule is "truthful", in the sense described by Bernheim and Whinston (1986).[5] Some non-truthful contribution schedules are possible in equilibrium, but only if they produce the same result as the truthful schedule, and truthful strategies are weakly dominant - thus I restrict attention to truthful schedules.[6] Government's only sequentially rational strategy is to choose the tariff rate that maximizes their weighted sum of contributions and voter welfare, which in equilibrium means they accept SIG 1's offer and implement the tariff level requested.

To see the intuition of this, note that SIG 2 is aware of Government's objective function and thus chooses a contribution schedule with full information about what tariff rate will be implemented in response to it, having already observed SIG 1's schedule. SIG 1 has no incentive to offer higher contributions than in the strategy profile outlined above, as they are obtaining their chosen tariff rate. If they, instead, offer a lower contribution, they will not achieve their chosen tariff outcome, as SIG 2 will exploit the gap by offering a contribution level that makes Government prefer implementing a lower tariff than what SIG 1 chose. Thus, SIG 1 chooses $\tau$ to maximize their objective function, taking into account that they will need to pay for SIG 2's foregone contributions and the cost of the welfare distortion

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[5]Note: since the level of $\tau$ does not impact state variables, each actor considers only the current period when determining contribution schedules.

[6]For instance, SIG 2 could provide a schedule that includes lower or higher than truthful contributions for some tariff that is not chosen in equilibrium, so long as this is not enough to induce either Government to choose it or SIG 1 to change their strategy in anticipation of this schedule. Either of these changes would break the equilibrium, as SIG 2 would then want to divert to a truthful schedule (in the case of induced changes by SIG 1, this means the schedule would not be commitment credible for SIG 2).

to the Government.[7]

Thus we have:

$$u_1(\tau, S_t | T = 1, R = 0)$$

$$= \pi_1(\tau) - \psi_s((\alpha W(0,0,\epsilon,\rho) - \alpha W(\tau,0,\epsilon,\rho)) + (X + \beta\pi_2(0) - (X + \beta\pi_2(\tau))))$$

$$= \pi_1(\tau) + \psi_s(\alpha W(\tau,0,\epsilon,\rho) + \beta\pi_2(\tau) - \alpha W(0,0,\epsilon,\rho) - \beta\pi_2(0))$$

The above gives SIG 1's objective function, where they take into account SIG 2 and the Government's best responses. Taking the derivative with respect to $\tau$ and setting to zero returns the following first order condition.

$$\frac{\partial u_1(\tau, S_t | T = 1, R = 0)}{\partial \tau} = \frac{\partial \pi_1}{\partial \tau} + \psi_s\left(\alpha \frac{\partial W}{\partial \tau} + \beta \frac{\partial \pi_2}{\partial \tau}\right) = 0$$

This implicitly characterizes an optimal $\tau^*$, when $\tau^*$ is at an interior solution. A corner solution of $\tau^* = 0$ is obtained when the above partial derivative is negative at $\tau = 0$, given strict concavity and monotonicity assumptions, i.e. when:

$$\frac{\partial u_1(\tau, S_t | T = 1, R = 0)}{\partial \tau}(\tau = 0) = \frac{\partial \pi_1}{\partial \tau}(\tau = 0) + \psi_s\left(\alpha \frac{\partial W}{\partial \tau}(\tau = 0) + \beta \frac{\partial \pi_2}{\partial \tau}(\tau = 0)\right) < 0$$

We can now derive the comparative statics to determine how $\tau^*$ changes with $\epsilon$ and $\beta$ using the implicit function theorem. This leads to the following proposition.

**Proposition 2.** *The tariff rate chosen by SIG 1 ($\tau^*$) is weakly decreasing in $\beta$ and $\epsilon$, i.e. $\frac{\partial \tau^*}{\partial \beta} \leq 0$ and $\frac{\partial \tau^*}{\partial \epsilon} \leq 0$, and is strictly decreasing when $\tau^*$ is at an interior solution.*

The proof of this is in the appendix. These comparative statics should be familiar to those who have read Grossman and Helpman (1994). They provide a good

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[7]Technically, this describes an infinite set of subgame perfect strategies, but all of these strategies share a set of properties that makes them indistinguishable in terms of how they effect the outcome. For instance, SIG 1 could easily choose a contribution schedule that offers zero contributions for anything but their preferred tariff rate; given that their preferred tariff rate will be chosen in equilibrium, this does not effect the outcome.

baseline for thinking about the moving parts in this paper, before dynamics are introduced. The intuition is that increases in $\epsilon$ and $\beta$ both increase the costs to government from a tariff that SIG 1 has to compensate them for, either by increasing the welfare costs of that tariff (with $\epsilon$) or by increasing the degree to which competing groups oppose the tariff (with $\beta$), leading to more foregone contributions from these competing groups. Substantively, a corner solution is when protection is too costly or the interest group is too politically weak for any positive tariff rate to be profitably obtained.

However, to generate insights about the choice between protectionism and compensation, what is needed is a understanding of how the indirect utility function $\gamma(\epsilon, \beta, \rho, S_t | T = 1) \equiv u_1^*(\tau^*, S_t | T = 1, R = 0)$ changes with these parameters. I derive these comparative statics as well.

**Lemma 3.** *The single-period indirect utility function $\gamma$ is weakly decreasing in $\beta$ and $\epsilon$ whenever SIG 1 pursues protection, i.e. $\frac{\partial \gamma}{\partial \beta}(T = 1) \leq 0$ and $\frac{\partial \gamma}{\partial \epsilon}(T = 1) \leq 0$, and is strictly decreasing when $\tau^*$ is at an interior solution.*

These comparative statics are fairly intuitive given Proposition 1, and are proven in the appendix. Essentially, as $\epsilon$ and $\beta$ increase, SIG 1 cannot obtain higher tariffs without expending more in contributions than those tariffs are worth to them. The overall utility from choosing protection is thus decreasing as tariffs become a less attractive means of obtaining transfers from the government. This will become important later when considering the choice between protection and compensation.

We can now examine what happens when SIG 1 chooses compensation (i.e. when

$T = 0$). In this case, SIG 2 is no longer relevant to the game, as they are indifferent between levels of compensation $R$. Outside of this, SIG 1's decision problem looks very similar to when they were determining the optimal tariff rate; they still need to compensate the Government for the welfare costs of compensation, just not for any foregone revenues from SIG 2. This produces the following:

$$u_1(R, S_t | T = 0, \tau = 0)$$

$$= R + \pi_1(0) - \psi_s((\alpha W(0, 0, \epsilon, \rho) - \alpha W(0, R, \epsilon, \rho))$$

Which leads to the following first order condition:

$$\frac{\partial u_1(R, S_t | T = 0, \tau = 0)}{\partial R} = 1 + \psi_s\left(\alpha \frac{\partial W(0, R, \epsilon, \rho)}{\partial R}\right) = 0$$

This implicitly characterizes an optimal $R^*$ when $R^*$ is an interior solution, and a $\gamma(\epsilon, \rho | T = 0) \equiv u_1^*(R^*, S_t | T = 0, \tau = 0)$. Similarly to with tariffs, a corner solution of $R^* = 0$ is obtained when:

$$\frac{\partial u_1(R, S_t | T = 0, \tau = 0)}{\partial R}(R = 0) = 1 + \psi_s\left(\alpha \frac{\partial W(0, R, \epsilon, \rho)}{\partial R}(R = 0)\right) < 0$$

I derive comparative statics in a similar fashion to when protection was chosen.

**Proposition 4.** *The optimal compensation level chosen by SIG 1 ($R^*$) is weakly increasing in fiscal capacity $\rho$, as is the single-period indirect utility for when compensation is chosen (i.e. $\gamma(T = 0)$). These are strict when $R^*$ is at an interior solution.*

Proof is in the appendix. This is intuitive in the same way as with tariffs and import demand elasticities; as fiscal capacity increases, compensation becomes a more attractive instrument, leading to higher levels of compensation, and a higher utility from choosing compensation. A corner solution of $R^* = 0$ is, substantively,

the case of uncompensated free trade.

To determine whether SIG 1 would choose compensation or protection in any single period of the game, we thus have to compare the indirect utility obtained when protection is chosen versus the indirect utility obtained when compensation is chosen. Given the assumptions of the model, we can generate the following proposition:

**Proposition 5.** *In any single period of the game, compensation is weakly preferred to protection, i.e. $\gamma(\epsilon, \rho, \beta, S_t | T = 0) \geq \gamma(\epsilon, \rho, \beta, S_t | T = 1)$, for all $\epsilon$, $\rho$, and $\beta$, and compensation is strictly preferred except when $R^* = 0$.*

The proof of this is in the appendix, but the intuition is immediately clear. Compensation is simply a less costly way of obtaining transfers from the government, both in welfare terms (it is less distortionary), and because it does not require compensating for foregone contributions from SIG 2. Since it is less costly, in any single period SIG 1 will be able to profitably obtain more of it, and their indirect utility will be correspondingly higher. This is, in effect, a statement of the puzzle around which this paper is framed: why would an interest group choose protection when compensation is less costly?

This also leads to the following useful lemma.

**Lemma 6.** *In any single period of the game, if $R^* = 0$ then $\tau^* = 0$ as well.*

Proof of this is in the appendix. The intuition is clear; since $R$ is a more efficient means of transferring income, if an interest group cannot obtain any rents via $R$, they will also be unable to obtain any via $\tau$.

It is also necessary to derive comparative statics with respect to $\psi_s$, which captures the political influence of the interest group in question. This will be important when dynamics are introduced into the model.

**Proposition 7.** *The optimal tariff rate $\tau^*$, optimal amount of compensation $R^*$, and the single-period indirect utility function $\gamma$ are weakly decreasing in political influence $\psi_s$, i.e. $\frac{\partial \tau^*}{\partial \psi_s} \leq 0$, $\frac{\partial R^*}{\partial \psi_s} \leq 0$ and $\frac{\partial \gamma}{\partial \psi_s} \leq 0$, and are strictly decreasing except in cases of corner solutions.*

Proof is in the appendix. The intuition of this is that as political influence decreases, described here as an increase in the cost of lobbying contributions/activity, the ability to obtain any kind of favorable policy decreases, reducing the indirect utility obtained from using either instrument.

With this in hand, we can now consider the dynamic setting outlined in the setup to the model. To simplify the exposition, I introduce the following notation:

1. $\chi^P(\epsilon, \beta, \psi_P) = \gamma(\epsilon, \rho, \beta, S_t = P | T = 1)$

2. $\chi^F(\epsilon, \beta, \psi_F) = \gamma(\epsilon, \rho, \beta, S_t = F | T = 1)$

3. $\phi^P(\rho, \psi_P) = \gamma(\epsilon, \rho, \beta, S_t = P | T = 0)$

4. $\phi^F(\rho, \psi_F) = \gamma(\epsilon, \rho, \beta, S_t = F | T = 0)$

In the above, $\chi^P$ and $\chi^F$ give the single period indirect utility obtained from tariffs in protectionist and free trade states respectively. $\phi^P$ and $\phi^F$ give the single period indirect utility obtained from compensation in protectionist and free trade states respectively. From Proposition 3, we know that $\phi^P > \chi^P$ and $\phi^F > \chi^F$ (except when $R^* = 0$). This leads to the following lemma:

**Lemma 8.** *In a free trade state, compensation is always chosen over protection.*

Proof is immediate. This follows from the fact that $\phi^F > \chi^F$, and the fact that $S_t = F$ is an absorbing state; there is no possibility of exiting the state, and thus no possible advantage to choosing tariffs, given that tariffs lead to a lower level of transfers than compensation.[8]

Furthermore, given that $\psi_F > \psi_P$, Proposition 4 implies that $\chi^F \leq \chi^P$ and $\phi^F \leq \phi^P$, and these inequalities will all be strict except in cases of corner solutions. Given the dynamic setup outlined earlier, we can thus consider the following pure strategy Markov (state-dependent) strategies for SIG 1, having ruled out choosing protection in free trade states in Lemma 3.

- $\sigma^1 = (T = 0$ if $S_t = P, T = 0$ if $S_t = F)$

- $\sigma^2 = (T = 1$ if $S_t = P, T = 0$ if $S_t = F)$

With $\sigma^1$, SIG 1 chooses compensation in either state of the world. Thus, after the first round, the state transitions from protectionism ($S_t = P$) to free trade ($S_t = F$). With $\sigma^2$, SIG 1 chooses protection when in a protectionist state, which maintains their political influence in future periods. SIG 1 would choose compensation if they were in a free trade state, but given $\sigma^2$, they never reach one. These two strategies produce the following value functions, which describe the discounted present value of each strategy, with discount factor $\delta$.

- $V_1(\sigma^1) = \phi^P + \delta \frac{\phi^F}{1-\delta}$

- $V_1(\sigma^2) = \frac{\chi^P}{1-\delta}$

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[8]Technically, when $R^* = 0$ and $\tau^* = 0$, an interest group will be indifferent between protection and compensation. However, in this case the instruments are identical, so for simplicity I rule out protection.

$\phi^P$ is the single period payoff obtained from pursuing compensation in a protectionist state, $\delta\frac{\phi^F}{1-\delta}$ is the value of the discounted infinite stream of compensation payoffs obtained after the state transitions to free trade, while $\frac{\chi^P}{1-\delta}$ is the value of the discounted infinite stream of protection payoffs. SIG 1 prefers to adopt strategy $\sigma^1$ whenever $V_1(\sigma^1) > V_1(\sigma^2)$, prefers $\sigma^2$ when the inequality is reversed, and is indifferent when they are exactly equal. In other words, we have:

- $\phi^P + \delta\frac{\phi^F}{1-\delta} > \frac{\chi^P}{1-\delta} \rightarrow$ Pursues compensation

- $\phi^P + \delta\frac{\phi^F}{1-\delta} < \frac{\chi^P}{1-\delta} \rightarrow$ Pursures protection

- $\phi^P + \delta\frac{\phi^F}{1-\delta} = \frac{\chi^P}{1-\delta} \rightarrow$ Pursues either.

This allows us to come to the following conclusion.

**Proposition 9.** *The unique Markov Perfect Equilibrium of the model is:*

1. *If $\phi^P + \delta\frac{\phi^F}{1-\delta} > \frac{\chi^P}{1-\delta}$, SIG 1 chooses $T = 0$ in stage 1 of the first period of the game. SIG 1 sets a contribution schedule, then obtains a compensation payoff $\phi^P$. The state then transitions to free trade, and SIG 1 obtains a payoff of $\phi^F$ for all future periods, with SIG 2 obtaining $u_2 = X + \beta\pi_2(0)$ in all periods of the game, and Government obtaining $C_1(0, R^*(S_t = P)) + \alpha W(0, R^*(S_t = P), \epsilon, \rho)$ in the first period and $C_1(0, R^*(S_t = F) + \alpha W(0, R^*(S_t = F), \epsilon, \rho)$ in all subsequent periods.*

2. *If $\phi^P + \delta\frac{\phi^F}{1-\delta} < \frac{\chi^P}{1-\delta}$, SIG 1 chooses $T = 1$ in stage 1. SIG 1 and SIG 2 set contribution schedules, the government chooses $\tau^*$, and the game repeats indefinitely. In every period of the game, SIG 1 obtains a payoff of $\chi^P$, SIG 2 gets $u_2 = X + \beta\pi_2(\tau^*)$, and Government gets $C_1(\tau^*(S_t = P), 0) + \alpha W(\tau^*(S_t = F), 0, \epsilon, \rho)$.*

3. *If $\phi^P + \delta\frac{\phi^F}{1-\delta} = \frac{\chi^P}{1-\delta}$, SIG 1 can randomize between strategies. So there may be some number of protectionist states followed by a transition to free trade and compensation*

*thereafter.*

Proof follows from preceding discussion. This is the core result of the model. Despite the fact that compensation is more efficient than protection, such that SIG 1 prefers it in any single period of the game (see Proposition 3), *they will still often choose to lobby for protection instead*, since this allows them to retain their political influence and potentially obtain higher rents (if $\phi^F < \chi^P$) in future periods. Thus, the puzzle outlined in the introduction to this paper is resolved by introducing dynamics. Interest groups cannot obtain their preferred outcome of high levels of compensation in perpetuity, because their political influence declines after compensation is chosen, reducing the incentives of Government to accommodate them; the bargaining process between SIG 1 and the Government is subject to a commitment problem.

If $\phi^F > \chi^P$, then the outcome will always be equilibrium 1; this is because even with reduced influence in future periods, SIG 1 is still obtaining a higher payoff from compensation than they would obtain from pursuing protection in any single period, even when they were more influential. This could, conceivably, be the case for industries where protection is very "expensive" for an interest group to "purchase" (e.g. if it's a highly elastic commodity for which there exist powerful downstream lobbies) and if the degree of dynamic decline is relatively small ($\psi_F$ is relatively low).

However, I expect that in most cases, $\phi^F < \chi^P$, i.e. import-competing SIGs will experience a decrease in rents extracted from the government after liberalization reduces their political influence. In some cases, you even see the total dissolution

of the interest group in question after liberalization: this would lead to a very high $\psi_F$, and a very low $\phi^F$. In this case, you may still get compensation instead of protection, so long as $\phi^P > \frac{\chi^P}{1-\delta} - \delta\frac{\phi^F}{1-\delta}$. In other words, compensation will still be chosen over protection if the single-shot benefit SIG 1 can obtain in the current period exceeds the difference between the discounted stream of tariff payoffs and the discounted stream of reduced-influence compensation payoffs.

Now recall the comparative statics identified earlier in Lemma 1 and Proposition 3, i.e. $\frac{\partial \chi^P}{\partial \epsilon} \leq 0$, $\frac{\partial \chi^P}{\partial \beta}$, $\frac{\partial \phi^P}{\partial \rho} \geq 0$, $\frac{\partial \phi^F}{\partial \rho} \geq 0$, and $\frac{\partial \phi^F}{\partial \psi_F} \leq 0$. Through the effects these parameters have on $\chi^P$, $\phi^F$, and $\phi^P$, we can determine the following:

**Proposition 10.** *Higher import demand elasticities, lobby competition, and fiscal capacity all increase the likelihood that compensation will be chosen as an alternative to protection, while a higher degree of dynamic decline increases the likelihood of protection.*

Proof follows from preceding discussion. The intuition of this proposition is that higher import demand elasticities and lobby competition increase the cost of protection, while higher fiscal capacity reduces the cost of compensation. A higher degree of dynamic decline reduces the payoffs to the interest group once free trade has been enacted, reducing their incentive to accept liberalization.

At this point, it is worth specifically considering the implications of the corner solutions of $\tau^* = 0$ and $R^* = 0$, as these are substantively interesting, albeit technically complicating. If $\tau^* = 0$ when the state of the world is protectionist ($S_t = P$), then the outcome will be free trade, as any amount of compensation will strictly dominate. If $R^* = 0$ when $S_t = P$, we have the case of *uncompensated* free trade; the interest group is not influential enough to obtain either compensation or protection
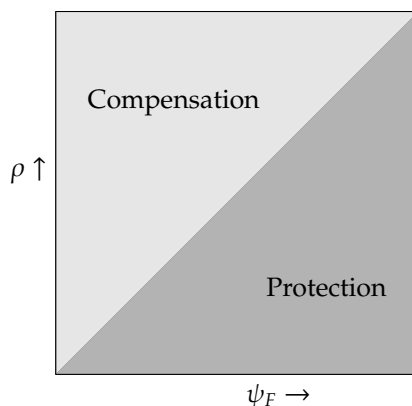
Figure 2.1: Comparative Statics for $\rho$ (fiscal capacity) and $\psi_F$ (dynamic decline).
(Holding fixed $\epsilon$, $\beta$, and $\psi_P$)

in either state of the world, so free trade is pursued as a default, leading to payoffs of $\pi_1(0)$ in all periods. Once a corner solution is obtained, further movement in the parameters of the model do not lead to any additional changes in the equilibria. However, we can assess the impact of the parameters on the likelihood that such a corner solution will be the outcome, which leads to the following proposition.

**Proposition 11.** *Increases in $\epsilon$ and $\beta$ increase the likelihood of a corner solution of $\tau^* = 0$, decreases in $\rho$ increase the likelihood of a corner solution of $R^* = 0$, and increases in $\psi_s$ increase the likelihood of both corner solutions.*

Proof is in the appendix. The most substantively interesting case described by this proposition is that of uncompensated free trade ($R^* = 0$); this paper has focused on the choice between protection and compensation, but empirically, we observe many cases of interest groups receiving neither. The model suggests this is most likely when an interest group starts the game off in a relatively weak position ($\psi_P$ is high) or when fiscal capacity ($\rho$) is low. $\psi_P$ could be high for a number of reasons; for instance, an interest group might not have successfully overcome the collective action problems associated with lobbying the government, or might not be located in a politically important geographic area.
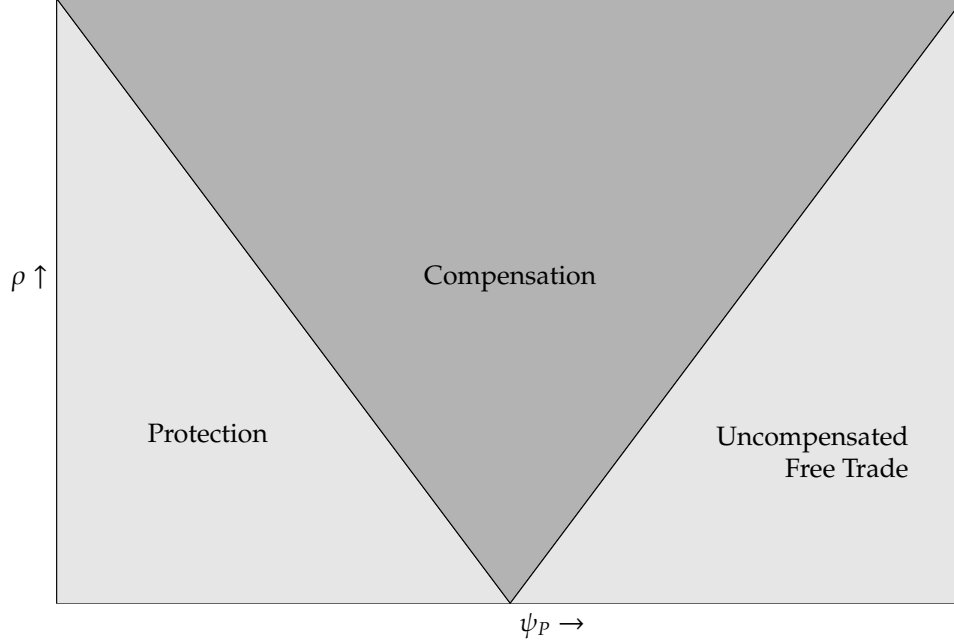
Figure 2.2: When Do We Get Uncompensated Free Trade?
The effects of $\rho$ (fiscal capacity) and $\psi_P$ (costs of lobbying in protectionist state).
(Holding fixed $\epsilon$, $\beta$, and $\psi_F$)

We can now identify the conditions under which compensation can make liberalization possible when it otherwise would not be. We have the following proposition:

**Proposition 12.** *Free trade is achieved because of the existence of compensation when both $\frac{\chi^P}{1-\delta} < \phi^P + \delta\frac{\phi^F}{1-\delta}$ and $\tau^*(S_t = P) \neq 0$. If $\tau^* = 0$ when $S_t = P$, free trade would have been the outcome anyway, with or without compensation. When, $\frac{\chi^P}{1-\delta} > \phi^P + \delta\frac{\phi^F}{1-\delta}$, compensation has no effect on the outcome, as it is not chosen.*

Proof is immediate. This follows because SIG 1 always has the option of not pursuing a tariff and achieving a payoff of $\pi_1(0)$ (i.e. if $\tau^* = 0$), in which case they accept free trade rather than engaging in any lobbying activity. If, however, $\tau^* \neq 0$ when $S_t = P$, then lobbying and obtaining a tariff is profitable for SIG 1, and they will do so if that is the only option available to them. However, so long as that payoff
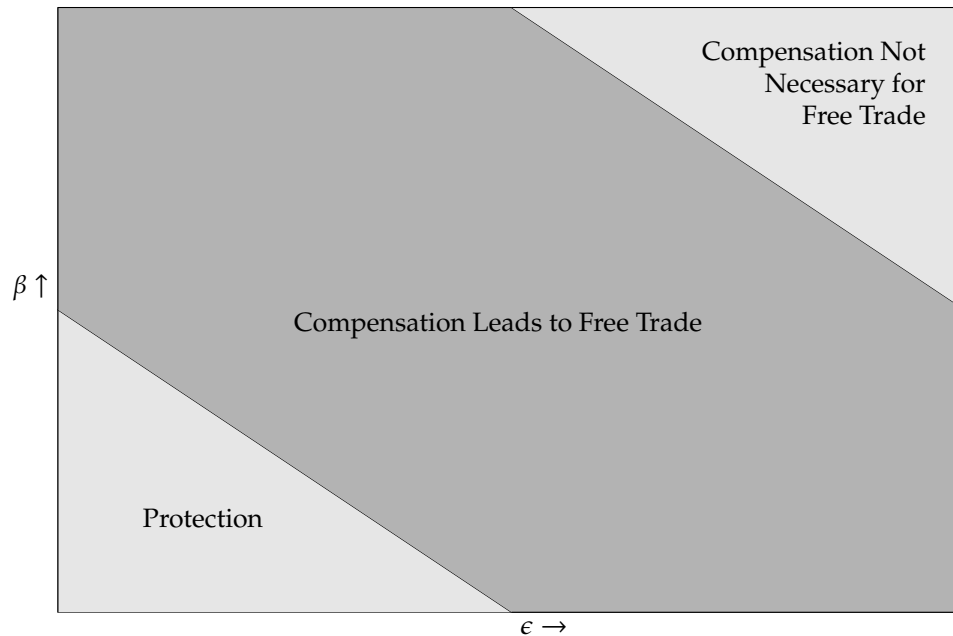
Figure 2.3: When Does Compensation Lead to Free Trade?
The effects of $\beta$ (lobby competition) and $\epsilon$ (import demand elasticity).
(Holding fixed $\rho$, $\psi_P$, and $\psi_F$)

is less than what they get from compensation, they will deviate to compensation instead.

This provides some useful theoretical foundations for thinking about when compensation can be a useful part of a bargain obtaining free trade, instead of something that interest groups will use when it's available but which does not change the outcome. The embedded liberalism literature suggests that government compensation is an important part of the political story of liberalization: this model gives conditions under which this is true, namely that fiscal capacity is sufficiently high to make compensation an attractive option, and import demand elasticities and lobby competition are high enough to keep protection from being more attractive than compensation, but low enough that free trade would not be chosen without compensation (See Figure 3).

## Robustness

How robust are the conclusions of the model to changes in the assumptions about the structure of the game? In this section, I consider and respond to several possible concerns.

**Sequencing**

To start, one might wonder whether or not the sequencing of the game within any period matters for the outcome. I assume that SIG 1 sets their contribution schedule first and thus gets a first-mover advantage to essentially determine the eventual tariff rate that is implemented (subject to needing to pay for the additional costs to Government). There are two reasons to believe this assumption is unobjectionable. First, this sequencing seems to approximate what trade politics often looks like: industry groups that oppose tariff increases rarely begin lobbying before the protectionist interest group begins advocating for a tariff, and instead seem to behave in a more reactive fashion. In the case of the steel industry, for instance, steel interest groups have often initiated lobbying for a tariff, with automobile manufacturers responding afterwards with their own lobbying activity against it. It is thus reasonable to assume protectionist groups may be able to structure their initial demands in order to obtain some advantage.

However, a much more important response is that while the sequencing is very important for the distribution of the surplus from the bargaining process, it should have minimal effect on the policy outcomes generated by this process. Note that if the model produces a positive $\tau^*$ when protection is chosen, it implies that there is some surplus to the bargaining process generated by a tariff; the Government

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is eventually paid for both their weight on the welfare costs of the tariff and the costs of the tariff to SIG 2.[9] If SIG 2 valued a zero tariff more than SIG 1 values the higher tariff, they could pay the government the difference and have a zero tariff implemented; a $\tau^* > 0$ thus implies that this is not the case. This also implies that $\tau^*$ is the value of $\tau$ that maximizes this surplus, as SIG 1 is taking both SIG 2 and the Government's marginal costs into account.

The main consequence of SIG 1 going first is that they are able to structure their initial offer in a way that they extract the entirety of the surplus available to the two interest groups; for instance, in a protectionist state, the value of the total surplus is $\Omega = \chi^P$, and is obtained by SIG 1. Now, instead of analyzing a specific alternative model, let's consider a larger class of bargaining models that assign bargaining power $\theta \in [0, 1]$ to SIG 1, and $1 - \theta$ to SIG 2, such that SIG 1 obtains $\theta\Omega$ and SIG 2 obtains $(1 - \theta)\Omega$. This allows us to generate the following proposition:

**Proposition 13.** *Any bargaining model that assigns strictly positive bargaining power to SIG 1 (i.e. $\theta > 0$) produces the same results as the baseline model.*

Proof is in the appendix. The main exception to note here is that if SIG 1 has *no* bargaining power at all, then the results could change, because SIG 1 becomes indifferent between all outcomes of the game in all periods. However, as long as they receive some positive fixed fraction of the surplus in every period, it does not change the trade-offs they face between different policy options.

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[9]This might seem slightly odd, since tariffs are value-destroying, but this occurs because many of those who experience the costs of tariffs (e.g. consumers) only enter into the bargaining process via the welfare component of the government's utility function, which has the effect of downweighting them relative to the interest groups in the game.

**The Lobbying Process**

One might also question the assumptions the model makes about the lobbying process. This paper adopts an exchange model approach to the lobbying process, in which contributions are traded for policies, but there are broadly two other categories of lobbying models that are discussed in the literature: (1) signaling models (e.g. Austen-Smith and Wright 1992, 1994); (2) legislative subsidy models (Hall and Deardorff 2006).

Signaling models posit that SIGs have private information about several factors that are relevant to legislators, such as the levels of constituency support for a particular policy, but these SIGs have incentives to misrepresent this private information in order to try to convince the legislator to adopt the SIG's preferred policy. Thus, costly lobbying becomes a way of signaling credibly this payoff-relevant information to the government.

However, this approach to understanding lobbying provides fewer clues as to which groups are likely to be able to obtain protection. In many cases with trade, the relevant information is widely known: it is clear which interest groups benefit and lose from protection, and that it harms consumers. There is some new work in trade politics that uses signaling models to better understand how firms can persuade the government to pursue their legal cases via international trade institutions (see Brutger 2017), but this work complements, rather than substitutes for traditional approaches to understanding lobbying which likely explain a more substantial part of the variation.

Legislative subsidy models argue that rather than trying to change the effective preferences of legislators, either by offering lobbying contributions in exchange for policy or by providing legislators with payoff-relevant information, lobbying is often designed to relax the budget constraint of legislators who have similar interests. Thus, legislators act "as if" they are working on behalf of the lobby group's preferences, when in actuality they are just more effectively pursuing their own interests.

While this approach also has some weaknesses when applied to trade politics, it is also unclear that the policy implications would be very different from those of exchange models. As the authors note, with a diverse set of legislators to choose between, legislators that favor policies that are also favored by powerful SIGs will obtain the greatest subsidies, and will thus be the most productive in pursuing their agenda. Policy should consequently be biased towards those who can organize and make campaign contributions, pay professional lobbyists, and finance organizations that support them (Hall and Deardorff 2006 p. 14). In this sense, the predictions about the factors that underlie interest group influence are essentially the same, suggesting few differences in the predictions generated by adopting such a model instead of an exchange model like the one employed by this paper.

## Applications of the Model

This paper was designed to accomplish two goals. First, it has sought to provide an answer to a theoretical puzzle about trade protection: why is it used over more efficient means of redistributing income? Second, it has looked to provide a the-

ory of compensation in trade politics, including when and how compensation can be a useful part of a bargain obtaining free trade. In pursuit of the second goal, the model has produced clear empirical implications that can be a useful lens for examining the cross-industry and cross-national structure of trade protection.

To start, compensation should play an important role in trade politics, but we would expect the bulk of compensation to come in the form of temporary measures that help cover the difference in costs to a special interest group between lobbying to maintain tariffs and adjusting to the costs of more open trade. Long-term measures, in which governments provide continued support to members of interest groups who lost out from open trade, should be rare due to commitment problems in the lobbying process.

In fact, most compensatory policies we observe appear to follow this pattern. Trade Adjustment Assistance (TAA) in the United States provides support to those hurt by exposure to trade in the form of job training, wage supplements, and income support, but these benefits can only be claimed for a period of about two years (Collins 2014). Similarly, active labour-market policies (ALMP) popular in several countries in Europe are a collection of temporary measures including job-training, job search assistance, and the creation of short-term public-sector jobs for the recently unemployed (Bonoli 2010, Vlandas 2013).

However, while the model predicts compensation will often be an important tool that governments can use to achieve political bargains on open trade, it also suggests that these bargains will not be possible in many cases. This should lead to

industry strongholds, where protection is retained indefinitely, despite its ineffi-ciency. We see plenty of examples of this as well: for instance, in the United States, sugar, dairy, canned tuna, and footwear are obvious cases. Footwear is discussed in depth later in this paper.

Finally, we should expect the variation in these outcomes (i.e. temporary compen-sation versus indefinite protection) across industries and countries to be explained by parameters identified by the model. The impact of these parameters is outlined in the following chart.

Table 2.1: What Makes Each Outcome More Likely?

| Protection | Compensation | Uncompensated Free Trade |
|---|---|---|
| Low $\rho$ (fiscal capacity) | High $\rho$ (fiscal capacity) | Low $\rho$ (fiscal capacity) |
| Low $\epsilon$ (elasticity) | High $\epsilon$ (elasticity) | High $\psi_P$ (low initial political power) |
| Low $\beta$ (lobby competition) | High $\beta$ (lobby competition) | |
| High $\psi_F$ (dynamic decline) | Low $\psi_F$ (dynamic decline) | |

To summarize, for a SIG that starts the game off in a position of relative influence, we should expect them to pursue and obtain protection when import demand elasticities ($\epsilon$) and lobby competition ($\beta$) are relatively low (and thus protection is less costly), or when the dynamic effects of liberalization ($\psi_F$) are anticipated to be particularly damaging to their future political influence, or when fiscal capacity ($\rho$) is sufficiently low that the alternative instruments for compensating groups are not particularly attractive options. Compensation occurs when the reverse of these things are true. If a group starts off the game in a relatively weak position ($\psi_P$ is high) it becomes likely that they will obtain little protection or compensation regardless of these other factors, as they will not be in a position to lobby profitably. This might occur for a variety of reasons, including cases where an industry has not overcome the collective actions problems associated with lobbying the

government.

## An Alternative Theory of Embedded Liberalism

This paper can help us better understand regularities identified by the embedded liberalism literature - some of which would otherwise appear to be in tension. To start, the well-documented correlation between public sector size and external openness (see Rodrik 1998) and the other empirical tests of the embedded liberalism hypothesis (see Hays et. al 2005, Margalit 2011) suggest that the compensation story has some empirical traction in trade, and this model helps to explain why we see some compensation, but not more. Moreover, this model helps to explain broader trends, such as the partial reversal of the embedded liberalism welfare state bargain in the 1980s; if the groups that were being compensated via the welfare state had become weaker over time, the incentives to maintain the size of the welfare state would naturally have dissipated.

While the embedded liberalism literature is primarily empirical, it has usually implicitly or explicitly assumed a particular theory of compensation in which governments are driven to provide compensation by concerns about income volatility generated by external openness (Rodrik 1998, Burgoon 2001, Rudra 2002). In this account of compensation, governments use income support via social welfare as a means of "insurance" against increased external risk. This has led some authors to challenge the embedded liberalism literature on the grounds that the empirical premise that openness leads to greater volatility is false (Kim 2007, Gray and Potter 2012).

This paper presents a theory of compensation that is robust to these challenges, as

it does not require external openness to lead to increased volatility. Indeed, even if trade leads to decreased volatility (as Gray and Potter (2012) argues is the case for countries at the core of the international economic system) compensation would still be important so long as trade produces winners and losers. Increased *variance* of returns (i.e. volatility) may matter if the actors in the game are risk-averse, but it is not a precondition for the core tenets of embedded liberalism to have empirical traction.

Similarly, some have argued that the embedded liberalism argument does not apply to the developing world, citing work that appears to demonstrate that greater openness is associated with less government spending on social welfare in the developing world (Rudra 2002, Wibbels and Ahlquist 2011). If one's theory of compensation is that it is a volatility-reducing insurance device, it makes sense that one would view this evidence as contrary to the story of embedded liberalism - if all states experience greater volatility with greater openness, then they should all expand their welfare states to reduce volatility, regardless of their levels of development. However, if you instead examine the situation through the lens provided by this paper, these regularities become more easily explicable.

Given that developing countries are relatively abundant in unskilled labor, we would expect greater openness to benefit the poorest (as suggested by Heckscher-Ohlin) - if the poor are the winners from open trade, then there is no need to expand the welfare state to buy their support for it. Moreover, this paper suggests that commitment problems reduce the attractiveness of compensatory policies for the losers, and that developing countries will generally have fewer alternative

means of redistributing income to compensate the losers (due to lower fiscal capacity). All of this would lead us to expect compensation to be less prominent in developing countries, and if it does occur, we would not expect it to take the form of expansions of the welfare state, which would not properly target trade's losers.

Recent empirical work accords with these predictions. Nooruddin and Rudra (2014) find that developing countries are able to compensate some of the losers of trade by increasing public sector employment, and also find these jobs generally target an elite class of workers.[10] The general picture that emerges is one in which compensation is used less frequently than in developed countries, and targets a relatively privileged class of skilled workers who are the biggest losers from open trade in developing countries.

To summarize, this paper's model provides an alternative theoretical formulation for thinking about compensation to the external risk story generally assumed in the embedded liberalism literature, in a way that can better explain what initially appear to be competing empirical regularities. In particular, this paper develops a theory of compensation that is consistent with both the evidence disputing the link between openness and volatility, and the evidence suggesting that openness has not led to increased social spending in the developing world.

## The Steel Industry

We can also examine specific cases of protection and compensation through the lens of the model. For instance, consider the steel industry in the United States. US

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[10]Rickard (2012) argues that developing countries adopt compensatory strategies which deemphasize welfare spending in favor of more targeted production subsides, but those subsidies end up performing a similar function to tariffs in propping up import-competing industries, and should thus not be treated as a compensatory alternative to protection.

Steel is a highly elastic commodity[11] with many powerful downstream interests (Blonigen 2016).

However, steel is also a case where the anticipated degree of dynamic decline of the industry has shifted over time due to the development of a new production technology: minimills. Minimills drastically increased the productivity of the steel industry, and are far more capital-intensive than traditional steel production processes.[12] Prior to the advent of minimills, the steel industry faced a very steep prospective decline if steel were liberalized, and lobbied hard (and successfully) to obtain protection via voluntary export restraints (VERs) and comprehensive quotas at several points. However, as minimills became more prominent around the late 1980s to early 1990s, this prospective decline became less severe: increased foreign competition would decrease the competitiveness of steel produced via traditional "vertically integrated" processes, but the industry could survive by shifting more of their production towards minimills (Collard-Wexler and Loecker 2015).

What was the seeming consequence of this shift in the degree of dynamic decline ($\psi_F$)? As a Voluntary Export Restraint Agreement neared expiry in 1992, steel firms gave up on lobbying for an extension (Moore 1996 p. 28). In the 25 years since, while the steel industry has sometimes lobbied for limited forms of protection, generally via anti-dumping and safeguard provisions in trade law, they have given up on ambitions of the more comprehensive protection of the 1970s and

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[11] Import demand elasticity estimates in Kee et al. (2008) provide an average elasticity of -3.32 across steel tariff categories , compared to a median of -1.39 across all tariff categories in the US. This puts steel at approximately the 78th percentile in the US.

[12] Collard-Wexler and Loecker (2015) discuss minimills development in detail.

1980s. Even their more limited demands have rarely been met for long: Bush's 2002 steel tariffs were reversed quickly under pressure from the EU, and at the time of writing this, even President Trump has stated that protecting steel is no longer a priority, after he faced pressure from retailers and automobile manufacturers who opposed such tariffs.[13]

Meanwhile, during this period, the steel industry has been one of the main recipients of trade adjustment assistance (TAA), which has often been explicitly marketed politically as a partial solution to the industry's concerns. For instance, a 2015 statement from Minnesota Governor Mark Clayton and Senators Klobuchar and Franken explicitly claimed credit for TAA approval for steel workers, suggesting it came as a result of phone calls they made to the Department of Labor (Klobuchar 2015).

Thus, this case follows the predictions of the model almost exactly. High elasticities and downstream competition made protecting steel fairly costly for the government, but when the steel industry was faced with a steep economic decline they were willing to invest the lobbying activity required to obtain it. When a shift in the degree of dynamic decline occurred in the late 1980s to early 1990s, this disrupted that equilibrium, leading to a shift towards compensation and liberalized trade in steel. However, because the degree of dynamic decline was (relatively) modest, the industry has remained somewhat politically influential, able to obtain compensation and some other small temporary concessions, but with a clearly observable reduction in their influence from several decades ago. Moreover, while it

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[13]Reuters, 14 July 2017. New York Times, 7 August 2017.

is impossible to know for certain what the outcome would have been otherwise, compensation has been treated by politicians as an important part of the political bargain that made liberalized trade in steel feasible.

## The Footwear Industry

On November 14, 2016, New Balance footwear issued a statement denying that their company had any association with white supremacists, in the wake of protests in which several of their customers set their shoes on fire and posted the videos to social media.[14] This was, to say the least, an unusual statement for a footwear company to make, and perhaps even more unusual was that it came about as a result of trade politics.

The footwear industry retains some of the highest import tariffs in the United States, at an effective rate of 9.8% - the highest of any manufactured good (USITC 2009). At the same time, it is an industry in which the vast majority of domestic consumption is satisfied via imports - a full 98%, worth 26 billion dollars each year (Rodriguez 2015)! Thus, while these import tariffs cost consumers billions of dollars each year via increased costs of footwear, the domestic footwear industry being protected is actually very small, employing only about 12,000 workers.

The most prominent company in this domestic industry is New Balance Athletics. New Balance has been extraordinarily active in lobbying government officials to maintain these tariffs, often leveraging their manufacturing facilities in Maine, which employ a few thousand workers in the state. This lobbying became especially politically contentious in April 2016, when it became clear that the final

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[14]Washington Post, 15 November 2016.

draft of the Trans-Pacific Partnership (TPP) was likely to liberalize (albeit on a delayed schedule) import tariffs on Vietnamese footwear. New Balance successfully lobbied both Maine Senators (Susan Collins and Angus King) to oppose the TPP, with Angus King explicitly linking his opposition to the TPP to New Balance, saying in a statement that "if the TPP, when finalized, does not adequately address the needs of US athletic footwear manufacturers it would be very unlikely that I would support its passage." (King 2013).

This lobbying effort became even more contentious on November 10, 2016, when the New Balance vice president of public affairs made a statement to the Wall Street Journal in which he claimed "The Obama administration turned a deaf ear to us and frankly, with President-elect Trump, we feel things are going to move in the right direction", later clarifying that this was in reference to Trump's opposition to the Trans-Pacific Partnership.[15] This was taken by white supremacists as a statement of support, leading them to champion the shoes as the "Official Shoes of White People", which eventually led to the statement by New Balance denying any association with bigotry.

Given that New Balance's statement of support for President Trump was made in the immediate wake of an exceptionally contentious election, it entailed significant costs for them in terms of public relations, with many speculating that they might have been better served by keeping quiet. However, one should consider their actions as part of a continued effort to lobby against the TPP, which Trump later withdrew from on January 23, 2017.

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[15]Wall Street Journal, 10 November 2016.

To summarize, New Balance invested an extraordinary amount to lobby the government against reducing footwear tariffs. However, what is especially odd about this is that New Balance actually produces 75% of their shoes abroad and imports them into the United States, such that the majority of their production is subject to the kinds of tariffs they lobbied so hard against.[16] It is thus unclear that they would actually lose very much financially from footwear tariff reductions. Why, then, would they lobby so actively against them?

The model of this paper can provide insight into this question. The US footwear industry is clearly characterized by low import demand elasticities, given that high tariffs have not kept foreign exporters from obtaining a 98% market share. Furthermore, while large companies like Nike (which imports all of its footwear from manufacturing facilities abroad) lobbied for the tariff reductions, these companies were able to pass off some share of the costs of the tariffs to consumers, and also had a number of other lobbying priorities, such as intellectual property and domestic taxation. Thus, the lobbying costs for New Balance of maintaining footwear tariffs were not as high as one might initially expect.

While eliminating import tariffs would not significantly hurt New Balance's profits directly, it would eliminate the competitiveness of their US manufacturing operations in Maine, such that they would have to shift production overseas. This would significantly reduce New Balance's political influence in the future, given how effectively they had leveraged these factories in their past lobbying activities.

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[16] Wall Street Journal, 30 September 2014.

Consequently, this provides a clean example where a policy change would bring about a reduction in influence without much affecting profits or other parts of the interest group's objective function.

How might New Balance use continued political influence to their gain? On November 30, 2016, Senators Collins and King announced that they had ensured that a provision would be included in the National Defense Authorization Act of 2017 that would require the US military to buy 125,000 pairs of shoes a year from New Balance (King 2016). This is as close to a pure political rent as one commonly observes in US politics, and it was obtained because New Balance retained its political influence by keeping its US manufacturing alive via tariffs on footwear.

Thus, this case illustrates several aspects of this paper's model: how low import demand elasticities ($\epsilon$) and lobby competition ($\beta$) can make trade tariffs less costly for the government to provide (even when the costs to consumers seem high), and how high prospective reductions in political influence (high $\psi_F$) can motivate interest groups to pursue protection in order to retain political influence in the future.

## Conclusion

In this paper, I have developed a dynamic model that can help to address two outstanding puzzles in the political economy of trade literature: (1) Why is trade protection often used by governments despite the fact that it is an inefficient means of redistributing income? (2) Given that both trade protection and compensation appear to be used by governments in response to the demands of interest groups,

what accounts for their heterogeneous use across states, sectors, industries, and time? With respect to the first puzzle, I have identified how the dynamic effects of liberalization on the strength of competing lobby groups can lead to instances where protectionism - though less efficient - may be preferred by lobby groups because the Pareto superior compensation transfers are subject to a commitment problem.

With respect to the second puzzle, I have identified that compensation may still be pursued depending on parameters such as import demand elasticities, the degree of downstream lobbying, the anticipated degree of dynamic decline, and fiscal capacity. In particular, when industries are highly elastic, or in cases where downstream interests are prominent, compensation becomes relatively more attractive when compared with protectionism, as the net benefits of protection when the contribution costs are factored in may be less than the compensation payoffs. This becomes especially likely when fiscal capacity is high enough to make compensation an attractive option, and the degree of decline in political influence an interest group faces is not too severe. Furthermore, I have identified the conditions under which compensation can be effective in producing liberalization where protectionism would otherwise occur. The model has thus generated a set of empirical predictions that allow for a new interpretation of the compromise of embedded liberalism, and provided a new lens for evaluating specific cases of protection and compensation.

# Screening for Losers: Trade Institutions and Information

# Introduction

In determining which industries to protect from trade competition, governments are faced with difficult tradeoffs in an environment of incomplete information. While governments would like to protect politically important groups who are threatened by trade competition, doing so imposes aggregate welfare costs that may be politically costly, and can impose significant concentrated costs on downstream industries that are also politically important (for instance, automobile manufacturers are affected by steel tariffs). As a consequence, governments are often best served by protecting only a subset of groups that are harmed by trade competition, such as those that are harmed the most severely, or those that are facing "unfair" competition from firms abroad. However, whether or not this is true for any group is often the private information of that group, and they do not have an incentive to honestly reveal that information, given that they benefit unconditionally from more protection.

Similarly, exporting firms often have a clear sense of how well the laws and regulations of other countries conform with international legal commitments, given

that these firms have an incentive to monitor such things and often experience the consequences directly. However, firms benefit unconditionally from any changes to the policy that will boost their exports' competitiveness, and thus have an incentive to misrepresent the legality of any policies that they find unfavorable when lobbying the government. Governments, however, may only want to invest political capital and financial resources in the cases which involve truly unfair practices on the part of foreign actors. Thus, a question arises: are there mechanisms by which interest groups can credibly signal these characteristics of their situation in order to allow the government to overcome the selection problem?

This paper presents a formal model in which the selection of the forum and/or instrument through which an interest group pursues government support can perform this function. Trade institutions often provide many options for supporting domestic industries, from several kinds of "trade remedies", which allow for temporary protection of industries that are suffering injury as a result of trade competition (see, for instance, safeguard measures under Article XIX of the GATT or antidumping actions under Article VI), to procedures for challenging the illegal practices of other countries. However, these institutions will often independently assess the validity of such claims when faced with a dispute (e.g. Dispute Settlement proceedings in the WTO). As such, given that institutions and instruments differ in their standards for granting or challenging claims, an interest group's selection of one over another can credibly reveal information about the group's type.

This is possible because with a high enough probability of a claim being rejected or overturned, the expected value of pursuing that claim for an interest group or

firm can be lower than the fixed costs they would need to pay for lobbying and legal costs. Thus, institutions can structure the choice environment such that it is only incentive compatible for the firms with the strongest cases to pursue certain forms of government action.

Consequently, this paper's model can improve our understanding of the use of trade institutions by states in a number of ways. First, it can help to explain why states and firms choose particular institutions or legal mechanisms over others when pursuing actions that could feasibly fall under several umbrellas. Second, it can help to explain the particularities of how institutions and trade remedies are structured - including why we observe a system in which states must meet specific criteria to invoke flexibility privileges, instead of a system of "compensation" to aggrieved parties. Third, it provides a new, domestic-based explanation for how international institutions can be useful to governments; namely, that they can use the threat of international arbitration to sort through a situation otherwise marred by information asymmetries to better select which legal cases to pursue, and which actors to support with protection.

## Overview of the Literature

Given the importance of trade institutions - especially the WTO - in the international legal landscape, political scientists, economists, and legal scholars have devoted significant attention to unpacking the use of dispute settlement and trade remedies by governments. An important strand of this literature is the subset that addresses forum-shopping in international trade (Busch 2007, Davis 2009). Broadly, this work argues that when states are filing a dispute, they will select the

forum that gives them the highest probability of success, except in such cases where the informal precedent set by a ruling may bind on other subsets of countries. If the precedent set by a case is likely to be featured in future disputes, a country selecting an institution may trade off the likelihood of success in a particular case against how important the precedent is likely to be in future disputes with third parties, if that precedent is expected to count against them in those future disputes (Busch 2007). This provides an explanation for why states might not always choose the institution that gives them the highest likelihood of success: namely, that they may also consider whether they want to set a regional or global precedent.

This conclusion relies on two important assumptions: (1) that legal precedent exists in international trade law; (2) that the precedent set is *institutionally specific*, e.g. a ruling at the WTO would not, in turn, impact future rulings at NAFTA courts, or vice versa. In assessing these assumptions, it is worth noting that true, legally-binding precedent does not exist in international trade law[1], so while courts may rely on previous rulings when developing their reasoning, they are not bound by *stare decisis*. Indeed, especially in the case of WTO rulings on "zeroing" - a practice employed by the US in the assessing of antidumping duties - the US position has been that previous Appellate Body rulings should have no impact on future rulings.[2]

In practice, WTO panels have usually argued that "ensuring 'security and predictability' in the dispute settlement system, as contemplated in Article 3.2 of the DSU, implies that, absent cogent reasons, an adjudicatory body will resolve

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[1]See, for instance, Article 3.2 of the WTO DSU
[2]See Panel Report, US-Zeroing (Korea)

the same legal question in the same way in a subsequent case."[3]  Furthermore, empirical evidence from political scientists has generally been supportive of the impact of informal precedent (Kucik and Pelc 2014, Pelc 2014).  However, a regime organized around "de facto" rather than "de jure" precedent is less likely to be institutionally specific.  Indeed, as a NAFTA ruling on zeroing explicitly stated: "Several WTO decisions have now held that the use of zeroing is inconsistent with US obligations under the WTO Agreement. While not binding on American courts, these decisions serve as authoritative interpretations available to clarify the obligations of members under the Agreement. As such, they serve as useful tools in fashioning interpretations of domestic statutes which would not contravene the international obligations."[4]

Without drawing any definitive conclusions on this open area of inquiry, this paper provides a different explanation for why states, directed by interest groups, might select institutions that give them a lower likelihood of success *holding fixed the weighting placed on third parties*.  In particular, interest groups might request pursuit of a dispute at a "difficult" institution as a way of signaling credibly the strength of their legal case.  This explanation is thus consistent with the possibility that legal precedent is not institutionally specific.

Other important research on institutions discusses the inclusion of flexibility provisions in international trade agreements.  This work suggests that flexibility provisions are a means of making trade agreements more "stable", by allowing parties to the agreement a "safety valve" in cases of heightened domestic political

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[3]Appellate Body Report, US-Final Anti-dumping Measures on Stainless Steel from Mexico, WT/DS344/AB/R, 30 Apr. 2008, para. 160.
[4]Binational Panel Report, SSSS from Mexico, p. 11.

pressure for protection. (Rosendorff and Milner 2001, Koremenos 2001, Rosendorff 2005) These arguments outline an "efficient breach" story, whereby states are required to pay some cost when making use of flexibility measures in order to ensure such measures are only used in circumstances where the benefits of temporarily leaving the agreement exceed the costs to other parties. (Rosendorff and Milner 2001, p. 831)

However, this literature does not provide a clear sense of why an institution would include multiple trade remedies; indeed, Rosendorff (2005) simply states that the different means "have the same effect of allowing temporary relief when the local industry comes under pressure from foreign competitors" (Rosendorff 2005 p.396). In contrast, this paper suggests that having different instruments for temporary protection with differing probabilities of being overturned and differing benefits allows governments to match higher levels of protection to those with the strongest cases.

Moreover, the efficient breach story of this literature is not especially consistent with the way that flexibility provisions are actually administered. As Pelc notes, "compensation following escape was only widespread in the 1950s." (Pelc 2011, p.349) Instead, trade remedies have come to be governed by "appeals to exception", in which states need to justify their temporary departure from prior legal commitments by arguing that they meet certain criteria, such as "severe injury" in the face of "unforeseen circumstances" (Pelc 2011, p.350). Pelc also posits an informational explanation for this shift in governance, arguing that "members have a strategic incentive to portray any instance where they face some domestic pressure

for protection as constituting true exigency arising from severe and unforeseeable circumstances", suggesting that a criteria-based system with monitoring and enforcement can provide incentives for states to honestly reveal information (Pelc 2011, p.355).

This paper's argument is in the same spirit, but differs in a number of important respects: (1) it suggests that private firms and interest groups, not states, are the actors that possess this private information about the degree to which criteria are met; (2) it argues that governments may also want to constrain their use of escape clauses to instances that meet the outlined criteria, but might struggle to do so because of the information asymmetries that exist with these domestic actors. Thus the model discusses *intra*state information revelation, instead of the *inter*state information revelation discussed by Pelc.

This paper also speaks to a relatively nascent literature on informational lobbying with respect to trade liberalization. This literature outlines how firms can use costly lobbying to signal the strength and value of potential cases (Brutger 2017, Betz 2018). Like Brutger (2017), I note that firms have private information about the strength of their cases that can be difficult to reveal credibly, but I posit a different mechanism by which groups can overcome this credibility problem. I believe that the mechanism I posit is complementary to Brutger's, and is consistent with the same evidence on the high success rates of WTO complainants.

Lastly, this paper speaks to a broader literature on how international institutions and international law can be helpful to national governments (Keohane 1984, Ko-

remenos et. al 2001, Koremenos 2001, Kucik and Pelc 2016, Pelc 2016). Amongst other things, this literature has discussed the role that institutions can play in "tying the hands" of governments to policies that might be resisted by domestic groups, and has identified "information" as a potential benefit of such institutions. However, these discussions of information and institutions have focused almost exclusively on how institutions can help to provide information about other states by, for instance, monitoring compliance.

This paper posits a new reason why international institutions can be helpful; namely, that they allow governments to obtain private information about interest groups so as to better allocate protection and other forms of political support. Like the "tying hands" argument, this suggests that governments may use agreements with foreign countries as much to address their internal politics as their external relations. Unlike these previous arguments, this paper focuses on how institutions can be leveraged to make information transfer from domestic groups more credible, rather than used as a device to make the government's commitments to unpopular policies more credible.

# Reviewing the Trade Law

## The Institutional Landscape

Founded in 1947 as a provisional agreement between 23 countries, the General Agreement on Tariffs and Trade, or GATT, was initially conceived of as a temporary precursor to a forthcoming International Trade Organization (ITO) that was expected to form the institutional basis for world trade (Trebilcock 2011). However, due to strong opposition from the US Congress, the ITO never materialized,

and the GATT became the main institutional/legal foundation for world trade by default. Over the course of the eight completed rounds of negotiation since, membership in the GATT expanded to more than 150 countries, and tariff rates in member states fell dramatically. This culminated with the Uruguay Round of negotiations, which ended in 1993, and at long last established a formal World Trade Organization (WTO), which included a formal apparatus for settling disputes (the Dispute Settlement Body, which is governed by the Dispute Settlement Understanding, or DSU) instead of the ad-hoc panels that had been used prior to that point (Trebilcock and Howse 2005).

Many initially hoped that the World Trade Organization would be a single forum through which trade liberalization could be negotiated on a broadly multilateral basis, avoiding the possible trade diversion inefficiencies and international resentment that could be brought on if trade liberalization was instead conducted through a series of bilateral agreements. Indeed, GATT Article XXIV attempts to limit the development of preferential trade agreements (PTAs) by insisting that they only be allowed in such cases where they eliminate all duties and other restrictions on commerce on "substantially all trade". However, especially in recent years, this hope has been dashed; from 1990-2010, the number of PTAs rose from about 70 to approximately 300 (Baccini et al. 2011).

This explosion in the number of PTAs has led to the peculiar situation where trade between countries is often governed by several overlapping institutions, such that complainants may have to choose between forums through which to lodge a complaint. Moreover, these forums can differ significantly in the way

they resolve disputes; for instance, while both the North American Free Trade Agreement (NAFTA) and the WTO have dispute resolution proceedings (NAFTA Chapter 19 & 20 and the DSU respectively), the former tends to draw panels of those with domestic judicial expertise (this was developed under pressure from the US Congress to ensure that panelists would have an in-depth familiarity with US Administrative law), while the latter is weighted more towards those with expertise in international trade law and economics (Howse 1998). This can lead to differences in how similar cases would be adjudicated, given that trade law cases often rest on technical determinations of "material injury" and "dumping" that are necessarily made by economists and statisticians. For instance, in the somewhat unusual case of the US-Canada Softwood Lumber dispute, where aspects of the dispute were brought to both the WTO and NAFTA, a WTO panel ruled that a threat of material injury to US industries was present, while a NAFTA panel ruled precisely the opposite (Pauwelyn 2006).

If forums differ in how they adjudicate disputes, and if states have a choice about which forum to use when pursuing a claim, then "forum-shopping" becomes inevitable, whereby states and firms choose between different forums strategically. Furthermore, the issue of overlapping institutions is likely to continue to increase, given that the rapidly rising number of PTAs increases the likelihood that any given dispute will be governed by more than one institution. Marc Busch (2007) identifies several reasons why a state might prefer one forum over another, including timeliness of dispute resolution, available remedies, etc. and ultimately argues (as discussed earlier) that countries choose the forum that gives them the best probability of success *ceteris paribus*, but that they may also trade this off

against the value they place on trade with third parties in the institution who may be affected by the setting of any informal precedent (Busch 2007).

For most of these dispute resolution forums, country-level governments are the only actors with standing to pursue disputes. This sets up the informational problem that is this paper's primary subject of inquiry, as states seek to determine which disputes to pursue, but private firms and interest groups possess the private information required to best make those decisions. However, there are exceptions: for instance, investor-state dispute settlement (ISDS) procedures, such as NAFTA's Chapter 11, allow investors to sue governments directly when they believe that states have violated their investment obligations, and NAFTA's Chapter 19 gives firms private standing to request a binational panel to review antidumping and countervailing measures. This paper's model provides insight into when certain institutional forums and mechanisms will be chosen over others, and into the impact of removing the "gatekeeper" role of government in dispute resolution, as occurs with ISDS and Chapter 19.

## Flexibility Provisions

In addition to providing means for governments to claim violations of an agreement, trade agreements generally allow states to temporarily suspend certain obligations under specific circumstances. These have been referred to by Koremenos et al. as "flexibility provisions"; i.e. those provisions that allow members to "escape" temporarily from obligations under the agreement, usually in response to some unanticipated shock (Koremenos et al. 2001). "Safeguard measures", as they are often called, exist under both NAFTA and the WTO; NAFTA has measures under Chapter 8, and the WTO has measures under GATT Article XIX (Trebilcock

and Howse 2005). Moreover, there are certain measures that have been interpreted as being de facto flexibility provisions even if they appear in principle to target unfair trade practices; for instance, it has been argued that anti-dumping (AD) laws are a form of flexibility provision (Kucik and Reinhardt 2008). Countervailing duties (CVDs) are the main other form of trade remedy, and are formally a way of responding to illegal subsidies of other countries, but they may be used instead as a flexibility provision (particularly given that states have the option to challenge illegal subsidies via the DSU).

Worth noting is that these trade remedies also differ in the degree to which they target specific countries or are applied more broadly. CVDs apply to the countries accused of implementing illegal subsidies and anti-dumping duties apply to the countries accused of dumping; both are therefore explicitly discriminatory. Safeguard measures, in contrast, are required to apply in a nondiscriminatory manner to all countries. However, Bown (2013) suggests that in many cases, appropriately targeted antidumping duties will have economic effects that are very similar to those of a broader safeguard measure.

For all forms of trade remedies, firms and interest groups representing them are likely to have private information about the strength of their case. All of these provisions usually require evidence of "injury"; an empirical claim that necessitates showing both that the firm is under economic duress, and that this duress is causally related to competition from international trade. Anti-dumping provisions also require evidence that imported goods are being sold in the complainant's country at a lower price than they are being sold in the exporter's country, or that

the goods are being sold below cost (Trebilcock and Howse 2005). Similarly, CVDs require evidence that the exporting country is subsidizing their exports.

## The Argument

Firms naturally have information about material injury and prices of competing goods as part of their regular business practices, while governments will often either not have access to it (as with internal research conducted by the firm), or will be unwilling to expend the resources required to collect it. Firms will also often have private information about the compliance of other countries with their international legal obligations, given that these firms have an incentive to invest more resources in monitoring other countries for violations, and will experience the consequences of violations directly when it affects their balance sheet. Indeed, Brutger (2017) conducted interviews with a number of trade officials and trade lawyers who had been involved in prominent trade disputes and found that these trade experts believed that the firms involved possessed this kind of private information (Brutger 2017 p. 20).

This claim is reinforced by the fact that the agencies tasked with administering trade law are financially constrained; for instance, the Office of United States Trade Representative (USTR), which is tasked with pursuing any claims via the DSU, has a budget of approximately $50 million, much of which is allocated towards funding trade negotiations instead of monitoring domestic firm performance (USTR Budget Report 2015). Similarly, the United States International Trade Commission (USITC), which is tasked with investigating injury in AD, CVD, and safeguards cases has an annual budget of approximately $85 million, of which approximately

$25 million is spent on the administration of trade remedies (USITC Budget Report 2016). The Commerce Department, which is responsible for making determinations of dumping or unfair subsidies, has a budget of approximately $80 million for "enforcement and compliance" of AD/CVD, and has in fact had to request an additional $8 million in the 2018 budget in order "to develop factual information and legal justification to self-initiate U.S. antidumping duty (AD) and countervailing duty (CVD) investigations", suggesting that financial constraints have limited their capacity to do this in the past (Ross 2018, p.42).

As a consequence, firms need to signal their private information to governments if governments are to be able to select between cases when choosing which disputes to pursue, or whom to grant protection via a trade remedy. However, as firms benefit unconditionally from these government actions, they always have an incentive to say that their injury is high, and that their case is otherwise strong. While firms can (and generally do) disclose documentation to support their case, there is no way to ensure that this information is not being presented in a biased fashion, with certain information being withheld or presented in a manner so as to paint the firm's case in the most positive light.

Governments likely do not want to invest reputational capital and financial resources in pursuing cases that have a high probability of failure. Moreover, governments would often prefer not to protect those firms which have not experienced material injury, given that protecting such "weakly injured" groups provides fewer political gains while imposing costs on potentially influential downstream competitors, as well as aggregate welfare costs that may be politically important. Put

differently, distributing trade protection is a "negative sum good"; giving trade protection to some groups reduces the total amount of resources that can be distributed to all parties.[5] Thus, absent credible information transfer from firms to the government, governments may choose not to protect any groups at all, or not to pursue any trade disputes.

The argument of this paper is that firms may choose to pursue support via institutions or mechanisms that give them a lower probability of success or that are more costly if this allows them to credibly signal private information about the strength of their cases. In effect, a firm may choose a "hard test" of the strength of their case if it allows governments to distinguish between that group and others that would be unwilling to select the hard test due to their even lower likelihood of "passing" it.

This works if the dispute settlement process can reveal information about a firm's type, which I argue is the case in practice for two reasons. First, if a dispute is initiated (either by a domestic firm or by a foreign firm challenging a trade remedy), the case will often reduce to technical determinations of fact by economists and statisticians, often with further factual disclosures to the panel by firms on the opposite side of the case. If this is an independent signal that is positively correlated with the strength of the case, this can reveal information about a firm's type. Second, for trade remedies, if we assume that governments will only initiate disputes in which they think they have a chance of succeeding, then dispute initiation reflects the aggregated information of both foreign states and foreign firms. Thus, weak

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[5]I thank James Morrow for this way of phrasing it.

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cases are both more likely to be challenged, and (not independently) more likely to be overturned when challenged. The combination of these two things reflects the "probability of success" when a government implements a trade remedy, in a way that is directly related to a firm's type.

Not only does this screening mechanism help with legal case selection (helping to explain the extremely high success rate of WTO complainants), but it allows governments to separate the groups that they would want to protect from those that they would not, even if a legal institution regulating trade did not exist. Thus, this paper provides another argument for why governments may want to have independent institutions that regulate and enforce trade policy; namely, because these institutions may help them obtain useful information that then allows them to better satisfy their domestic political objective function.

## Firms and Interest Groups as the Primary Actors

This paper treats firms and interest groups as the primary actors involved in pursuing trade remedies and initiating disputes, with governments playing the more passive role of simply accepting or rejecting the overtures by these private groups. It is thus worth considering the degree to which this characterization accords with the empirical evidence.

With trade remedies, there is a significant amount of evidence supporting this description of the process. In the United States, the vast majority of trade remedy cases have been initiated by workers, firms, or industry associations; 2003 out of 2022 since 1980 to be precise, or approximately 99.1%.[6] In these trade remedy

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[6]Chad Bown in The Washington Post, April 21 2018.

cases, governments either formally determine whether to pursue a case once a determination has been made by the USITC (as with safeguards), or have a significant degree of influence over the process by way of the Commerce Department ruling on dumping or illegal subsidies by foreign countries. Thus, the process looks exactly as described: firms and interest groups petition for protection via the trade remedy of their choice, and governments choose whether or not to accept their request, subject to a plausibility check of injury by the USITC.

The issue is a little more subtle when it comes to dispute settlement, given that usually states are the only actors with standing to initiate disputes. However, even in these cases, the evidence suggests that governments generally only initiate disputes in response to lobbying from domestic firms and interest groups. Ryu and Stone (2018) provide statistical evidence that this is the case, demonstrating that political contributions by affected firms increase substantially prior to the initiation of disputes. Betz (2018) also provides examples of interest group driven disputes (Betz 2018 p. 641-642) .

## Model

### Set-Up

In this model, there are two players: Government ($G$) and an interest group ($I$). The interest group is lobbying for trade protection, and has private information about their degree of injury $\theta$, with interest group types distributed $\theta \sim f(\theta)$ with support on $\Theta = [0, w]$. Assume for simplicity that $f(\theta)$ is absolutely continuous. Governments want to protect the most strongly injured groups (i.e. those with high $\theta$) but not weakly injured groups (those with low $\theta$). Thus, interest groups

always have an incentive to tell the government that they are severely injured in order to try to obtain the most protection. This can be generalized by thinking of $\theta$ as more broadly representing the strength of a group's legal case.

Now suppose that $I$ can choose between two institutional mechanisms when pursuing protection, and one of those mechanisms gives a strictly lower probability of success than another. For expository purposes, we can call the more stringent mechanism DS and the less stringent mechanism CVD; this reflects a relatively clean example of screening, wherein an interest group facing subsidies can either lobby the government to pursue a legal claim against another country via dispute settlement (DS) or file for CVDs via the USITC and Department of Commerce. However, there are many instruments and institutions that interest groups can choose from, so this is only one example of such a selection process; others will be elaborated upon later in the paper. The government then observes which request is made, and decides whether to grant it.

If protection is pursued via DS, then a panel rules in favour of $I$ with probability $\pi_D(\theta)$. If protection is pursued via CVD, then the CVD stands (i.e. is either not challenged, or is challenged and upheld) with probability $\pi_C(\theta)$. Both $\frac{\partial \pi_D}{\partial \theta} > 0$ and $\frac{\partial \pi_C}{\partial \theta} > 0$ , which captures the idea that higher types (i.e. those with stronger cases) have a higher chance of success via either legal mechanism, but we set $\pi_D(\theta) < \pi_C(\theta)$, $\forall \theta \in \Theta$ to reflect the fact that dispute settlement is the more "stringent" of the two mechanisms.[7]

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[7]Note that the existence of derivatives of the probability functions implies those functions are continuous across their domains in $\theta$. In this paper, all functions of $\theta$ will be continuous.
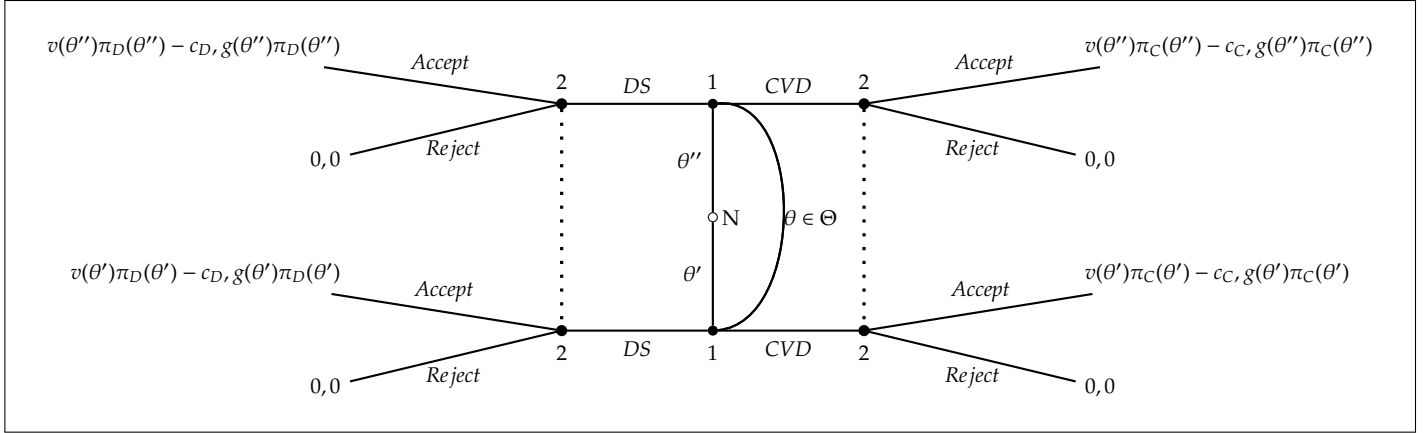
Figure 3.1: Institutional Selection Model

Government obtains $g(\theta)$ from protecting an interest group, with $\frac{\partial g}{\partial \theta} > 0$, implying that they prefer to provide protection to higher types. Note that $g(\theta)$ can be either positive or negative. Government obtains a payoff of zero from either rejecting an interest group's request, or if the panel rejects a claim or the CVD is overturned (leading to no protection).

Interest groups obtain payoffs of $v(\theta)$ if they receive protection, with $\frac{\partial v}{\partial \theta} > 0$, reflecting the fact that protection is more important to them if they are strongly injured. They experience fixed costs $c_D > 0$ if Government pursues their claim via DS and fixed costs $c_C > 0$ if Government approves their claim via CVD. So pursuing a claim is costly for the group, and may only be profitable if the chance of succeeding is sufficiently high. The model also assumes that $c_D \geq c_C$ for simplicity. Industries obtain a payoff of zero if their request is denied in any case. Thus, we have the game tree found in Figure 1.

## Pooling Equilibria

Throughout the equilibrium analysis, I assume that pursuing a claim for protection via CVD is profitable for all types (i.e. $v(\theta) - c_C > 0$, $\forall \theta \in \Theta$). A simple extension

to the model would allow a group to choose not to pursue a claim at all and receive a payoff of 0, or to pursue unilateral protection outside of any international legal institution and avoid any legal costs (unilateral protection can be treated as a degenerate case where $\pi_C(\theta) = 1$, $\forall \theta \in \Theta$ and $c_C = 0$). However, this paper is most interested in addressing the selection process between mechanisms when at least one of them is profitable to both types. One can simply keep in mind that unilateral protection or not pursuing protection is always an option, and note that this model applies to instances in which all groups can gain by having their claim pursued via at least one mechanism.

Several pooling equilibria are possible in this model. For instance, it is possible to sustain equilibria where $G$ protects all types and all groups pursue protection via CVD irrespective of type:

$$AllCVD = (\sigma_G = Accept|DS, Accept|CVD; \sigma_I = CVD|\forall \theta \in \Theta)$$

if the following condition holds:

**Condition 14.**

$$\mathbb{E}[g(\theta)|AllCVD] = \int_0^w g(\theta)\pi_C(\theta)f(\theta)d\theta \geq 0$$

Intuitively, the above condition means that the percentage of firms that are strongly injured is high enough that it is still better for Government to pursue protection even if there is no way to distinguish between firms of different types. It is also possible to have pooling where both types pursue protection via DS, if the above pooling condition holds with $\pi_D$ substituted in for $\pi_C$, if pursuing protection via DS is profitable for all types (i.e. if $v(\theta) - c_D > 0$, $\forall \theta \in \Theta$), and if Government has off-equilibrium path beliefs $q \sim p(q)$ such that:

$$\int_0^{\bar{w}} g(q)\pi_C(q)p(q)dq \leq 0$$

Intuitively, the above condition implies that upon observing a group pursuing CVD, Government believes that it is likely enough that the deviating type is weakly injured that they do not wish to protect that deviator.

We can also obtain a pooling equilibrium where each type always chooses either CVD or DS and Government never protects if you reverse Condition 1 and ensure that off the equilibrium path beliefs are such that government prefers not to protect deviators.

## Separating Equilibria

However, this paper is mostly interested in separating equilibria; i.e. those instances where interest groups' selection of various institutions can help to reveal information about their type. To find these, we proceed as follows.

In any separating equilibrium, we can establish a cutpoint $\bar{w}$ above which a group selects DS and below which they select CVD. The only pure strategy that governments can adopt that would induce separation is $\sigma_G = (Accept|DS, Reject|CVD)$, otherwise CVD weakly dominates for the interest group (given that $\pi_D(\theta) < \pi_C(\theta)$). Stated intuitively, if Government adopts any strategy other than accepting only the claims pursued via the more stringent institution, groups will never have an incentive to choose the "harder test", because Government would not be providing them any benefits over choosing the "easy test".

Assuming Government adopts this strategy, we can now consider the interest group's incentives conditional on this, denoting the group's expected utility function $U_I$. We derive the cutpoint $\bar{w}$ by determining where $U_I(DS) = U_I(CVD)$, with $U_I(CVD) = 0$ (given that their claim will simply be rejected by the government), and $U_I(DS) = v(\theta)\pi_D(\theta) - c_D$. Setting these equal to each other, we get:

$$U_I(DS) = U_I(CVD) = v(\theta)\pi_D(\theta) - c_D = 0$$

$$\leftrightarrow \pi_D(\theta)v(\theta) = c_D$$

This implicitly defines a cutpoint $\bar{w}$, if such a cutpoint exists. To ensure its existence, simply assume that $\exists \theta \in \Theta$ such that $U_I(DS) < U_I(CVD)$, and $\exists \theta \in \Theta$ such that $U_I(DS) > U_I(CVD)$. This simply implies that there are some types that are low enough that it is not incentive compatible for them to choose DS, and some high enough that it is incentive compatible; a necessary condition for the analysis of this paper to have any traction.

Given this, we can define Goverment's utility function as $U_G(Reject) = 0$ and:

$$U_G(Accept|DS) = \int_{\bar{w}}^{w} [g(\theta)\pi_D(\theta) + (1 - \pi_D(\theta))(0)]f(\theta)d\theta = \int_{\bar{w}}^{w} g(\theta)\pi_D(\theta)f(\theta)d\theta$$

$$U_G(Accept|CVD) = \int_{0}^{\bar{w}} [g(\theta)\pi_C(\theta) + (1 - \pi_C(\theta))(0)]f(\theta)d\theta = \int_{0}^{\bar{w}} g(\theta)\pi_C(\theta)f(\theta)d\theta$$

Then as long as $U_G(Accept|DS) > 0 > U_G(Accept|CVD)$, we have a separating equilibrium where $\sigma_I = (DS|\theta > \bar{w}, CVD|\theta < \bar{w})$ and $\sigma_G = (Accept|DS, Reject|CVD)$. Consequently, the "hard test" of the DS allows the Government to screen between strongly and weakly injured groups.

However, it is worth noting that depending on the position of the cutpoint, there may be some groups with types $\theta_L \in [\bar{w}, w]$ such that $g(\theta_L) < 0$. In other words,

it may be that the Government provides protection to some groups that it would prefer not to. Thus, while institutions allow for some degree of strategic information transfer in the case of a separating equilibrium, there is not necessarily *perfect* revelation of information.

## A Degenerate Case: Considering Institutional Design

As mentioned earlier, a degenerate case of the model is where an interest group is choosing between pursuing a case via an international institution or via unilateral protection from the government, which in this model would be when:

$$\pi_C(\theta) = 1, \ \forall \theta \in \Theta \text{ and } c_C = 0$$

The mathematics of this are simply what is obtained when one applies these values to the model, but the substantive interpretation is different. In this case, we are not talking about selecting between institutional mechanisms, but about why a firm might choose to pursue a claim via an international institution at all, given that there is a chance that this claim might be rejected. The model suggests that even if governments would prefer to protect all strongly injured firms without having to deal with the uncertainty of going through an international institution, groups may still pursue protection via these institutions if it can help screen between groups. Thus, this degenerate case focuses one's attention on a potentially important reason why governments might agree to institutions with external arbitration; namely, that such arbitration (or the threat of it) may provide governments with information that allows them to better select groups to protect in order to satisfy their domestic objective function.

This can also help to provide insight into the important question of institutional

design. First, we can consider government's welfare under different equilibria in the degenerate case. A pooling equilibrium on unilateral protection is what you would have if there was no international institution through which to screen cases, and the outcome in this scenario would hinge on whether you have:

$$\int_0^w g(\theta)f(\theta)d\theta \geq 0$$

If this condition holds, all groups would apply for protection and receive it. If it does not, all groups would apply for protection and would be rejected. The utility to Government in a world without institutions that can independently evaluate and overturn claims is thus:

$$max\left(\int_0^w g(\theta)f(\theta)d\theta, 0\right)$$

In contrast, under the separating equilibrium, groups with higher types self-select into the institutional/legal mechanism for pursuing protection, while others pursue unilateral protection and are rejected. Thus, the utility to government is:

$$\int_{\bar{w}}^w g(\theta)\pi_D(\theta)f(\theta)d\theta$$

Which is greater than zero by the conditions of a separating equilibrium obtained earlier, and thus higher than what Government gets under the pooling equilibrium in which no firm is protected. They are better off in this case than the "everyone gets protection" equilibrium whenever the following condition holds:

$$\int_{\bar{w}}^w g(\theta)\pi_D(\theta)f(\theta)d\theta > \int_0^w g(\theta)f(\theta)d\theta$$
$$\leftrightarrow \int_{\bar{w}}^w g(\theta)\pi_D(\theta)f(\theta)d\theta > \int_0^{\bar{w}} g(\theta)f(\theta)d\theta + \int_{\bar{w}}^w g(\theta)f(\theta)d\theta$$
$$\leftrightarrow \underbrace{\int_{\bar{w}}^w g(\theta)\pi_D(\theta)f(\theta)d\theta}_{\alpha} - \underbrace{\int_{\bar{w}}^w g(\theta)f(\theta)d\theta}_{\beta} > \underbrace{\int_0^{\bar{w}} g(\theta)f(\theta)d\theta}_{\Delta}$$

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We can unpack the different components of this to get some insight into when having an institution will be preferred by Government. First, it is not immediately clear whether $\alpha$ or $\beta$ is greater, since it may be the case that $g(\theta)$ is negative for some values of $\theta \in [\bar{w}, w]$. This can be thought of as an added benefit to Government; perhaps there are some cases they end up pursuing, even in a separating equilibrium, which they would rather have an international institution overturn, because such cases were just "mixed up" with the good cases in the separating equilibrium.

However, for simplicity, let's consider a situation where $g(\theta) > 0, \ \forall \theta \in [\bar{w}, w]$. In this case, $\alpha < \beta$, so $\alpha - \beta < 0$. However, it is also the case that $\Delta < 0$ by the implications of the construction of the separating equilbrium; otherwise Government would not reject upon observing a request for unilateral protection. Thus the trade-off here for government becomes the following: does having an institution lead to enough "good" cases being overturned that it's worse than the cost of giving protection to more of the "bad" types?

This gives some rationale for why governments might set up international institutions with binding arbitration procedures that assess a lot of information to make technical determinations of fact, but which also tend to skew towards leaving protectionist claims unchallenged. The flexibility to protect certain groups is important to governments (the no protection equilibrium is worse than any screening equilibrium), but it is also usually the case that protecting all groups makes them worse off than if they were able to extract some degree of private information from those groups.

Thus, the model can account for why the administration of trade remedies has shifted since the 1950s from a compensation-based efficient breach structure, to one of meeting criteria in order to invoke such trade remedies (Pelc 2011). We would expect this to be the case if governments can benefit from leveraging this threat of international arbitration to induce groups to separate, even if it means that some of their trade remedies end up getting overturned. In contrast, a system in which governments simply pay a cost to temporarily exit an agreement would provide them with no additional ability to sort between these domestic groups.

## Shifts in Protectionist Sentiment

Since the election of President Trump in 2016, there has been a significant shift in the way that trade remedies and trade institutions have been used by the US government, in a way that seems largely inconsistent with prior practice, and which threatens to upend the stability of international institutions like the WTO.[8] While at first glance these changes might seem inconsistent with the screening story outlined in this paper, the model can in fact provide significant insight into the situation by treating the changes as the result of an upward shift in protectionist sentiment.

Specifically, the model would treat a significant upward shift in protectionist sentiment in the government as a shift upward in $g(\theta)$. Thus, we can consider the comparative statics exercise of assessing what happens in the model when $g(\theta)$ increases.

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[8]The use of Section 232 security exemptions to protect steel, aluminum, and (possibly) automobiles has been singled out by many as a particular threat to the stability of the international trade regime.

To start, a shift upward in $g(\theta)$ makes the "everyone gets protection" equilibrium more likely, as it increases the likelihood that the pooling condition of the model is met, i.e.:

$$\mathbb{E}[g(\theta)|AllCVD] = \int_0^w g(\theta)f(\theta)d\theta \geq 0$$

Clearly $\mathbb{E}[g(\theta)|AllCVD]$ will be higher as $g(\theta)$ increases across all $\theta$, and thus it is more likely to be above zero. Thus the model's predictions fit well with what we have observed during the Trump administration, i.e. a situation where virtually every petition by an interest group has been pursued by the government after an upwards shift in protectionist sentiment.[9]

Perhaps even more importantly, we can also consider what impact an upward shift in protectionist sentiment would have on the value placed by the government on the *institution itself*. Recall from the section on institutional design that a government prefers institutional regulation to a world of unilateral protection if:

$$\int_{\underline{w}}^w g(\theta)\pi_D(\theta)f(\theta)d\theta > \int_0^{\overline{w}} g(\theta)f(\theta)d\theta + \int_{\overline{w}}^w g(\theta)f(\theta)d\theta$$

If $g(\theta)$ increases, the downside risk entailed in $\pi_D(\theta)$, where institutions reject cases determined by the government to be worth pursuing, becomes more important than the benefits obtained from screening out low types - particularly given that fewer types (if any) are likely to fall below the threshold where $g(\theta) < 0$. As a consequence, an upward shift in protectionist sentiment makes the government less likely to value the institution, and consequently more likely to risk its collapse.

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[9] As examples, historically, safeguard measures have been pursued by US governments in less than 50% of the instances in which the USITC gave the government the opportunity to impose them, and Section 232 has been used only twice out of 14 investigations (Bown and Joseph 2017). As of the time this was written, the Trump administration had pursued both safeguards cases that had gone through the USITC (on washing machines and solar panels), had implemented Section 232 tariffs on steel and aluminum, and had launched a Section 232 investigation into autos and auto parts.

## Varying Benefits Across Institutions/Mechanisms

Up until this point, the model has assumed that the benefits to both players from protection are the same across institutions. This is useful for considering cases where the main reason for selecting a more stringent institution is the signaling value, but it is also worth considering what the impact of allowing these valuations to vary across institutions would be, given that this more closely accords with reality.

In particular, let's consider a case where $v_D(\theta)$ and $v_C(\theta)$ are different, with $v_D(\theta) > v_C(\theta)$. This says that a interest group values a positive outcome from DS more highly than they value a positive outcome from CVD. This could describe a case where an interest's group's preferred outcome is to have a subsidy overturned via the WTO, but they may settle for CVDs because they have a higher likelihood of it being upheld.

For government, we can assign the opposite preferences, i.e. $g_D(\theta) < g_C(\theta)$. This is to capture the idea that Government may prefer to provide lower types with more limited forms of protection, like CVDs, but would be unwilling to pursue disputes on their behalf via international institutions. This way of modeling Government creates additional strategic tension between Government and the interest group, given that Government would prefer to induce types pursuing DS to choose CVDs instead; however, since the interest group is the first mover, this has few implications for which equilibria survive sequential rationality. The (slightly) modified game tree is shown in Figure 2.
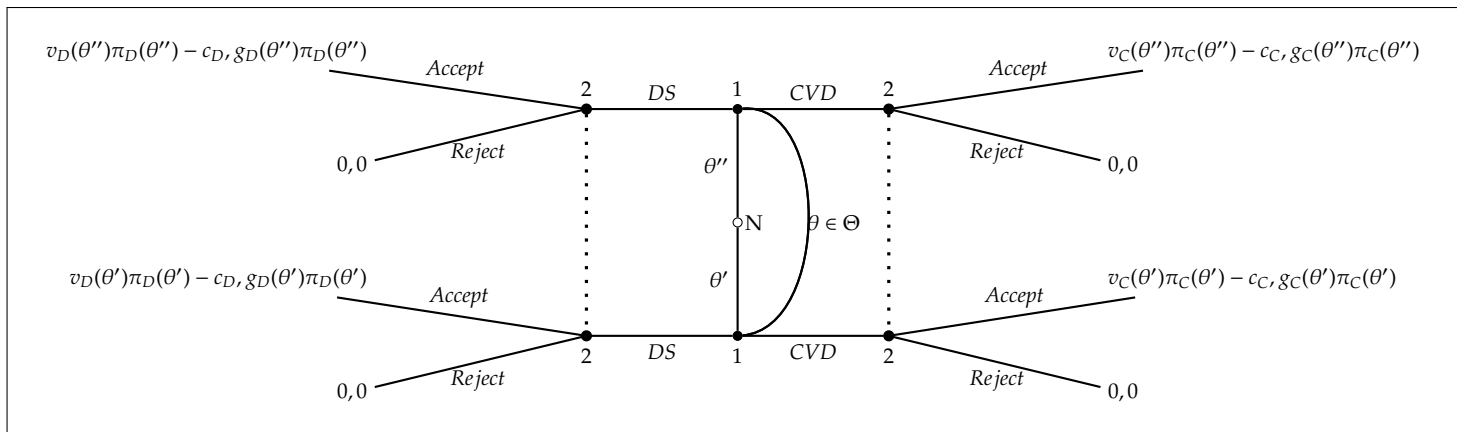
Figure 3.2: Institutional Selection Model with Varying Benefits

In this version of the model, pooling equilbria are constructed in a similar fashion as before, with minor adjustments to the pooling conditions and restrictions on off equilibrium path beliefs to account for the varying benefits across institutions. Separating equilibria, however, can be substantively different.

One possible separating equilibrium is constructed almost identically to before: i.e. if Government chooses a strategy of $\sigma_G = (Accept|DS, Reject|CVD)$, the analysis is largely the same, though the position of the cutpoint might change. This is because despite the fact that $g_C(\theta) > g_D(\theta)$, $\forall \theta \in \Theta$, it is still possible that in a separating equilibrium, the types being screened to CVDs are low enough that Government prefers not to pursue their claims.

However, a new separating equilibrium also becomes possible with varying benefits: one in which Government's strategy is $\sigma_G = (Accept|DS, Accept|CVD)$, and groups separate based on their types because of the distinct benefits to the different institutions. In this case, the cutpoint is defined implicitly by the type where

$U_I(DS) = U_I(CVD)$, or where:

$$v_D(\theta)\pi_D(\theta) - c_D = v_C(\theta)\pi_C(\theta) - c_C$$

However, this cutpoint may or may not exist depending on the shape of the probability and benefit functions. We can ensure existence with the following three additional assumptions:

(3.1) $$c_D = c_C$$

(3.2) $$\lim_{\theta \to w} \pi_D(\theta) = 1$$

(3.3) $$\lim_{\theta \to w} v_C(\theta) \neq \lim_{\theta \to w} v_D(\theta)$$

Substantively, this means that the absolute highest types have a near certain probability of their claims being upheld, and the costs of pursuing claims across institutions is the same. A quick proof is as follows.

*Proof.* We are comparing the following two values:

$$U_I(DS) = v_D(\theta)\pi_D(\theta) - c_D$$

$$U_I(CVD) = v_C(\theta)\pi_C(\theta) - c_C$$

Since $\pi_C > \pi_D$ and probabilities are bounded above by one, $lim_{\theta \to w}\pi_D(\theta) = 1$ implies that $lim_{\theta \to w}\pi_C(\theta) = 1$ by squeeze theorem. Thus by applying properties of limits, we can compute the following:

$$lim_{\theta \to w}U_I(DS) = (1)lim_{\theta \to w}v_D(\theta) - c_D$$

$$lim_{\theta \to w}U_I(CVD) = (1)lim_{\theta \to w}v_C(\theta) - c_C$$

Since $c_C$ and $c_D$ are identical, this suggests that as $\theta \to w$, $U_I(DS) > U_I(CVD)$, since $v_D(\theta) > v_C(\theta)$, $\forall \theta \in \Theta$. Thus, since we have earlier assumed that there

exists $\hat{\theta}$ such that $U_I(DS|\hat{\theta}) < 0$, which implies that $U_I(CVD|\hat{\theta}) > U_I(DS|\hat{\theta})$, by the continuity in $\theta$ of $v_C$ and $v_D$ and the intermediate value theorem, there must exist some $\theta$ such that $U_I(DS) = U_I(CVD)$. Thus a cutpoint $\bar{w}$ exists.    $\square$

Thus, under these assumptions, it makes sense for at least some group types to select into DS over CVD. We can thus establish a new separating equilibrium where $\sigma_G = (Accept|DS, Accept|CVD)$ and $\sigma_I = (DS|\theta > \bar{w}, CVD|\theta < \bar{w})$ if the following conditions hold for government:

$$\int_0^{\bar{w}} g_C(\theta)\pi_C(\theta)f(\theta)d\theta > 0$$

$$\int_{\bar{w}}^w g_D(\theta)\pi_D(\theta)f(\theta)d\theta > 0$$

Intuitively, this simply means that Government prefers to accept rather than reject claims whether or not an interest group is choosing to pursue that claim via CVD or DS. This becomes possible because of the varying benefits; in this case, they are willing to allocate different levels of protection to different groups depending on how strongly injured they are.

What does all this mean substantively? If different institutions/mechanisms provide different benefits to interest groups and governments, it becomes possible to sustain an equilibrium that reveals information about group types in which no claims via either mechanism are rejected. In some cases, this may more closely accord with what we observe: most claims for CVDs are approved by governments[10], and requests for dispute settlement are often pursued, but it is not an identical set of groups that applies for each.

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[10]The Commerce Department has ruled in favor of claimants more than 80% of the time (USITC 2010 p. 4).

**Allowing Pursuit of Multiple Mechanisms Simultaneously**

We can also consider the case where benefits vary across institutions/mechanisms, and interest groups can pursue more than one mechanism at the same time. This can reveal information about a firm's type in much the same way as we obtain in the separating equilibrium of previous versions of the model, but now we obtain different cutpoints for each institution, i.e. they are implicitly defined by:

$$v_C(\theta)\pi_C(\theta) = c_C$$

$$v_D(\theta)\pi_D(\theta) = c_D$$

If we call the cutpoint under CVD $\bar{w}_C$ and the cutpoint under DS $\bar{w}_D$, Government's best response to this cutpoint strategy is as follows:

$$\sigma_G(CVD) = \begin{cases} Accept & \text{if } \int_{\bar{w}_C}^{w} g_C(\theta)\pi_C(\theta)f(\theta)d\theta > 0 \\ \\ Reject & \text{if } otherwise \end{cases}$$

$$\sigma_G(DS) = \begin{cases} Accept & \text{if } \int_{\bar{w}_D}^{w} g_D(\theta)\pi_D(\theta)f(\theta)d\theta > 0 \\ \\ Reject & \text{if } otherwise \end{cases}$$

Thus, allowing interest groups to pursue multiple mechanisms simultaneously allows for an equilibrium in which some groups do exactly that, with Government accepting all claims via either mechanism. This accords well with what we sometimes observe; there are some instances where governments pursue multiple actions at the same time in response to interest group demands. Note, however, that this structure changes the cutpoints relative to a situation where government actions are mutually exclusive.

## The Role of the Government as a Gatekeeper

There is some variation in the degree to which governments serve as gatekeepers to these institutional mechanisms. Most prominently, investor-state dispute settlement (ISDS) mechanisms, which exist in a number of PTAs, allow firms to directly sue governments. Beyond these, procedures exist in certain agreements that allow private firms standing to petition for dispute resolution, as with Chapter 19 in NAFTA. Moreover, the procedure for implementing anti-dumping measures and countervailing duties in the US formally allows no role for the president or politics in the process, as the trade remedies are triggered almost automatically upon affirmative USITC and Commerce Department rulings; however, the evidence largely suggests that politics can enter into these proceedings via the Commerce Department determinations (Busch et. al 2008, p. 6-7).

Given that measures like ISDS have been some of the biggest sources of controversy in trade negotiations - Elizabeth Warren, for instance, has written multiple op-eds opposing ISDS, and written a letter to Robert Lighthizer urging him to oppose ISDS provisions in NAFTA renegotiations,[11] - it is worth evaluating what the model suggests the impact of removing the government's role as gatekeeper should be.

Perhaps unexpectedly, the model suggests that there should be little impact to doing so, *as long as the institution is properly calibrated*. Essentially, what drives the selection process in this model is that the probability of success compared to the cost of pursuing a dispute is such that only higher types find it incentive

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[11]See September 19, 2017. Senator Elizabeth Warren Press Release.

compatible to pursue disputes, so as long as these probability and cost functions are properly designed, it should not matter whether the government has the ability to reject claims, because they do not have the private information required to determine which groups have legitimate cases anyways.

Where things get more complicated is when there are multiple overlapping institutions, each with varying probabilities of success and costs to pursuing disputes. In this environment, there only needs to be one institution in the menu of possible options that is poorly calibrated for things to become problematic from the standpoint of governments; if there exists an institution that is too permissive relative to its costs, then low type firms will disproportionately use it to pursue weak legal cases.

Indeed, this seems to accord well with observation. Famously (and controversially), Philip Morris sued Uruguay over measures designed to reduce smoking (such as requiring graphic warnings on cigarette packages), and did so via ISDS provisions in a bilateral investment treaty between Switzerland and Uruguay.[12] This would appear to be a clear example of forum-shopping for the most permissive resolution process possible, and the weakness of the case was evident both on the merits (efforts to promote public health are explicitly protected in nearly every agreement of this sort), and its eventual outcome (Philip Morris lost). Statistical evidence also supports the claim that ISDS measures have become havens for weak cases; Pelc (2017) finds that investors win about 21% of indirect expropriation lawsuits via ISDS, which make up about 70% of the cases lodged via ISDS since 1993 (Pelc 2017, p. 562, p. 580).

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[12]July 8, 2016. The Associated Press.

In this sense, government gatekeeping provides a check on the institutional calibration process. If an institution is poorly calibrated, governments will simply reject the vast majority of claims that go through it, keeping it from becoming a serious issue. If, however, the institution is correctly calibrated, then it should be able to operate more or less autonomously.

# Applications

There are many possible outcomes described by this paper, which depend on the particular formulation of the model (e.g. allowing for varying benefits or not) and which of multiple equilibria occurs. However, we can broadly separate the outcomes into two broad categories: *informative* or *uninformative*. In informative equilibria, the selection of various mechanisms or institutions helps to reveal information about a group's type via screening. It is under these circumstances that institutions can be useful to governments in the ways described by this paper. Thus, it is worth considering what kinds of choices might allow for this kind of screening. I outline several different choices that interest groups can make between different institutions and instruments, each of which provides an opportunity for screening.

# Different Kinds of Screening

## Between International Institutions: Forum Shopping

One way in which screening might occur is between international institutions: for instance, if different institutions differ in their likelihoods for approving certain claims, then firms may lobby the government to pursue a particular dispute fo-

rum over another in a way that signals information. However, assessing when this might be the case is difficult, due to the overwhelmingly large number of PTAs with different legal standards that are not always easily placed in a "stringency hierarchy", as well as difficulties in measuring "success" or "failure" in any legal case (oftentimes a disputant will receive a mixture of favorable and unfavorable rulings), etc.

However, in the case of United States dispute resolution via the WTO and NAFTA, it would appear that the stylized facts correspond to the screening equilibria of the model. The NAFTA dispute resolution process was developed under heavy influence from the US Congress, and the US is the largest and most powerful country in NAFTA by far, so one would expect NAFTA to be the institution most likely to return a ruling favorable to US interests - indeed, there are instances in which the US has advocated for dispute resolution to be moved from the WTO to NAFTA after proceedings had begun, as with the Tuna-Dolphin II case between the US and Mexico (Pauwelyn 2009). However, despite this, the US has a high success rate for cases via the WTO, while their success rate via NAFTA is generally much lower (Guzman 2002, Davis 2012, McRae and Siwiec 2010). This accords well with the predictions of the model: while NAFTA is arguably more favorable to the United States, firms with the strongest cases select into pursuing their disputes via the WTO.

## Between Dispute Settlement and Trade Remedies

Another way in which screening might occur is between pursuing claims via dispute settlement or pursuing government support via some trade remedy. The cleanest example of this, as mentioned earlier, is subsidies: in the US, an interest

group can choose to lobby the government to challenge a foreign country's laws, or they can simply apply for CVDs via the USITC and Department of Commerce. Dispute settlement gives a much lower chance of success, given that the majority of CVDs go unchallenged; the worst case scenario of a CVD is that it is challenged by a foreign country, in which case it would go to dispute resolution anyway, and the firm would be no worse off than if they had started with dispute settlement. A similar selection process could be at work with antidumping: a firm could lobby to have foreign antidumping measures challenged, or could engage in "retaliatory" antidumping, whereby they request antidumping measures be put in place for imports that they are competing with (this works only if the industry has both imports and exports from the country in question).[13] The stylized facts on this are largely consistent with the separating equilibria of the model: as mentioned earlier, WTO claimants have extremely high rates of success, while nearly every trade remedy that has been challenged by the WTO has been ruled inconsistent with the trade law in at least one respect (Bown 2005 p. 1).

## Between Different Trade Remedies

Trade institutions allow firms to pursue temporary protection via multiple instruments: safeguard measures, antidumping provisions, or countervailing duties. In many ways, these mechanisms are substitutes for each other (see Bown 2013), but they vary in the stringency of what needs to be demonstrated in order to claim protection. For instance, both safeguard measures and antidumping duties require proof of injury to a firm, but antidumping measures require additional evidence that goods are being dumped at lower prices in the domestic market. Thus, if antidumping provisions have more stringent requirements, we might ex-

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[13]Blonigen and Bown (2003) provides evidence of this occurring.

pect screening to occur whereby firms with the strongest cases select into pursuing them.

The stylized facts, once again, appear to comport well with the separating equilibrium story. Many antidumping measures are approved (in the US, hundreds have been implemented since 1995) and only a small percentage (less than 10%) of these have been challenged via the WTO DSU (Bown 2015a). In contrast, safeguard measures have been employed by the United States only six times since 1995, of which four have been challenged and then found in violation of WTO law (Bown 2015b, Bown 2015c).

In a separating equilibrium, we would expect that screening would occur in which firms with stronger cases pursue antidumping, while those with weaker cases would choose to pursue safeguard measures and would then be rejected. What we observe is that very few firms formally apply for safeguards; I posit that this may be because applications to the USITC are not made in a vacuum, but in the shadow of prior lobbying activity (Hansen 1990). Firms already have a sense of the likelihood of their claim being approved by the government prior to filing a claim with the USITC; thus, the vast majority of such firms with weak cases have already been informally "pre-rejected" for safeguard provisions, and do not bother filing petitions.[14] Despite this, past presidents have still decided not to pursue the majority of cases that pass the USITC's determination of injury test; they rejected 21 out of 40 cases total from 1974-2016 (Bown and Joseph 2017).

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[14]This pre-filing rejection process as applied to CVDs is discussed openly by Commerce Department officials in The Washington Post, July 13 2003

The remaining cases that are pursued are those for which the United States has an overwhelming political interest in doing so irrespective of the strength of the case, as with the famous US steel tariffs of 2002. In contrast, pursuing an antidumping claim can be a way of signaling injury credibly to the government, which may at least partially account for the greater use of antidumping and relatively low rates of such measures being declined or overturned.

It is worth discussing a few caveats to this characterization. Some have argued that safeguards are more "costly" to use, noting that they formally require "serious injury" instead of "material injury", and noting that they used to require that compensation be provided to those countries that faced increased tariffs as a result of their use. However, safeguards were reformed with the advent of the WTO, and currently do not require compensation for any measures put in place for three years or less. It is also not entirely clear how the standards for assessing "material injury" are different from those for "serious injury", given that neither Congress nor the GATT precisely defined what makes injury "serious", with Congress providing only a list of characteristics that might be indicators (Sykes 2003, p. 7). However, if one believed that antidumping measures are uniformly less costly than safeguard measures, then one could argue the outcome resembles the pooling equilibria of the model more than the separating equilibria.

## Between International Institutions and Unilateral Protection

Perhaps most importantly, screening may also occur between firms pursuing protection via a potentially arbitrable mechanism embedded in some international institution versus pursuing protection unilaterally from the government. Any interest group could bypass the whole process of legal trade remedies and lobby

the government directly for protection: this would have a 0% probability of being overturned, as there would be no opportunity for it to be legally challenged. This corresponds to the degenerate case described during the discussion of the model. In this case, screening occurs when firms subject themselves to the legal costs and possibility of being overturned associated with pursuing protection via means subject to binding arbitration: in a separating equilibrium, only those with the strongest cases should be willing to do so, and those that try to pursue unilateral protection would usually have their efforts denied.

This also appears to correspond with reality. As recent events have made clear, the United States has always had a way of pursuing protection without fear of legal retaliation: security-based tariffs under Section 232, which are explicitly allowed for under GATT/WTO law. Section 232 claims do not require an assessment of injury by the USITC, and were designed with almost no restrictions on what government could define as "security", out of deference to state sovereignty. It has been described by trade law scholars as a "catch-all clause" that is "so broad, self-judging, and ambiguous that it can obviously be abused" (Jackson 1997 p. 230, Pelc 2016 p. 3). The clause is so broad that many trade lawyers have concluded that tariffs implemented under a security justification are unreviewable by WTO panels. Indeed, in the Commerce Department ruling advising that steel tariffs be implemented under Section 232, there is not even an attempt to provide reasoning along traditional security lines; instead, security is expanded to mean "economic security", with the Commerce Department arguing that establishing tariffs to ensure the long term economic health of the steel industry is important on these amorphous grounds (Commerce Department Report 2018).

Moreover, Section 232 has almost never been used to provide protection to any groups, despite the fact that it has such broad legal potential for abuse. In fact, the last time it was invoked by the US was in 1986 by the Reagan administration, and that was under very specific circumstances involving broader negotiations with the affected parties.[15] Why then have governments historically exercised this high degree of restraint? This paper provides a compelling rationale: that the only groups that would pursue protection via this mechanism would be those that could not meet the criteria of any other mechanism, and thus usually those with the lowest types.

As mentioned earlier, this kind of screening directs our attention to questions of institutional design. Why might governments want to establish international institutions that bind them to using trade protection in only a restricted set of circumstances? This paper provides an important new explanation for these choices: that governments may be better able to allocate protection because of the information obtained through the screening device of international institutions. This potential benefit is demonstrated in the model, and has not been explored in the existing literature. Furthermore, the model also provides insight into the conditions where governments might cease to value these benefits; notably, with a strong enough upward shift in protectionist sentiment, governments may no longer care to preserve the institutions that allow for this kind of screening, as they may believe themselves to be better off in an equilibrium in which they can protect as many groups as possible without restraint.

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[15] May 21 1986, The New York Times.

# Conclusion

As discussed in this paper, international institutions provide governments with a dizzying array of options for supporting domestic industries, each with varying costs and benefits. Governments can choose where (i.e. at which international institution) to file trade disputes, whether to launch a trade dispute or make use of "flexibility measures" in a retaliatory fashion, and which flexibility measure (amongst several) to use to impose temporary protection. This paper's model has demonstrated that governments can use this multitude of options to screen between domestic groups for those with the strongest legal cases, where the strength of a case is private information that interest groups would otherwise not have an incentive to honestly reveal.

This selection process can help to explain, amongst other things, why disputes pursued via the WTO have such a high rate of success (approximately 90%), and why claims via the ISDS have such a low rate of success. Furthermore, this paper has provided an explanation for the "criteria" based system of trade remedies, and demonstrated another way in which international institutions and their particular features can be valuable to governments, namely their potential for providing governments with useful information about domestic political groups. Thus, the paper contributes to our broad understanding of the areas of institutional selection and design, both within the domain of trade politics, and plausibly in other domains that share similar features.

## Taxability and Trade Policy

# Introduction

Centuries of history link trade policy to issues of state fiscal capacity. In the early years of the United States, for instance, the question of "free trade" was not about whether or not tariffs should be eliminated, but whether or not tariffs should be for protecting industries or "for revenue only" (Irwin 2017 p. 69). Lacking other significant means of collecting revenues, trade tariffs quickly displaced state-imposed direct taxes (poll and land) as the primary source of revenue. Indeed, reforms implemented by Alexander Hamilton in 1790 allowed for a reduction of direct taxation by roughly 85% (Edling and Kaplanoff 2004, p. 731).

At the time, this was considered both politically efficient (it helped reduce unrest over state taxation that had led to protests in the 1780s), and even economically efficient, as the administrative costs of imposing tariffs on foreign goods, which had only a few ports of entry, were far less than for direct taxes; an estimated 4 percent versus 20 percent of gross revenue, by some estimates (Balinky 1958, p. 57). Indeed, tariffs continued to provide the majority of US revenues until 1914, when income taxation was introduced (Reamer 2016).

However, despite this long, intertwined history, the political economy of trade literature has not devoted much attention to interrogating the relationship between fiscal capacity - i.e. the ability to tax different groups - and trade policy. While it is the conventional wisdom that tariffs will be implemented in cases where state capacity is relatively low, due to tariffs' relative ease of implementation, there has been little attempt to determine if the situation might be any more complicated than that.

This paper presents a formal model that demonstrates that while this conventional wisdom does capture some of the broader patterns in the use of trade tariffs (Dincecco and Prado 2012, Besley and Persson 2013), it does not tell the whole story. Indeed, what matters is not just the overall levels of fiscal capacity, but which specific groups a government is able to tax.

To see this, consider that trade tariffs are often treated as being determined by the outcome of some distributive politics game: who wins and loses, and which of these groups are likely to be politically influential due to a variety of factors, are used to predict which groups are likely to receive protection. Taxation and spending decisions are naturally treated in a similar fashion: politically influential groups may be more able to demand reductions in taxation, or increases in spending programs that benefit them.

However, if both these claims are true, then you have a game in which these two quantities are *jointly determined.* A group may, for instance, be willing to accept

reductions in tariff protection in return for more favorable tax treatment, or vice versa. Moreover, the ability to tax groups varies depending on a variety of characteristics. It may be more costly to implement taxation on certain groups over others due to variation in the degree of deadweight losses generated by taxing different quantities, differing administrative costs across different kinds of taxes, relative ease for such groups to evade taxation, or even the political optics costs to increasing taxation on certain groups. Given this, the degree to which the government can use tax policy as a substitute redistributive policy for tariffs is conditional on how significant these costs are.

Put differently, a government's ability to tax and spend creates the possibility that trade liberalization (or even protection) can be the outcome of a larger bargain with the parties implicated by protectionist policies. The losing parties to a policy can be compensated for their losses - and in the case of a move to freer trade, there should typically be a larger pie with which to compensate them. However, what is important for generating these bargains is not just the total fiscal capacity of the government, but whether or not value can be transferred from specific groups to others; i.e. from the winners to the losers. If the winners from a policy are not easily taxable, this reduces the likelihood that such a policy will be politically optimal from the standpoint of governments.

Thus, this paper contributes to our understanding of trade politics in a number of ways. First, it gives a more nuanced understanding of the relationship between fiscal capacity and trade policy; an increase in fiscal capacity may even make protectionist policies more likely if takes the form of greater ability to tax the

beneficiaries of protectionism. This new model of group-specific taxability and trade has significant implications for the empirical trade policy patterns we would expect to observe: in particular, we would expect trade policy to be biased in favor of factors, industries, and firm sizes that are easier to tax.

Second, it provides an explanation for an "efficiency puzzle" in the domain of trade politics. Namely, if freer trade increases the "size of the pie" being bargained over by generating aggregate gains for a country, it should theoretically be possible to redistribute the surplus so that every party is better off than in a protectionist equilibrium; i.e. the new outcome should be a Pareto-improvement. This paper shows that the ability to "compensate the losers" can be conditional on who the winners and losers are; in some cases, the winners will be taxable in a way that allows their gains to be "monetized" by the government, but in other cases they may be difficult to tax in a way that limits these compensatory bargains. Thus, this paper can provide insight into empirical patterns of trade protection, and can provide insight into an outstanding theoretical question about the seemingly inefficient use of trade protection as a means of redistributing income between groups.

## Overview of the Literature

As mentioned earlier, political economy scholars have generally treated trade policy as the outcome of political competition between the winners and losers of protectionist policies. As a consequence, much of the literature has focused on identifying who exactly those winners as losers are. Depending on the circumstances, such cleavages might occur along factor lines (Rogowski 1990), industry

lines (Scheve and Slaughter 2001, Hiscox 2002), or even between firms of differing sizes and productivities (Osgood 2016, Kim 2017). The literature has also made clear that both importers and exporters are important political actors in the determination of trade policies (Gilligan 1997, Betz 2017).

Beyond determining who the winners and losers are from protectionism, the literature has devoted significant attention to identifying the characteristics that lead governments to value certain groups over others when determining trade policy. This includes work on lobbying (Grossman and Helpman 1994, Goldberg and Maggi 1999, Gawande and Bandyopadhyay 2000, Bombardini 2008, Gawande et al. 2012), and the impact of democratization on trade policy (Mansfield et al. 2000, Milner and Kubota 2005).

This work establishes an important starting point for the analysis of this paper. This paper does not to seek to explain which groups are politically influential, or who benefits from particular trade policies; instead, these characteristics are treated as exogenous parameters in the model. The goal of this paper is instead to show that if we take these characteristics as given, varying the taxabilities of groups can change what we would expect the policy outcomes to be.

Another important literature emerges from the study of public finance in economics. This literature has been active in assessing the characteristics that lead to variation in taxes' deadweight losses, administration costs, and ease of evasion or avoidance (Slemrod and Yitzhaki 2002, Kumler et al. 2013, Best et. al 2015, etc.). The model of this paper also does not attempt to contribute new insight to

this literature; instead, costs of taxation are specified exogenously. However, this literature (along with the earlier cited trade literature) is important for the discussion of empirical applications of the model, and it is helpful in clarifying that the costs of taxation derive not only from deadweight losses created by distortions in production and consumption decisions, but also from difficulties associated with the administration and enforcement of taxes.

From political science, the "taxation and accountability" literature is also related to this paper. This literature, broadly speaking, suggests that governments provide policy concessions to groups as part of a bargain to encourage compliance with taxation (Bates and Lien 1985, Levi 1988, North and Weingast 1989, Timmons 2005, Martin 2014). Compliance with taxation, in this account, is "quasi-voluntary", with groups being able to extract concessions by threatening to withhold payment. Recently, this approach has been applied to trade, where it has been argued that industries in developing countries have exchanged compliance for protection (Queralt 2015, 2017).

Essentially, this literature would argue that providing favorable tax policy to groups makes those groups easier to tax. This paper argues, instead, that greater ability to tax groups leads to more provision of trade policy that benefits those groups; essentially reversing the causal arrow of the taxation and accountability story.

There are several advantages to this paper's explanation. To start, it applies to situations in which taxation is not really quasi-voluntary, but enforced through

threat of sanction by the government. Given the extensive efforts that groups and individuals often exert in order to avoid or evade taxation, and the collective action problem associated with it being individually rational not to pay taxes if the trade policy benefits to a group are non-excludable within that group, it is likely that such situations are quite common. For instance, even in Michigan (until recently policy changes), voluntary compliance with self-reporting of sales tax for purchases made online (e.g. through Amazon) was estimated to be about 2.5%.[1]

Even if we accept that taxation is sometimes quasi-voluntary, this paper suggests that the causality could go both ways, reinforcing the link we observe between taxation and favorable trade policies. Moreover, while this paper's argument is equally consistent with the evidence that taxation of industries is correlated with protectionist policies favoring those industries in the developing world (Queralt 2017), the model also produces new empirical implications about the relationship between exogenous features of a factor, industry or firm that affect the costs of taxation (e.g. demand elasticities of products, firm sizes, capital intensity) and trade policy. While a model rooted in quasi-voluntary compliance might predict that low costs to taxing a group would not impact their ability to extract favorable trade policies - or might even suggest that low costs would have a *negative* impact by reducing the leverage a group obtains by being able to credibly withhold concessions - this paper suggests that ease of taxation should track with favorable trade policies for reasons that have nothing to do with a bargain between the government and various private groups, and everything to do with the government's ability to extract resources via coercion and use them to support its own political

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[1]September 29, 2015. Detroit Free Press

agenda.

Finally, this paper relates to a number of papers across subfields in political science and economics that deal with the question of inefficient policy. In the international relations literature, the most prominent example is the work on bargaining models of conflict, which notes that because war is inefficient (i.e. destroys value relative to peace), peaceful bargains should be preferred absent some factor leading to bargaining breakdown, such as a commitment problem, information problem, or indivisibility issue (Fearon 1995, Powell 2004, Powell 2006). Despite the fact that international trade has similar characteristics - protection is also inefficient - there has been little attempt to address similar questions in the international political economy literature.[2]

In the economics literature, a number of explanations for inefficient policy more broadly have been posited, including bargaining models, commitment problems, and information asymmetries (Coate and Morris 1995, Acemoglu and Robinson 2001, Acemoglu 2003, Drazen and Limao 2008). Moreover, the result that the ability to redistribute income costlessly (i.e. perfect fiscal capacity) should lead governments to maximize national income and then use redistributive taxation is famously shown by Diamond and Mirrlees in a paper on production efficiency (Diamond and Mirrlees 1971). Their result is made in reference to a government maximizing a general social welfare function, but extending the result to a political objective function is straightforward: the main point is that a Pareto improving distribution of resources can always be achieved using production efficiency and

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[2]Prior to other papers in this dissertation.

redistributive taxation, if taxation is costless.

This paper explores the consequences for international trade of this costless taxation assumption breaking down, and more specifically, breaking down unequally across groups. The literature on this in economics generally assumes that efficient taxation is possible, and is more interested in explaining why less efficient taxes would be used instead of these readily available efficient means (Acemoglu 2003). The limited literature that takes seriously fiscal capacity as a constraint on efficient redistribution in politics focuses on the consequences for government's incentives to invest in public goods or fiscal capacity, but it does not explore the distributive consequences, nor does it consider cases where fiscal capacity may be unequal across groups (Acemoglu 2005, Besley and Persson 2009).

Consequently, this paper provides an explanation for inefficient trade policy that is not only absent from the existing political economy of trade literature, but also largely absent from the broader theoretical literature on inefficient policy.

# Model

## Set-up

The model outlined in this paper is a simple distributive politics model in which a government maximizes a weighted sum of the utilities to two groups. The weightings attached to each group represent the degree to which these groups are politically influential. The weightings are specified exogenously, and could be the result of any of a broad variety of factors identified by the trade literature as important to group influence. By assigning these exogenously, the model can be

applied generally to a broad variety of situations in which these weightings might vary.

Each group's utility function is concave, represented in explicit form by a natural logarithm. As a consequence, the government's objective function has a logarithmic Cobb-Douglas form. Both groups receive exogenous income $y_1, y_2 \in \mathbb{R}^+$ that can be conceptualized as all the income they receive that is not dependent on the trade policy in question. Each group can also receive additional income in one of two ways: (1) by receiving a favorable trade policy; (2) by receiving income taxed and redistributed to them from the other group.

Government first chooses the trade policy $\tau \in \{0, 1\}$. If $\tau = 1$, the government has chosen a protectionist policy, in which case Group 1 (whom we will set as the pro-protectionist group) gets additional income $v_1 \in \mathbb{R}^+$. If $\tau = 0$, the government has chosen free trade, in which case Group 2 (whom we will set as the pro-trade group) gets additional income $v_2 \in \mathbb{R}^+$. The government then chooses tax rates $t_1, t_2 \in [0, 1]$, which redistribute income from one group to the other.

However, some percentage of the income is lost in the process of transferring it from one group to the other due to various costs from taxation. As a consequence, only $\theta_1$ proportion of the income transferred from group 1 will be received by group 2, and only $\theta_2$ proportion of the income transferred from group 2 will be received by group 1. $\theta_1, \theta_2$ thus represent the different "taxabilities" of the different groups, by representing costs to taxation as a "leaky bucket".[3] Thus we have the

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[3]Note that by calling these "taxabilities", we are implicitly assuming that there is no efficiency loss in the subsidization process, since $\theta_1, \theta_2$ represent the total value lost in the transfer on both taxing and spending sides. A later section of the

following objective function for the government:

$$G(t_1, t_2, \tau) = \alpha ln[(1-t_1)(y_1+\tau v_1)+\theta_2 t_2(y_2+(1-\tau)v_2)]+ln[(1-t_2)(y_2+(1-\tau)v_2)+\theta_1 t_1(y_1+\tau v_1)]$$

Where $\alpha \in [0,1]$ is the weighting placed on Group 1, with Group 2's weighting normalized to 1 for simplicity. For reminder, $t_1, t_2 \in [0,1]$ are the tax rates, $\tau \in \{0,1\}$ is the choice of trade policy, $v_1, v_2 \in \mathbb{R}^+$ are the values to the different trade policies, and $\theta_1, \theta_2 \in [0,1]$ are the "taxabilities" of the different groups. Government chooses $t_1, t_2, \tau$ to maximize this objective function.

## Analysis

We can now begin to analyze the model. We want to demonstrate that $\tau^*$, i.e. the optimal trade policy for Government, is monotonically increasing in $\theta_1$. This would demonstrate that by increasing the taxability of Group 1 (i.e. the protectionist group), we increase the chances that a protectionist policy will be implemented.

Because the space of $\tau$ is discrete, we cannot find the relevant comparative static (how $\tau$ varies with $\theta_1$) by simply finding $\frac{\partial \tau^*}{\partial \theta_1}$ via the implicit function theorem, given that this derivative will not exist. Instead we can rely on monotone comparative statics, as outlined by Milgrom and Shannon (1994).[4] Monotone comparative statics shows that a sufficient condition for establishing a monotonic relationship between a choice variable and a parameter is a mathematical representation of complementarity between the two known as "increasing differences".[5] For this paper, this condition can be represented as follows,

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paper will discuss a possible application to "spendabilities".

[4]Also see Ashworth and Bueno de Mesquita 2006 for a discussion of its applications to models of politics.

[5]In fact, a slightly weaker condition known as the single-crossing condition is sufficient, though this is used less frequently.

$$G(\theta_1', \tau = 1) - G(\theta_1, \tau = 1) \geq G(\theta_1', \tau = 0) - G(\theta_1, \tau = 0)$$

for $\theta_1' > \theta_1$. Intuitively, this condition suggests that the incremental returns to increases in $\theta_1$ are higher when $\tau = 1$ than when $\tau = 0$; hence the "differences" are "increasing" as $\tau$ increases. This reflects complementarity in the sense that increases in $\theta_1$ are more impactful conditional on higher $\tau$.

Thus, we need to compare the cases where $\tau = 0$ with $\tau = 1$, i.e. what happens to Government's objective function when they choose each of the two possible trade policies.

$$G(t_1, t_2 | \tau = 0) = \alpha ln[(1 - t_1)(y_1) + \theta_2 t_2(y_2 + v_2)] + ln[(1 - t_2)(y_2 + v_2) + \theta_1 t_1(y_1)]$$

$$G(t_1, t_2 | \tau = 1) = \alpha ln[(1 - t_1)(y_1 + v_1) + \theta_2 t_2 y_2] + ln[(1 - t_2)(y_2) + \theta_1 t_1(y_1 + v_1)]$$

Conveniently, once $\tau$ is taken into account, $G$ is differentiable in $\theta_1$. So we take derivatives and obtain:

(4.1)
$$\frac{\partial G(\tau = 0)}{\partial \theta_1} = \frac{t_1 y_1}{(1 - t_2)(y_2 + v_2) + \theta_1 t_1 y_1}$$

(4.2)
$$\frac{\partial G(\tau = 1)}{\partial \theta_1} = \frac{t_1(y_1 + v_1)}{(1 - t_2)y_2 + \theta_1 t_1(y_1 + v_1)}$$

Now consider that in either case (whether $\tau = 0$ or $\tau = 1$), $t_1$ or $t_2$ will be at a corner solution of zero, given that taxation destroys value for any $\theta_1, \theta_2 \neq 1$. In other words, it would not make sense for government to transfer income in *both* directions, since they could simply transfer the net amount from one party to another and save the costs from taxation.

If $t_1 = 0$ in both cases, these derivatives are both equal to zero. Indeed, it makes sense that $\theta_1$ will have no effect on tariff policy if Government will refuse to tax

Group 1 in either case, since then taxation of Group 1 is not being employed at all. Also, if $t_1 = 0$ only when $\tau = 0$, then clearly (4.2) > (4.1), since (4.2) is positive but (4.1) is equal to zero. It is also immediately clear that there is no situation in which $t_1 = 0$ when $\tau = 1$ but $t_1 \neq 0$ when $\tau = 0$, because Government's objective function is concave in each group's income, and that would describe a situation where Government chooses to extract money from Group 1 only when that group starts off with less income.

If $t_1 \neq 0$ in both cases, implying $t_2 = 0$ in both cases, then we can compare:

(4.3) $$\frac{\partial G(\tau = 0)}{\partial \theta_1} = \frac{t_1 y_1}{y_2 + \theta_1 t_1 y_1 + v_2}$$

(4.4) $$\frac{\partial G(\tau = 1)}{\partial \theta_1} = \frac{t_1(y_1 + v_1)}{y_2 + \theta_1 t_1 y_1 + \theta_1 t_1 v_1}$$

We want to compare the values of these two derivatives. So, we can assess when (4.4) > (4.3) as follows:

$$\frac{t_1(y_1 + v_1)}{y_2 + \theta_1 t_1 y_1 + \theta_1 t_1 v_1} > \frac{t_1 y_1}{y_2 + \theta_1 t_1 y_1 + v_2}$$

$$\leftrightarrow (y_1 + v_1)(y_2 + \theta_1 t_1 y_1 + v_2) > y_1(y_2 + \theta_1 t_1 y_1 + \theta_1 t_1 v_1)$$

$$\leftrightarrow y_1 v_2 + v_1 y_2 + v_1 \theta_1 t_1 y_1 + v_1 v_2 > y_1 \theta_1 t_1 v_1$$

$$\leftrightarrow y_1 v_2 + v_1 y_2 + v_1 v_2 > 0$$

Which clearly must be the case, since $v_1, y_2, v_2 \in \mathbb{R}^+$. Thus we have demonstrated that:

$$\frac{\partial G(\tau = 1)}{\partial \theta_1} > \frac{\partial G(\tau = 0)}{\partial \theta_1}$$

Which is a statement of increasing differences. Thus, by monotone comparative statics, we have that $\tau^*$ is (weakly) monotonically increasing in $\theta_1$. In words, we have found that Government is more likely to impose protectionist measures when

the pro-protectionist group is easier to tax. Since the game is largely symmetric across groups, we could simply repeat the analysis to obtain the complementary conclusion that Government is more likely to propose freer trade when the pro-trade group is easier to tax.

# Applications

The model suggests that in addition to all the other factors that influence which trade policies are likely to be implemented by governments - e.g. who wins and loses from particular trade policies, the factors underlying group influence, etc. - the relative taxability of groups should also impact what trade policies we should expect to observe. In particular, we should expect trade policies to be biased towards whichever side of a trade-related political cleavage is easier to tax. With this in mind, we can consider some of the empirical implications we might expect from this model.

## Factor Cleavages

Political economists have often argued that political cleavages over trade may occur along factor lines, especially if we are considering the longer term patterns of trade policy (Rogowski 1990, Hiscox 2002). This follows from the economic predictions of Heckscher-Ohlin (HO). This paper would thus lead us to ask: which is more taxable, capital or labor? Land or labor? Skilled or unskilled labor?

The answers to these questions may depend on a number of factors, such as capital mobility, per-capita income (especially if there are fixed costs to taxation), or even the legal institutions of a country in question. As such, this is an area worth of a more sustained systematic empirical inquiry than is within the scope of this paper.

Nonetheless, we can speculate about the degree to which certain stylized facts seem to fit the story described by this model.

For instance, trade protection is generally more extensive in the developing world than the developed world (Moutos 2001). Given that poorer countries are usually relatively abundant in unskilled labor, an HO model would lead us to expect that freer trade in developing countries would broadly benefit unskilled labor relative to skilled labor. Naively, we might initially expect this to make trade liberalization an easier sell in the developing world, given that in developed countries much of the opposition to globalization has been structured around issues such as increased inequality, or the degree to which the wealthiest capture the gains, while we might expect the poorest to capture most of the gains of open trade in the developing world.

However, in many developing countries, the informal sector makes up a disproportionate portion of the economy, especially amongst unskilled workers. As such, the model suggests that we should expect trade policy to be biased against such workers. This could help to explain why developing countries are broadly more protectionist than developed countries.

Conversely, land may be one of the easiest factors to tax, given that it is immovable (unlike often highly mobile capital) and, as far as assets go, fairly difficult to hide. Commensurate with what this model would predict, we also see that agriculture often receives much higher levels of protection than other commodities, in what is often described as a puzzle by political economists (Thies and Porche 2007). This

paper may help to explain this regularity.

## Industry Cleavages

Especially in the short term, however, political economists have argued that cleavages might instead occur along industry lines, as predicted by Ricardo-Viner (Scheve and Slaughter 2001, Hiscox 2002). It is also certainly the case that industries vary in the degree to which they are taxable. Oil and many other natural resource industries, for instance, are easily observable, highly immobile, and capital intensive in a way that makes them especially easy to tax. Contrastingly, much of the service industry, and especially the freelance industry, is much more difficult to tax given that it can be diffuse and intangible. Thus, the model would predict that trade policy would be biased towards industries like oil and possibly biased against certain subareas of the service sector.

## Firm Cleavages

Trade-related cleavages might also occur along firm lines, given that a move to more open trade tends to lead to market consolidation around a smaller number of larger, highly-productive firms (Melitz 2003). This can lead to political divisions around trade agreements between these larger firms, who are also much more likely to be exporters, and smaller firms who may only sell their products in domestic markets, and who may be more likely to go out of business with an expansion of the size of the market (Osgood 2016, Kim 2017).

Whether larger or smaller firms are more easily taxable is not immediately obvious. On the one hand, smaller firms might be more difficult to tax, as they might have an easier time flying under the radar of tax auditors who may not see the

value in investing significant fixed costs to track and assess the tax compliance of relatively "small fish". On the other hand, larger firms may have more resources to invest in complicated strategies of tax avoidance, relocating to tax havens, etc. and might be better able to move their assets abroad to lower tax jurisdictions. This would lead us to expect that larger firms would be more difficult to tax.

Evidence presented by Hanlon, Mills, and Slemrod (2005) appears to suggest that larger firms engage in more tax avoidance. If this is the case, the model would predict that trade policy should be biased against larger firms in favor of small businesses.

## Capital Mobility

One particular source of taxability - asset mobility - has been the subject of significant discussion in the political science literature (Garrett 1995, Oatley 1999, Clark 2002, Clark et al. 2017). Given that this literature broadly argues that higher asset mobility should provide such asset holders with the ability to extract greater concessions from the government due to their better exit options, it is worth discussing why this paper might come to different conclusions.

Clark, Golder, and Golder (2017) consider asset mobility explicitly within the Exit, Voice, and Loyalty (EVL) framework proposed by Hirschman (1970). While they focus on the importance of exit options, equally important within this framework is the value the government places on "loyalty", often described as the "dependence" of government. This paper essentially argues that this component of the EVL framework is determined in part by taxabilities; if a government cannot tax you, then they have less of a stake in your success.

What then should we predict about the impact of increased asset mobility for a group on trade policy favoring that group? We might expect the effect to be ambiguous: on the one hand, exit options provide a group leverage to extract concessions, but on the other hand the government loses a reason to care about whether that group exits or not. Likely to be important in this case is $\alpha$, i.e. the weighting the government places on a group for reasons outside of their taxability. If a group is especially politically influential for independent reasons - e.g. if they are an important part of a government's winning coalition (Bueno de Mesquita et al. 2005) - then the ability to tax their gains to redistribute to others may not be as important a consideration for the government when deciding on trade policy.

## An Extension: "Spendability"

While this paper has focused on taxability of different groups - which is likely the area which exhibits the highest degree of variation in the world, and thus allows for the most interesting empirical implications - it is worth noting that given that tax costs are simply modeled as a "leaky bucket" in the process of transferring income from one group to another group, these costs could just as easily be interpreted as limits on the ability of a government to spend revenues in a way that targets a particular group.

A historical example provides an interesting illustration of how this might work. In the United States, during the 1820-1830s, the United States adopted a series of tariffs to protect manufacturers in northeast states; tariffs rose on dutiable imports from 25 percent in 1820 to about 62 percent in 1830, which is the highest level in US history (Irwin 2017 p. 154). These tariffs were bitterly opposed by southern

states who complained about the indirect effects that such tariffs had on the prices of exported staple crops that their economies largely depended on. The Midwest, in contrast, was mostly indifferent on the question of tariffs, but held the balance of power in the US Senate.

At a time in the United States where taxation and spending programs were heavily limited, one needed two out of three of the North, South, and Midwest to agree to any policy for it to have a chance of passing. How might one then construct a bargain in favor of any particular trade policy?

The strategy of the Northeners was to link import tariffs - which in effect, were an indirect tax on the South - to investments in "internal improvements" (e.g. roads, railways, etc.) in the Midwest so as to buy the Midwest's support for import duties. One important reason why this particular coalition evolved- i.e. between the North and the Midwest - is because the government lacked policy options with which to buy off the South directly, since the South had easy access to seaports, and thus was not geographically positioned to benefit from federal spending on such projects (Irwin 2017, p. 159). Similarly, there was no easy way to tax the benefits of freer trade to the South and redistribute it to the North and Midwest, given that trade tariffs were essentially the only revenue collection instrument being regularly used during that time period. Thus, in this case, varying taxabilities and spendabilities across regions led to a particular bargain being implemented in favor of protection, while a world with different taxabilities and spendabilities might very well have led to a different outcome.

# Conclusion

In this paper, I have identified how the typical story about fiscal capacity and trade policy - that lower fiscal capacity leads to greater reliance on trade tariffs due to lack of other means of raising revenues - provides us with useful insight into the broader patterns of trade protection, but does not tell the entire story. Instead, a model that looks at the relative taxability of different factors, industries, or firms can provide a good deal of new insight into the particular trade policies we would expect to be implemented under different circumstances. Moreover, this paper's model provides insight into why inefficient trade protection might emerge despite the fact that it destroys value; namely, because the beneficiaries of aggregate-income improving open trade policies may not be taxable in a way that would allow their gains to be used by governments to buy off the groups that lose from freer trade.

# APPENDIX

## Chapter 2 Appendix

# Appendix

## Proof of Proposition 1

The first order condition characterizing $\tau^*$ is:

$$\frac{\partial u_1(\tau, S_t | T = 1, R = 0)}{\partial \tau} = \frac{\partial \pi_1}{\partial \tau} + \psi_s \left( \alpha \frac{\partial W}{\partial \tau} + \beta \frac{\partial \pi_2}{\partial \tau} \right) = 0$$

First, implicitly differentiate the first order condition (for expositional purposes, call this $H$) with respect to $\tau$.

$$\frac{\partial H}{\partial \tau} = \frac{\partial^2 \pi_1}{\partial \tau^2} + \psi_s \alpha \frac{\partial^2 W}{\partial \tau^2} + \psi_s \beta \frac{\partial^2 \pi_2}{\partial \tau^2}$$

Note that all these terms are negative as a result of earlier concavity assumptions.

Next, differentiate $H$ with respect to $\epsilon$.

$$\frac{\partial H}{\partial \epsilon} = \psi_s \alpha \frac{\partial^2 W}{\partial \tau \partial \epsilon}$$

This is also negative, given the assumption made on the conditioning effect of $\epsilon$.

Now, apply implicit function theorem:

$$\frac{\partial \tau^*}{\partial \epsilon} = -\frac{\psi_s \alpha \frac{\partial^2 W}{\partial \tau \partial \epsilon}}{\frac{\partial^2 \pi_1}{\partial \tau^2} + \psi_s \alpha \frac{\partial^2 W}{\partial \tau^2} + \psi_s \beta \frac{\partial^2 \pi_2}{\partial \tau^2}} < 0$$

Which is, thus, clearly negative. However, if $\tau^* = 0$, then it is at the bound and cannot be reduced any further. A similar approach is applied to determining the effect of $\beta$.

$$\frac{\partial H}{\partial \beta} = \psi_s \frac{\partial \pi_2}{\partial \tau}$$

Applying implicit function theorem again returns:

$$\frac{\partial \tau^*}{\partial \beta} = -\frac{\frac{\partial \pi_2}{\partial \tau}}{\frac{\partial^2 \pi_1}{\partial \tau^2} + \alpha \frac{\partial^2 W}{\partial \tau^2} + \beta \frac{\partial^2 \pi_2}{\partial \tau^2}} < 0$$

Which is clearly negative given that SIG 2 is a downstream SIG and thus wants lower $\tau$, implying that $\frac{\partial \pi_2}{\partial \tau} < 0$. Again, if $\tau^* = 0$, then it is at the bound and cannot be reduced any further.

## Proof of Lemma 1

We have the objective function for SIG 1:

$$u_1(\tau, S_t | T = 1, R = 0) = \pi_1(\tau) + \psi_s(\alpha W(\tau, 0, \epsilon, \rho) + \beta \pi_2(\tau) - \alpha W(0, 0, \epsilon, \rho) - \beta \pi_2(0))$$

We can determine how the indirect utility function $\gamma(T = 1) = u_1(\tau^*, S_t | T = 1, R = 0)$ varies with the parameters by applying envelope theorem. Take the simple partial derivative of the objective function with respect to each parameter, and then evaluate at the optimum. So for $\epsilon$, we have:

$$\frac{\partial \gamma}{\partial \epsilon}(T = 1) = \psi_s \alpha \frac{\partial W}{\partial \epsilon}(\tau = \tau^*) + \psi_s \alpha \frac{\partial W}{\partial \epsilon}(\tau = 0)$$

Which since we have assumed in the model setup that $\frac{\partial W}{\partial \epsilon}(\tau = 0) = 0$ (i.e. that import demand elasticities only matter to welfare if tariffs are positive) gives us:

$$\frac{\partial \gamma}{\partial \epsilon}(T = 1) = \psi_s \alpha \frac{\partial W}{\partial \epsilon}(\tau = \tau^*)$$

This will be negative for any $\tau^* > 0$, given that we have assumed that $\frac{\partial W}{\partial \epsilon}(\tau) > 0$ for any $\tau > 0$. If $\tau^* = 0$, then the above with be zero, as we have assumed that $\frac{\partial W}{\partial \epsilon}(\tau = 0) = 0$.

Similarly, we find the comparative statics for $\beta$ as follows:

$$\frac{\partial \gamma}{\partial \beta}(T = 1) = \psi_s(\pi_2(\tau^*) - \pi_2(0))$$

Given that $\frac{\partial \pi_2}{\partial \tau} < 0$, we know that for any $\tau^* > 0$, $\pi_2(\tau^*) < \pi_2(0)$, such that $\pi_2(\tau^*) - \pi_2(0) < 0$. Thus, for any $\tau^* > 0$, $\frac{\partial \gamma}{\partial \beta}(T = 1) < 0$. However, if $\tau^* = 0$, then $\pi_2(\tau^*) - \pi_2(0) = 0$, so $\frac{\partial \gamma}{\partial \beta}(T = 1) = 0$ as well.

## Proof of Proposition 2

We have the following first order condition characterizing the optimal $R^*$.

$$\frac{\partial u_1(R, S_t | T = 0, \tau = 0)}{\partial R} = 1 + \psi_s\left(\alpha \frac{\partial W(0, R, \epsilon, \rho)}{\partial R}\right) = 0$$

First, implicitly differentiate the first order condition (call this $H$ for expositional purposes) with respect to $R$.

$$\frac{\partial H}{\partial R} = \psi_s \alpha \frac{\partial^2 W}{\partial R^2}$$

By earlier concavity assumptions, this is negative. Next, differentiate $H$ with respect to $\rho$.

$$\frac{\partial H}{\partial \rho} = \psi_s \alpha \frac{\partial^2 W}{\partial R \partial \rho}$$

Which is positive, given the assumption made about the conditioning effect of $\rho$. Applying implicit function theorem, we get:

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$$\frac{\partial R^*}{\partial \rho} = -\frac{\psi_s \alpha \frac{\partial^2 W}{\partial R \partial \rho}}{\psi_s \alpha \frac{\partial^2 W}{\partial R^2}} = -\frac{\frac{\partial^2 W}{\partial R \partial \rho}}{\frac{\partial^2 W}{\partial R^2}}$$

Which is positive, as a result of the above. However, if $R^* = 0$, then it is at the lower bound, such that decreases in $\rho$ cannot have any additional effect.

Next, we wish to determine how $\gamma(T = 0)$ varies with $\rho$. We have the objective function for SIG 1:

$$u_1(R, S_t | T = 0, \tau = 0) = R + \pi_1(0) - \psi_s((\alpha W(0, 0, \epsilon, \rho) - \alpha W(0, R, \epsilon, \rho))$$

We use envelope theorem. Take the simple partial derivative with to $\rho$ and then evaluate at $R^*$:

$$\frac{\partial \gamma}{\partial \rho}(T = 0) = \psi_s \alpha \left( \frac{\partial W}{\partial \rho}(R^*) - \frac{\partial W}{\partial \rho}(0) \right)$$

Which since it was assumed that $\frac{\partial W}{\partial \rho}(0) = 0$, gives us:

$$\frac{\partial \gamma}{\partial \rho}(T = 0) = \psi_s \alpha \frac{\partial W}{\partial \rho}(R^*)$$

Which is strictly positive for any $R^* > 0$, and is equal to zero at $R^* = 0$, by earlier assumptions.

## Proof of Proposition 3

Consider any optimal tariff rate $\tau^*$. We can construct an $\hat{R}$ that provides the equivalent amount of transfers to SIG 1:

$$\hat{R} = \pi_1(\tau^*) - \pi_1(0)$$

Now we can compare the utility obtained from $\tau^*$ and $\hat{R}$, taking into account the required lobby contributions. In particular, we have:

$$u_1(\tau^*, S_t | T = 1, R = 0) = \pi_1(\tau^*) + \psi_s(\alpha W(\tau^*, 0, \epsilon, \rho) + \beta \pi_2(\tau^*) - \alpha W(0, 0, \epsilon, \rho) - \beta \pi_2(0))$$

and:

$$u_1(\hat{R}, S_t | T = 0, \tau = 0) = \hat{R} + \pi_1(0) - \psi_s((\alpha W(0, 0, \epsilon, \rho) - \alpha W(0, \hat{R}, \epsilon, \rho))$$

We have constructed $\hat{R}$ such that it is equal to $\pi_1(\tau^*) - \pi_1(0)$, and thus, $\hat{R} + \pi_1(0) = \pi_1(\tau^*) - \pi_1(0) + \pi_1(0) = \pi_1(\tau^*)$. Therefore, $u_1(\tau^*, S_t | T = 1, R = 0) < u_1(\hat{R}, S_t | T = 0, \tau = 0)$ iff:

$$\alpha W(\tau^*, 0, \epsilon, \rho) + \beta \pi_2(\tau^*) - \alpha W(0, 0, \epsilon, \rho) - \beta \pi_2(0) < \alpha W(0, \hat{R}, \epsilon, \rho) - \alpha W(0, 0, \epsilon, \rho)$$

Given that $\frac{\partial \pi_2}{\partial \tau} < 0$, we know that $\pi_2(\tau^*) \leq \pi_2(0)$, such that $\pi_2(\tau^*) - \pi_2(0) \leq 0$. Moreover, by Assumption 1, we know that $\alpha W(\tau^*, 0, \epsilon, \rho) - \alpha W(0, 0, \epsilon, \rho) < \alpha W(0, \hat{R}, \epsilon, \rho) - \alpha W(0, 0, \epsilon, \rho)$. Thus, $u_1(\tau^*, S_t | T = 1, R = 0) < u_1(\hat{R}, S_t | T = 0, \tau = 0)$, implying $\hat{R}$ is preferred to $\tau^*$ in any single period of the game.

$\hat{R}$ thus demonstrates that there exists a compensation level that improves upon $\tau^*$ in any single period. By properties of optimality, it must be the case that $u_1(\hat{R}, S_t | T = 0, \tau = 0) \leq u_1(R^*, S_t | T = 0, \tau = 0) = \gamma(T = 0)$.

If $\tau^* = 0$, then either $R^* > 0$, which is preferred, or $R^* = 0$, in which case the payoffs to both protection and compensation are equal to $\pi_1(0)$.

This completes the proof of Proposition 3.

## Proof of Lemma 2

Proof by contrapositive. Proposition 3 demonstrates that for any $\tau \neq 0$, there exists an $R \neq 0$ that is strictly preferred to it. Thus, $\tau^* \neq 0 \rightarrow R^* \neq 0$, which is logically equivalent to $R^* = 0 \rightarrow \tau^* = 0$. This completes the proof of Lemma 2.

## Proof of Proposition 4

We start by showing that $\frac{\partial \tau^*}{\partial \psi_s} \leq 0$. The first order condition characterizing $\tau^*$ is:

$$\frac{\partial u_1(\tau, S_t | T = 1, R = 0)}{\partial \tau} = \frac{\partial \pi_1}{\partial \tau} + \psi_s \left( \alpha \frac{\partial W}{\partial \tau} + \beta \frac{\partial \pi_2}{\partial \tau} \right) = 0$$

First, implicitly differentiate the first order condition (for expositional purposes, call this $H$) with respect to $\tau$.

$$\frac{\partial H}{\partial \tau} = \frac{\partial^2 \pi_1}{\partial \tau^2} + \psi_s \alpha \frac{\partial^2 W}{\partial \tau^2} + \psi_s \beta \frac{\partial^2 \pi_2}{\partial \tau^2}$$

Note that all these terms are negative as a result of earlier concavity assumptions. Next, differentiate $H$ with respect to $\psi_s$:

$$\frac{\partial H}{\partial \psi_s} = \alpha \frac{\partial W}{\partial \tau} + \beta \frac{\partial \pi_2}{\partial \tau}$$

Since $\frac{\partial W}{\partial \tau} < 0$ and $\frac{\partial \pi_2}{\partial \tau}$ by earlier assumption, this is clearly also negative. Thus, by implicit function theorem we have that:

$$\frac{\partial \tau^*}{\partial \psi} = -\frac{\alpha \frac{\partial W}{\partial \tau} + \beta \frac{\partial \pi_2}{\partial \tau}}{\frac{\partial^2 \pi_1}{\partial \tau^2} + \psi_s \alpha \frac{\partial^2 W}{\partial \tau^2} + \psi_s \beta \frac{\partial^2 \pi_2}{\partial \tau^2}} < 0$$

The comparative statics are strict unless $\tau^* = 0$, in which case increases in $\psi_s$ cannot reduce $\tau^*$ below its lower bound.

Next, let's show that $\frac{\partial R^*}{\partial \psi} \leq 0$. We have the following first order condition characterizing the optimal $R^*$.

$$\frac{\partial u_1(R, S_t | T = 0, \tau = 0)}{\partial R} = 1 + \psi_s \left( \alpha \frac{\partial W(0, R, \epsilon, \rho)}{\partial R} \right) = 0$$

First, implicitly differentiate the first order condition (call this $H$ for expositional purposes) with respect to $R$.

$$\frac{\partial H}{\partial R} = \psi_s \alpha \frac{\partial^2 W}{\partial R^2}$$

By earlier concavity assumptions, this is negative. Next, differentiate $H$ with respect to $\psi$.

$$\frac{\partial H}{\partial \psi} = \alpha \frac{\partial W(0, R, \epsilon, \rho)}{\partial R}$$

Which is also negative by earlier concavity assumption. Thus, by implicit function theorem, we have:

$$\frac{\partial R^*}{\partial \psi} = -\frac{\alpha \frac{\partial W(0, R, \epsilon, \rho)}{\partial R}}{\psi_s \alpha \frac{\partial^2 W}{\partial R^2}} < 0$$

This comparative static is also strict unless $R^* = 0$.

Next, let's show that both $\gamma(T = 0)$ and $\gamma(T = 1)$ are decreasing in $\psi_s$. First, we take the objective function for SIG 1 when $T = 1$, i.e.:

$$u_1(\tau, S_t | T = 1, R = 0) = \pi_1(\tau) + \psi_s(\alpha W(\tau, 0, \epsilon, \rho) + \beta \pi_2(\tau) - \alpha W(0, 0, \epsilon, \rho) - \beta \pi_2(0))$$

To find $\frac{\partial \gamma}{\partial \psi_s}(T = 1)$, we apply envelope theorem to the above, taking the simple partial derivative with respect to $\psi_s$ and evaluating at $\tau^*$.

$$\frac{\partial \gamma}{\partial \psi_s}(T = 1) = \alpha W(\tau^*, 0, \epsilon, \rho) + \beta \pi_2(\tau^*) - \alpha W(0, 0, \epsilon, \rho) - \beta \pi_2(0)$$

Since $\frac{\partial W}{\partial \tau} < 0$ and $\frac{\partial pi_2}{\partial \tau} < 0$, it must be the case that $\alpha W(0, 0, \epsilon, \rho) > \alpha W(\tau^*, 0, \epsilon, \rho)$ and $\beta \pi_2(0) > \beta \pi_2(\tau^*)$. Thus, $\frac{\partial \gamma}{\partial \psi_s}(T = 1) < 0$ at any $\tau^* \neq 0$. If $\tau^* = 0$, the above expression is also equal to zero.

Similarly, we take the objective function when $T = 0$:

$$u_1(R, S_t | T = 0, \tau = 0) = R + \pi_1(0) - \psi_s((\alpha W(0, 0, \epsilon, \rho) - \alpha W(0, R, \epsilon, \rho))$$

Then we apply envelope theorem, obtaining:

$$\frac{\partial \gamma}{\partial \psi_s}(T = 0) = \alpha W(0, 0, \epsilon, \rho) - \alpha W(0, R, \epsilon, \rho)$$

Which since $\frac{\partial W}{\partial R} < 0$, $\alpha W(0, R, \epsilon, \rho) > \alpha W(0, 0, \epsilon, \rho)$, which implies that $\frac{\partial \gamma}{\partial \psi_s}(T = 0) <$ 0, at any $R^* \neq 0$. If $R^* = 0$, the above expression is also equal to zero.

This completes the proof of Proposition 4.

## Proof of Proposition 7

Recall that a corner solution of $\tau^* = 0$ is obtained when:

$$\frac{\partial u_1(\tau, S_t | T = 1, R = 0)}{\partial \tau}(\tau = 0) = \frac{\partial \pi_1}{\partial \tau}(\tau = 0) + \psi_s \left( \alpha \frac{\partial W}{\partial \tau}(\tau = 0) + \beta \frac{\partial \pi_2}{\partial \tau}(\tau = 0) \right) < 0$$

To determine the impact of parameters on the likelihood that this will hold, we simply need to find out which parameters decrease $\frac{\partial u_1}{\partial \tau}$. So we differentiate $u_1$ again with respect to the different parameters, obtaining the following:

$$\frac{\partial^2 u_1(\tau, S_t | T = 1, R = 0)}{\partial \tau \partial \epsilon} = \psi_s \alpha \frac{\partial^2 W}{\partial \tau \partial \epsilon}$$
$$\frac{\partial^2 u_1(\tau, S_t | T = 1, R = 0)}{\partial \tau \partial \beta} = \psi_s \frac{\partial \pi_2}{\partial \tau}$$
$$\frac{\partial^2 u_1(\tau, S_t | T = 1, R = 0)}{\partial \tau \partial \psi_s} = \alpha \frac{\partial W}{\partial \tau} + \beta \frac{\partial \pi_2}{\partial \tau}$$

By earlier assumption, we have that $\psi_s > 0$, $\alpha > 0$, $\frac{\partial^2 W}{\partial \tau \partial \epsilon} < 0$, $\forall \tau \neq 0$. So the first of these is clearly negative. Similarly, since $\psi_s > 0$ and $\frac{\partial \pi_2}{\partial \tau} < 0$, the second is negative. Finally, since $\alpha > 0$, $\frac{\partial W}{\partial \tau} < 0$, $\beta > 0$, and $\frac{\partial \pi_2}{\partial \tau} < 0$, the third is also negative. Therefore, increases in $\epsilon, \beta$ and $\psi_s$ all lead it to be more likely that the condition leading to $\tau^* = 0$ will hold by decreasing $\frac{\partial u_1}{\partial \tau}$.

Similarly, for compensation we have the following condition leading to $R^* = 0$.

$$\frac{\partial u_1(R, S_t | T = 0, \tau = 0)}{\partial R}(R = 0) = 1 + \psi_s \left( \alpha \frac{\partial W(0, R, \epsilon, \rho)}{\partial R}(R = 0) \right) < 0$$

So we differentiate as follows:

$$\frac{\partial^2 u_1(R, S_t | T = 0, \tau = 0)}{\partial R \partial \rho} = \psi_s \alpha \frac{\partial^2 W(0, R, \epsilon, \rho)}{\partial R \partial \rho}$$

$$\frac{\partial^2 u_1(R, S_t | T = 0, \tau = 0)}{\partial R \partial \psi_s} = \alpha \frac{\partial W(0, R, \epsilon, \rho)}{\partial R}$$

Since $\psi_s > 0$, $\alpha > 0$, and $\frac{\partial^2 W(0,R,\epsilon,\rho)}{\partial R \partial \rho} > 0$, $\forall R \neq 0$, the first of these is positive. Since $\alpha > 0$ and $\frac{\partial W(0,R,\epsilon,\rho)}{\partial R} < 0$, the second is negative. So increases in $\rho$ lead to a lower likelihood of a corner solution of $R^* = 0$, while increases in $\psi_s$ increase the likelihood of $R^* = 0$. This completes the proof of Proposition 7.

## Proof of Proposition 9

The shift in bargaining power leads to the following new value functions $V'_1(\sigma^1)$ and $V'_1(\sigma^2)$ for SIG 1, which we can compare to the original value functions $V_1(\sigma^1)$ and $V_1(\sigma^2)$

- $V'_1(\sigma^1) = \theta \phi^P + \delta \frac{\theta \phi^F}{1-\delta} = \theta V_1(\sigma^1)$

- $V'_1(\sigma^2) = \frac{\theta \chi^P}{1-\delta} = \theta V_1(\sigma^2)$

Thus, $V'_1(\sigma^1) > V'_1(\sigma^2)$ if and only if:

$$\theta V_1(\sigma^1) > \theta V_1(\sigma^2)$$

Which for any $\theta > 0$ is equivalent to:

$$V_1(\sigma^1) > V_1(\sigma^2)$$

This completes the proof of Proposition 9.

**BIBLIOGRAPHY**

# BIBLIOGRAPHY

[1] ACEMOGLU, D. Why Not a Political Coase Theorem? Social Conflict, Commitment, and Politics. *Journal of Comparative Economics 31*, 4 (2003), 620–652.

[2] ACEMOGLU, D. Politics and Economics in Weak and Strong States. *Journal of Monetary Economics 52*, 7 (Oct. 2005), 1199–1226.

[3] ACEMOGLU, D., AND ROBINSON, J. Inefficient Redistribution. *American Political Science Review 95*, 3 (2001), 649–661.

[4] ALT, J. E., FRIEDEN, J., GILLIGAN, M. J., RODRIK, D., AND ROGOWSKI, R. The Political Economy of International Trade Enduring Puzzles and an Agenda for Inquiry. *Comparative Political Studies 29*, 6 (1996), 689–717.

[5] ASHWORTH, S., AND MESQUITA, E. B. D. Monotone Comparative Statics for Models of Politics. *American Journal of Political Science 50*, 1 (2006), 214–231.

[6] AUSTEN-SMITH, D., AND WRIGHT, J. R. Competitive Lobbying for a Legislator's Vote. *Social Choice and Welfare 9*, 3 (1992), 229–257.

[7] AUSTEN-SMITH, D., AND WRIGHT, J. R. Counteractive Lobbying. *American Journal of Political Science 38*, 1 (1994), 25–44.

[8] BACCINI, L., DUR, A., ELSIG, M., AND MILEWICZ, K. The Design of Preferential Trade Agreements. In *Preferential Trade Agreements and the WTO: A New Era*, W. T. Report, Ed. edited by the WTO, 2011.

[9] BAGWELL, K., AND STAIGER, R. W. *The Economics of the World Trading System*. MIT Press, 2004.

[10] BAILEY, M. A., GOLDSTEIN, J., AND WEINGAST, B. R. The Institutional Roots of American Trade Policy: Politics, Coalitions, and International Trade. *World Politics 49* (1997), 03.

[11] BAKER, A. Who Wants to Globalize? Consumer Tastes and Labor Markets in a Theory of Trade Policy Beliefs. *American Journal of Political Science 49*, 4 (2005), 924–38.

[12] BALDWIN, R. E., AND ROBERT-NICOUD, F. Entry and Asymmetric Lobbying: Why Governments Pick Losers. *Journal of the European Economic Association 5*, 5 (2007), 1064–1093.

[13] BALINKY, A. *Albert Gallatin: Fiscal Theories and Policies*. Rutgers University Press, 1958.

[14] BATES, R. H., AND DONALD LIEN, D.-H. A Note on Taxation, Development, and Representative Government , A Note on Taxation, Development, and Representative Government. *Politics & Society 14*, 1 (Mar. 1985), 53–70.

[15] BERNHEIM, B. D., AND WHINSTON, M. D. Menu Auctions, Resource Allocation, and Economic Influence. *The Quarterly Journal of Economics 101*, 1 (1986), 1–31.

[16] BESLEY, T., AND PERSSON, T. The Origins of State Capacity: Property Rights, Taxation, and Politics. *American Economic Review 99*, 4 (Sept. 2009), 1218–1244.

[17] Besley, T., and Persson, T. Taxation and Development. In *Handbook of Public Economics*, A. J. Auerbach, R. Chetty, M. Feldstein, and E. Saez, Eds., vol. 5. Elsevier, June 2013.

[18] Best, M. C., Brockmeyer, A., Kleven, H. J., Spinnewijn, J., and Waseem, M. Production versus Revenue Efficiency with Limited Tax Capacity: Theory and Evidence from Pakistan. *Journal of Political Economy 123*, 6 (Dec. 2015), 1311–1355.

[19] Betz, T. Trading Interests: Domestic Institutions, International Negotiations, and the Politics of Trade. *The Journal of Politics* (2017).

[20] Betz, T. Domestic Institutions, Trade Disputes, and the Monitoring and Enforcement of International Law. *International Interactions 44* (2018), 04.

[21] Blonigen, B. A. Industrial Policy and Downstream Export Performance. *The Economic Journal 126*, 595 (2016), 1635–59.

[22] Blonigen, B. A., and Bown, C. P. Antidumping and retaliation threats. *Journal of International Economics 60*, 2 (2003), 249–273.

[23] Bombardini, M. Firm Heterogeneity and Lobby Participation. *Journal of International Economics 75*, 2 (2008), 329–48.

[24] Bonoli, G. The Political Economy of Active Labor-Market Policy. *Politics & Society 38*, 4 (Dec. 2010), 435–457.

[25] Bown, C. P. Trade Remedies and World Trade Organization Dispute Settlement: Why Are So Few Challenged? *The Journal of Legal Studies 34*, 2 (2005), 515–55.

[26] Bown, C. P. How Different Are Safeguards from Antidumping? Evidence From U.S. Trade Policies Towards Steel. *Review of Industrial Organization v 42* (2013), 449–481.

[27] Bown, C. P. Global Antidumping Database. Report, The World Bank, 2015a.

[28] Bown, C. P. Global Safeguard Database. Report, The World Bank, 2015b.

[29] Bown, C. P. Global Dispute Database. Report, The World Bank, 2015c.

[30] Bown, C. P., and Joseph, J. Solar and Washing Machine Safeguards in Context: The History of US Section 201 Use. Report, Peterson Institute for International Economics, 2017.

[31] Brutger, R. Litigation for Sale: Private Firms and WTO Dispute Escalation. 2017.

[32] Bueno de Mesquita, B., Smith, A., Morrow, J. D., and Siverson, R. M. *The Logic of Political Survival*. MIT Press, 2005.

[33] Burgoon, B. Globalization and Welfare Compensation: Disentangling the Ties That Bind. *International Organization 55*, 3 (2001), 509–551.

[34] Busch, M. L. Overlapping Institutions, Forum Shopping, and Dispute Settlement in International Trade. *International Organization:* (2007), 309–338.

[35] Busch, M. L., Raciborski, R., and Reinhardt, E. *Does the Rule of Law Matter? The WTO and US Antidumping Investigations*. 2008.

[36] Chong, A., and Gradstein, M. Firm-Level Determinants of Political Influence. *Economics & Politics 22*, 3 (2010), 233–256.

[37] Clark, W. R. Partisan and Electoral Motivations and the Choice of Monetary Institutions Under Fully Mobile Capital. *International Organization 56*, 4 (2002), 725–749.

[38] Clark, W. R., Golder, M., and Golder, S. N. The British Academy Brian Barry Prize Essay: An Exit, Voice and Loyalty Model of Politics. *British Journal of Political Science 47*, 04 (2017), 719–748.

[39] Coate, S., and Morris, S. On the Form of Transfers to Special Interests. *Journal of Political Economy 103*, 6 (1995), 1210–1235.

[40] Collard-Wexler, A., and Loecker, J. D. Reallocation and Technology: Evidence from the US Steel Industry. *American Economic Review 105*, 1 (2015), 131–71.

[41] Collins, B. *Trade Adjustment Assistance for Workers*. Congressional Research Service, 2014.

[42] Davis, C. L. Overlapping Institutions in Trade Policy. *Perspectives on Politics 7*, 1 (Mar. 2009), 25–31.

[43] Davis, C. L. *Why Adjudicate? Enforcing Trade Rules in the WTO*. Princeton University Press, 2012.

[44] Diamond, P., and Mirrlees, J. Optimal Taxation and Public Production: I–Production Efficiency. *American Economic Review 61*, 1 (1971), 8–27.

[45] Dincecco, M., and Prado, M. Warfare, Fiscal Capacity, and Performance. *Journal of Economic Growth 17*, 3 (Sept. 2012), 171–203.

[46] Dixit, A. Chapter 6 Tax Policy in Open Economies. In *Handbook of Public Economics*, A. J. Auerbach and M. Feldstein, Eds. Elsevier, 1985, pp. 313–374.

[47] Dixit, A., and Londregan, J. Redistributive Politics and Economic Efficiency. *The American Political Science Review 89*, 4 (1995), 856–866.

[48] DOC. The Effect of Imports on the National Security. Report, Department of Commerce, 2018.

[49] Drazen, A., and Limao, N. A Bargaining Theory of Inefficient Redistribution Policies. *International Economic Review 49*, 2 (2008), 621–657.

[50] Edling, M. M., and Kaplanoff, M. D. Alexander Hamilton's Fiscal Reform: Transforming the Structure of Taxation in the Early Republic. *The William and Mary Quarterly 61*, 4 (2004), 713–744.

[51] Ehrlich, S. D., and Hearn, E. Does Compensating the Losers Increase Support for Trade? An Experimental Test of the Embedded Liberalism Thesis. *Foreign Policy Analysis 10*, 2 (2014), 149–64.

[52] Fearon, J. D. Rationalist Explanations for War. *International Organization 49* (1995), 03.

[53] Garrett, G. Capital Mobility, Trade, and the Domestic Politics of Economic Policy. *International Organization 49*, 4 (1995), 657–687.

[54] Gawande, K., and Bandyopadhyay, U. Is Protection for Sale? Evidence on the Grossman-Helpman Theory of Endogenous Protection. *The Review of Economics and Statistics 82*, 1 (2000), 139–52.

[55] Gawande, K., Krishna, P., and Olarreaga, M. Lobbying Competition Over Trade Policy. *International Economic Review 53*, 1 (2012), 115–32.

[56] Gilligan, M. J. *Empowering Exporters: Reciprocity, Delegation, and Collective Action in American Trade Policy*. University of Michigan Press, 1997.

[57] Goldberg, P., and Maggi, G. Protection for Sale: An Empirical Investigation. *American Economic Review 89*, 5 (1999), 1135–55.

[58] GRAY, J., AND POTTER, P. B. K. Trade and Volatility at the Core and Periphery of the Global Economy. *International Studies Quarterly 56*, 4 (2012), 793–800.

[59] GROSSMAN, G. M., AND HELPMAN, E. Protection for Sale. *The American Economic Review 84*, 4 (1994), 833–850.

[60] GUZMAN, A. The Political Economy of Litigation and Settlement at the WTO. Research Paper, Public Law and Legal Theory, 2002.

[61] HALL, R. L., AND DEARDORFF, A. V. Lobbying as Legislative Subsidy. *The American Political Science Review 100*, 1 (2006), 69–84.

[62] HANLON, M., MILLS, L. F., AND SLEMROD, J. B. An Empirical Examination of Corporate Tax Noncompliance. SSRN Scholarly Paper ID 891226, Social Science Research Network, Rochester, NY, June 2005.

[63] HANSEN, W. L. The International Trade Commission and the Politics of Protectionism. *American Political Science Review 84* (1990), 01.

[64] HATHAWAY, O. A. Positive Feedback: The Impact of Trade Liberalization on Industry Demands for Protection. *International Organization 52* (1998), 03.

[65] HAYS, J. C. *Globalization and the New Politics of Embedded Liberalism*. Oxford University Press, Aug. 2009.

[66] HAYS, J. C., EHRLICH, S. D., AND PEINHARDT, C. Government Spending and Public Support for Trade in the OECD: An Empirical Test of the Embedded Liberalism Thesis. *International Organization 59* (2005), 02.

[67] HIRSCHMAN, A. O. *Exit, Voice, and Loyalty: Responses to Decline in Firms, Organizations, and States*. Harvard University Press, 1970.

[68] HISCOX, M. J. *International Trade and Political Conflict: Commerce, Coalitions, and Mobility*. Princeton University Press, 2002.

[69] HOWSE, R. *Settling Trade Remedy Disputes: When the WTO Forum Is Better than the NAFTA*. CD Howe Communique, 1998.

[70] IRWIN, D. *Clashing Over Commerce: A History of US Trade Policy*. Long-term factors in economic development. University of Chicago Press, 2017.

[71] JACKSON, J. H. *The World Trading System: Law and Policy of International Economic Relations*. MIT Press, 1997.

[72] KEE, H. L., NICITA, A., AND OLARREAGA, M. Import Demand Elasticities and Trade Distortions. *The Review of Economics and Statistics 90*, 4 (2008), 666–82.

[73] KEOHANE, R. O. *After Hegemony: Cooperation and Discord in the World Political Economy*. Princeton University Press, 1984.

[74] KIM, I. S. Political Cleavages within Industry: Firm-Level Lobbying for Trade Liberalization. *American Political Science Review 111*, 1 (2017), 1–20.

[75] KIM, S. Y. Openness, External Risk, and Volatility: Implications for the Compensation Hypothesis. *International Organization 61*, 1 (2007), 181–216.

[76] KING, A. *Trade Ambassador Nominee Commits to Visiting New Balance & Working to Address Risks to Maine Jobs*. 2013. Published: Press Release.

[77] KING, A. *Collins, King, Poliquin, Announce Significant Victory for Made-in-USA Athletic Footwear Provision*. 2016. Published: Press Release.

[78] Klobuchar, A. *After Call from Dayton, Klobuchar, Franken, and Nolan, Department of Labor Approves Trade Adjustment Assistance for Steel Workers and Miners Impacted by Layoffs*. 2015. Published: Press Release.

[79] Kono, D. Y. Optimal Obfuscation: Democracy and Trade Policy Transparency. *American Political Science Review 100* (2006), 03.

[80] Koremenos, B. Loosening the Ties That Bind: A Learning Model of Agreement Flexibility. *International Organization 55* (2001), 02.

[81] Koremenos, B., Lipson, C., and Snidal, D. The Rational Design of International Institutions. *International Organization 55* (2001), 04.

[82] Kucik, J., and Pelc, K. J. Can International Legal Rulings Deter? Financial Markets Say Yes. 2014.

[83] Kucik, J., and Pelc, K. J. Over-commitment and Backsliding in International Trade. *European Journal of Political Research 55* (2016), 02.

[84] Kucik, J., and Reinhardt, E. Does Flexibility Promote Cooperation? An Application to the Global Trade Regime. *International Organization 62* (2008), 03.

[85] Kumler, T., Verhoogen, E., and Frías, J. A. Enlisting Employees in Improving Payroll-Tax Compliance: Evidence from Mexico. Working Paper 19385, National Bureau of Economic Research, Aug. 2013.

[86] Levi, M. *Of Rule and Revenue*. University of California Press, 1988.

[87] Mansfield, E. D., Milner, H. V., and Rosendorff, B. P. Free to Trade: Democracies, Autocracies, and International Trade. *American Political Science Review 94*, 2 (June 2000), 305–321.

[88] Margalit, Y. Costly Jobs: Trade-Related Layoffs, Government Compensation, and Voting in U.S. Elections. *American Political Science Review 105* (2011), 01.

[89] Martin, L. Taxation, Loss Aversion, and Accountability: Theory and Experimental Evidence for Taxation's Effect on Citizen Behavior. 2014.

[90] Mayda, A. M., and Rodrik, D. Why Are Some People (and Countries) More Protectionist than Others? *European Economic Review 49*, 6 (2005), 1393–1430.

[91] McRae, D., and Siwiec, J. NAFTA Dispute Settlement: Success or Failure? In *Arturo Oropeza Garcia*, America, Ed. Corporacion Industrial Grafica, Mexico City, 2010.

[92] Melitz, M. J. The Impact of Trade on Intra-Industry Reallocations and Aggregate Industry Productivity. *Econometrica 71*, 6 (2003), 1695–1725.

[93] Milgrom, P., and Shannon, C. Monotone Comparative Statics. *Econometrica 62*, 1 (1994), 157–180.

[94] Milner, H. V. *Interests, Institutions, and Information: Domestic Politics and International Relations*. Princeton University Press, 1997.

[95] Milner, H. V., and Kubota, K. Why the Move to Free Trade? Democracy and Trade Policy in the Developing Countries. *International Organization 59*, 1 (2005), 107–43.

[96] Moore, M. O. *The Rise and Fall of Big Steel's Influence on U.S. Trade Policy*. In Krueger, Anne O. *The Political Economy of American Trade Policy.* University of Chicago Press, 1996.

[97] Moutos, T. Why Do Poor Democracies Collect a Lot of Tariff Revenue? *Economics & Politics 13*, 1 (Mar. 2001), 95–112.

[98] Nooruddin, I., and Rudra, N. Are Developing Countries Really Defying the Embedded Liberalism Compact? *World Politics 66*, 4 (2014), 603–40.

[99] North, D. C., and Weingast, B. R. Constitutions and Commitment: The Evolution of Institutions Governing Public Choice in Seventeenth-Century England. *The Journal of Economic History 49*, 4 (Dec. 1989), 803–832.

[100] Oatley, T. How Constraining is Capital Mobility? The Partisan Hypothesis in an Open Economy. *American Journal of Political Science 43*, 4 (1999), 1003–1027.

[101] Osgood, I. Differentiated Products, Divided Industries: Firm Preferences over Trade Liberalization. *Economics & Politics 28*, 2 (2016), 161–80.

[102] Pauwelyn, J. Editorial Comment: Adding Sweeteners to Softwood Lumber: The WTO-NAFTA 'Spaghetti Bowl' Is Cooking. *Journal of International Economic Law 9*, 1 (2006), 197–206.

[103] Pauwelyn, J. Mexico Secures WTO Tuna-Dolphin Panel; U.S. Seeks Move To NAFTA. *Inside U.S. Trade 24* (Apr. 2009), 2009.

[104] Pelc, K. Seeking Escape: The Use of Escape Clauses in International Trade Agreements. *International Studies Quarterly 53* (2011), 02.

[105] Pelc, K. The Politics of Precedent in International Law: A Social Network Application. *American Political Science Review 108* (2014), 03.

[106] Pelc, K. *Making and Bending Rules: The Design of Exceptions and Escape Clauses in Trade Law*. Cambridge University Press, 2016.

[107] Pelc, K. What Explains the Low Success Rate of Investor-State Disputes? *International Organization 71* (2017), 03.

[108] Peters, M. E. Trade, Foreign Direct Investment, and Immigration Policy Making in the United States. *International Organization 68*, 4 (2014), 811–44.

[109] Powell, R. The Inefficient Use of Power: Costly Conflict with Complete Information. *American Political Science Review 98* (2004), 02.

[110] Powell, R. War as a Commitment Problem. *International Organization 60* (2006), 01.

[111] Queralt, D. From Mercantilism to Free Trade: A History of Fiscal Capacity Building. *Quarterly Journal of Political Science 10*, 2 (June 2015), 221–273.

[112] Queralt, D. Protection Not for Sale, But for Tax Compliance. *International Studies Quarterly 61*, 3 (Sept. 2017), 631–641.

[113] Reamer, A. Before the U.S. Tariff Commission: Congressional Efforts to Obtain Statistics and Analysis for Tariff-setting, 1789–1916. In *A Centennial History of the United States International Trade Commission*, P. R. Bardos, Ed. USITC, 2016.

[114] Rickard, S. J. Welfare versus Subsidies: Governmental Spending Decisions in an Era of Globalization. *The Journal of Politics 74*, 4 (2012), 1171–83.

[115] Rodriguez, L. V. *Trade Shifts in Footwear*. USITC., 2015.

[116] Rodrik, D. *Political Economy of Trade Policy*. Elsevier, Handbook of International Economics v.III, 1995.

[117] Rodrik, D. Why Do More Open Economies Have Bigger Governments? *Journal of Political Economy 106*, 5 (1998), 997–1032.

[118] Rogowski, R. *Commerce and Coalitions: How Trade Affects Domestic Political Alignments*. Princeton University Press, Princeton, N.J., 1990.

[119] Rosendorff, B. P. Stability and Rigidity: Politics and Design of the WTO's Dispute Settlement Procedure. *American Political Science Review 99*, 03 (2005), 389–400.

[120] Rosendorff, B. P., and Milner, H. V. The Optimal Design of International Trade Institutions: Uncertainty and Escape. *International Organization 55* (2001), 04.

[121] Ross, W. L. Budget in Brief Fiscal Year 2018. Report, Department of Commerce, 2018.

[122] Rudra, N. Globalization and the Decline of the Welfare State in Less-Developed Countries. *International Organization 56*, 2 (2002), 411–45.

[123] Ruggie, J. G. International Regimes, Transactions, and Change: Embedded Liberalism in the Postwar Economic Order. *International Organization 36* (1982), 02.

[124] Ryu, J., and Stone, R. W. Plaintiffs by Proxy: A firm-level approach to WTO dispute resolution. *The Review of International Organizations 13*, 2 (2018), 273–308.

[125] Scheve, K. F., and Slaughter, M. J. What Determines Individual Trade-Policy Preferences? *Journal of International Economics 54*, 2 (2001), 267–292.

[126] Slemrod, J., and Yitzhaki, S. Tax Avoidance, Evasion, and Administration. In *Handbook of Public Economics*, A. J. Auerbach and M. Feldstein, Eds., vol. 3. Elsevier, Jan. 2002, pp. 1423–1470.

[127] Sykes, A. The Safeguards Mess: A Critique of WTO Jurisprudence. *Law & Economics Working Papers* (May 2003).

[128] Thies, C. G., and Porche, S. The Political Economy of Agricultural Protection. *The Journal of Politics 69*, 1 (2007), 116–127.

[129] Timmons, J. F. The Fiscal Contract: States, Taxes, and Public Services. *World Politics 57*, 4 (July 2005), 530–567.

[130] Trebilcock, M. J. *Understanding Trade Law*. Edward Elgar Pub, Cheltenham, UK; Northampton, MA, 2011.

[131] Trebilcock, M. J., and Howse, R. *The Regulation of International Trade, 3rd Edition*, 3rd ed. Routledge, London; New York, 2005.

[132] USITC. The Economic Effects of Significant U.S. Import Restraints. Report, United States International Trade Commission, 2009.

[133] USITC. Import Injury Investigations Case Statistics FY 1980-2008. Report, United States International Trade Commission, 2010.

[134] USITC. Budget Justification Fiscal Year 2016. Report, United States International Trade Commission, 2016.

[135] USTR. Fiscal Year 2015 Budget. Report, Office of the United States Trade Representative, 2015.

[136] Vlandas, T. Mixing apples with oranges? Partisanship and active labour market policies in Europe. *Journal of European Social Policy 23*, 1 (Feb. 2013), 3–20.

[137] Walter, S. Globalization and the Welfare State: Testing the Microfoundations of the Compensation Hypothesis. *International Studies Quarterly 54* (2010), 403–426.

[138] Wibbels, E., and Ahlquist, J. S. Development, Trade, and Social Insurance. *International Studies Quarterly 55*, 1 (2011), 125–49.