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Author(s): Gene M. Grossman and Elhanan Helpman

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Protection for Sale

By GENE M. GROSSMAN AND ELHANAN HELPMAN*

We develop a model in which special-interest groups make political contributions in order to influence an incumbent government's choice of trade policy. The interest groups bid for protection with their campaign support. Politicians maximize their own welfare, which depends on total contributions collected and on the welfare of voters. We study the structure of protection that emerges in the political equilibrium and the contributions by different lobbies that support the policy outcome. We also discuss why the lobbies may in some cases prefer to have the government use trade policy to transfer income, rather than more efficient means. (JEL F13, D72)

When asked why free trade is so often preached and so rarely practiced, most international economists blame "politics." In representative democracies, governments shape trade policy in response not only to the concerns of the general electorate, but also to the pressures applied by special interests. Interest groups participate in the political process in order to influence policy outcomes. Politicians respond to the incentives they face, trading off the financial and other support that comes from heeding the interest groups' demands against the alienation of voters that may result from the implementation of socially costly policies.

Research on the political economy of trade policy seeks to explain the equilibrium outcome of this political process. Two different approaches are prominent in the literature (which is nicely surveyed by Arye Hillman [1989]). One approach stresses *political competition* between opposing candidates. In the work of Stephen Magee et al.

(1989) and Hillman and Heinrich Ursprung (1988), competing parties announce trade policies that they are committed to implement, if elected. Organized lobby groups evaluate their members' prospects under the alternative policy proposals and contribute resources to the party that promises them the highest level of welfare. The parties use the resources to sway voters, who are presumed to be imperfectly informed about candidates' positions. In making their giving decisions, the lobbies weigh the benefit of an increased probability of their favorite party being elected against the direct cost of the donation. Clearly, the motivation for political contributions in this setting is to influence the election outcome.

The second approach, pioneered by George Stigler (1971) and first used to study endogenous protection by Hillman (1982), sees economic policies as being set by an incumbent government seeking to maximize its *political support*. The "political-support function" has as arguments the welfare that designated interest groups derive from the chosen policies and the deadweight loss that the policies impose on society at large. In this formulation, campaign contributions do not enter directly into the analysis (although they may be implicit in the notion of "support" by special interests), and the political competition of the next election is kept in the background. While the incumbent government maximizes support with the apparent goal of being reelected, the election

*Grossman: Woodrow Wilson School, Princeton University, Princeton, NJ 08544; Helpman: Department of Economics, Tel Aviv University, Tel Aviv 69978, Israel, and the Canadian Institute for Advanced Research. We are grateful to Robert Baldwin, Avinash Dixit, Joanne Gowa, Arye Hillman, Paul Krugman, Tom Romer, Henry Ursprung, and two anonymous referees for helpful suggestions and the National Science Foundation and the U.S.-Israel Binational Science Foundation for financial support.

itself is not explicitly considered, nor are the positions of potential rivals.

Both of these approaches contribute to our understanding of the political optimization underlying the endogenous determination of trade policy. Political competition seems most important for explaining the broader contours of trade policy: Will it be liberal or interventionist? Benefit capital or labor? Benefit the rich or the poor? At this level of generality, competing parties can articulate opposing positions and can inform (at least some) voters of the differences among them. For the finer details of policy—such as the extent to which different industries will be favored, or the designation of what sorts of instruments will be used—the political-support approach seems more appropriate. Often incumbent governments find themselves in a position to make the detailed policy choices unencumbered by immediate competition from political rivals. Of course, if the choices made by the government turn out to be ill-advised, the incumbent officeholders may be held accountable in subsequent elections.

This paper seeks to explain the equilibrium *structure of trade protection*. We are interested in understanding which special interest groups will be especially successful in capturing private benefits from the political process. We are also interested in understanding why lobbies may hold preferences over the types of policies that are used to redistribute income and why they may support institutional constraints on the set of instruments available to the government. For these purposes we adopt the perspective of the political-support approach; we model incumbent politicians who make policy choices while being aware that their decisions may affect their chances for re-election.

In developing our model of political support we take what we feel are significant steps beyond the existing literature. Previous authors have specified a reduced form for the politicians' objective function, assuming that the government places different fixed weights on the welfare levels of different groups in society. Here we derive the government's objective from more primitive

preferences defined over campaign contributions and voter well-being. While it might be argued that these preferences too have more fundamental determinants in the details of the political process, our formulation does offer a distinct advantage over more reduced-form approaches for some types of questions. One can easily imagine changes in the international rules of the game that would affect government's willingness and ability to protect particular sectoral interests but would not affect politicians' weighting of campaign contributions relative to general voter dissatisfaction. We believe that our approach could be used (in future research) to investigate how such institutional changes would affect equilibrium policies *by endogenously changing the shape of the political-support function*.

Not only do we derive the weights that the government places on different groups endogenously, but we also make explicit the process by which the government comes to pay special attention to the concerns of particular interests. Organized interest groups are able to offer political contributions, which politicians value for their potential use in the coming election (and perhaps otherwise). It is this ability to contribute (as well as the ability to deliver blocks of votes, a channel of influence that we neglect in the current paper) that gives special interests their favored position in the eyes of the government.

In our model, lobbies represent industry interests. The lobbies make (implicit) offers that relate prospective contributions to the trade policies chosen by the incumbent government. The government then sets policy—a vector of import and export taxes and subsidies—to maximize a weighted sum of aggregate social welfare and total contributions. In this process the various interest groups vie for the government's favor. The lobbies' equilibrium bids are each optimal, given the contributions promised by the others. Here, in contrast to the literature on political competition, an individual interest group does not see a link between its own (relatively small) contribution and the election outcome; rather, the groups are motivated to make contributions by the prospect

of *influencing policy*. In other words, politicians' penchant for campaign gifts makes "protection for sale."¹

We proceed to show that equilibrium trade policies obey a modified Ramsey rule: all else equal, industries with higher import demand or export supply elasticities will have smaller deviations from free trade; but the rates of protection also reflect the relative political strengths of the various interest groups and parameters describing the nation's political economy. The paper goes on to discuss the determinants of the relative sizes of the political contributions that the various interest groups must make to support the equilibrium policy choices. Finally, we examine the reasons why lobbies may prefer in some circumstances to constrain the set of policy instruments that governments can use to redistribute income.

I. Overview

We begin with an overview of our analytical approach, postponing the formal development of our model until the next section. We consider a small, competitive economy that faces exogenously given world prices. Free trade is efficient for such an economy, so any policy interventions can be ascribed to the political process. The economy produces a numeraire good, with labor alone, and each of n additional products using labor and an input that is specific to the particular sector. We assume that there is a high degree of concentration in the ownership of many of the n specific inputs and that the various owners of some of these inputs have banded together to form lobby groups. We do not at this point have a theory of lobby formation; rather we take it as given that some factor owners overcome

the free-rider problem to conduct joint lobbying activities, while others do not.

The lobby groups may offer political contributions to the incumbent officeholders, who are in a position to set the current trade policy. The lobbies do not contribute to any challenger candidates, nor do they take into account any effect of their contribution on the likelihood that the incumbents will be reelected. Although we recognize the absence of explicit political competition as a potential shortcoming of our approach, we believe that the available evidence for the United States supports our assumptions as a reasonable first approximation. In particular, political action committees (PAC's) gave more than three-quarters of their total contributions in the 1988 Congressional campaigns to incumbent candidates. If elections for open seats are excluded, incumbents received 6.3 times as much in contributions from PAC's as did their challengers (David Magelby and Candice Nelson, 1990 p. 86). Moreover, 62 percent of the campaign contributions by PAC's in the 1987–1988 campaign occurred in the first 18 months of the election cycle, often before a challenger to the incumbent had even been identified (Magelby and Nelson, 1990 p. 67). Many of these incumbents would not be involved in close races when the elections came. Also, few single contributions were large relative to total spending by any candidate. In short, PAC contributions can best be seen as attempts to curry favor.²

While the lobby groups ignore the effects of their individual contributions on the election probabilities, the incumbent politicians may see a relationship between *total* collections (which can be used to finance campaign spending) and their

¹We recognize, of course, that influence-peddling is illegal in most political systems. The policy-contingent contribution offers that we have in mind need not be explicit. Special-interest groups can readily make it known, as indeed most do, that they intend to support more generously those politicians who take positions that benefit their cause.

²Magelby and Nelson (1990 p. 55) report that, of the 255 incumbent Congress members who received the greatest portion of their funding from PAC's, only 19 took part in races where the challenger received 45 percent or more of the vote. They conclude from their review of the evidence that "PAC money is interested money" with "more than an electoral objective in mind."

reelection prospects.³ At the same time, they may believe that their odds of survival depend on the utility level achieved by the average voter. With these considerations in mind, we suppose that the incumbent politicians' objective is to maximize a weighted sum of total political contributions and aggregate social welfare. Such an objective function seems plausible for a government that is concerned about the next election, but broader interpretations also are possible. For example, aggregate welfare might enter the government's objective if some representatives are civil-minded. In addition, politicians may value contributions not only for financing future campaigns, but also for retiring debts from previous elections (which many times are owed to the politician's personal estate), for deterring competition from quality challengers,⁴ and for showing the candidates' abilities as fundraisers and thereby establishing their credibility as potential candidates for higher political or party office. In any event, politicians have, over the years, revealed their considerable taste for amassing such contributions.

We model the lobbying process as follows. Each organized interest group representing one of the sector-specific factors confronts the government with a *contribution schedule*. The schedule maps every policy vector that the government might choose (where policies are import and export taxes

and subsidies on the n nonnumeraire goods) into a campaign contribution level. Of course, some policies may evoke a contribution of zero from some lobbies. The government then sets a policy vector and collects from each lobby the contribution associated with its policy choice. An equilibrium is a set of contribution schedules such that each lobby's schedule maximizes the aggregate utility of the lobby's members, taking as given the schedules of the other lobby groups. In calculating their optimal schedules, the lobbies recognize that the politicians ultimately will set policy to maximize their own welfare. The Nash-equilibrium contribution schedules implement an equilibrium trade-policy choice.

Our model has the structure of a *common agency problem*, that is, a situation that arises when several principals attempt to induce a single agent to take an action that may be costly for the agent to perform. The government here serves as an agent for the various (and conflicting) special interest groups, while bearing a cost for implementing an inefficient policy that stems from its accountability to the general electorate. B. Douglas Bernheim and Michael D. Whinston (1986) have coined the term *menu auction* to describe a situation of complete information where bidders announce a "menu" of offers for various possible actions open to an "auctioneer" and then pay the bids associated with the action selected. They have analyzed a class of such auctions and derived several results that will prove useful below for characterizing the political equilibrium in our economy.

II. Formal Framework

A small economy is populated by individuals with identical preferences but different factor endowments. Each individual maximizes utility given by

$$(1) \quad u = x_0 + \sum_{i=1}^n u_i(x_i)$$

where x_0 is consumption of good 0 and x_i is consumption of good i , $i = 1, 2, \dots, n$. The sub-utility functions $u_i(\cdot)$ are differentiable,

³Gary C. Jacobson (1978, 1987) has argued that an incumbent's campaign spending level has little quantifiable effect on his or her chance of winning reelection. However, Donald Philip Green and Jonathan S. Krasno (1988) challenge this view, pointing out that Jacobson has either failed to control for the correlation between spending and the quality of the opponent or has used inappropriate instruments. They find a much larger influence of incumbent spending on election outcomes once challenger quality is taken into account.

⁴In their study of campaign spending in the 1978 Congressional election, Edie N. Goldenberg et al. (1986) suggest that incumbents stockpiled contributions and made early campaign expenditures in order to dissuade strong challengers from entering the race. However, Krasno and Green (1988) find little evidence of such strategic spending in their regression analysis of challenger quality.

increasing, and strictly concave. Good 0 serves as numeraire, with a world and domestic price equal to 1. We denote by p_i^* the exogenous world price of good i , while p_i represents its domestic price. With these preferences, an individual spending an amount E consumes $x_i = d_i(p_i)$ of good i , $i = 1, 2, \dots, n$ [where the demand function $d_i(\cdot)$ is the inverse of $u'_i(x_i)$] and $x_0 = E - \sum_i p_i d_i(p_i)$ of the numeraire good. Indirect utility takes the form

$$(2) \quad V(\mathbf{p}, E) = E + s(\mathbf{p})$$

where $\mathbf{p} = (p_1, p_2, \dots, p_n)$ is the vector of domestic prices of the nonnumeraire goods and $s(\mathbf{p}) \equiv \sum_i u_i[d_i(p_i)] - \sum_i p_i d_i(p_i)$ is the consumer surplus derived from these goods.

Good 0 is manufactured from labor alone with constant returns to scale and an input-output coefficient equal to 1. We assume that the aggregate supply of labor is large enough to ensure a positive supply of this good. Then the wage rate equals 1 in a competitive equilibrium. Production of each nonnumeraire good requires labor and a sector-specific input. The technologies for these goods exhibit constant returns to scale, and the various specific inputs are available in inelastic supply. With the wage rate fixed at 1, the aggregate reward to the specific factor used in producing good i depends only on the domestic price of that good. We denote this reward by $\pi_i(p_i)$.

In this paper, we restrict the set of policy instruments available to politicians. For now, we allow the government to implement only trade taxes and subsidies. These policies drive a wedge between domestic and world prices. A domestic price in excess of the world price implies an import tariff for a good that is imported and an export subsidy for one that is exported. Domestic prices below world prices correspond to import subsidies and export taxes. The net revenue from all taxes and subsidies, expressed on a per capita basis, is given by

$$(3) \quad r(\mathbf{p}) = \sum_i (p_i - p_i^*) \left[d_i(p_i) - \frac{1}{N} y_i(p_i) \right]$$

where N measures the total (voting) population and $y_i(p_i) = \pi'_i(p_i)$ is domestic output of good i . We assume that the government redistributes revenue uniformly to all of the country's voters. Then $r(\mathbf{p})$ gives the net government transfer to each individual.

A typical individual derives income from wages and government transfers, and possibly from the ownership of some sector-specific input. We assume that claims to the specific inputs are indivisible and nontradable (e.g., claims to sector-specific human capital) and that individuals own at most one type. Clearly, those who own some of the specific input used in producing good i will see their income tied to the domestic price of that good. These individuals will have a direct stake in the tax or subsidy applicable to trade in good i that goes beyond their general interest as consumers in trade policies that affect any domestic prices.

The various owners of the specific factor used in industry i , with their common interest in protection (or export subsidies) for their sector, may choose to join forces for political activity. Mancur Olson (1965) has discussed "the logic of collective action," but also the difficulties associated with overcoming free-rider problems. We have nothing to add to his discussion here, so we simply assume that in some exogenous set of sectors, denoted L , the specific-factor owners have been able to organize themselves into lobby groups. The lobbies serve to coordinate campaign giving decisions and to communicate the political "offers" to the government. In the remaining sectors (if any), the individual owners of the specific factors remain unorganized. Any individual perceives himself or herself as too small to communicate political demands effectively or to influence policy. Therefore, the unorganized factor owners, as well as all individuals who own no claims to a specific input, refrain from making political contributions.

The lobby representing an organized sector i makes its political contribution contingent on the trade-policy vector implemented by the government. Since the country is small, it can equivalently relate the gift to the realized vector of domestic prices. We denote by $C_i(\mathbf{p})$ the contribution

schedule tendered by lobby i . The lobby tailors this schedule to maximize the total welfare (income plus consumer surplus less contributions) of its members. It then collects the necessary donations from its members in such a way as to allow all to share in the gains from political coordination.

It will prove convenient in what follows to express the joint welfare of the members of lobby group i as $V_i = W_i - C_i$, where W_i is their gross-of-contributions joint welfare. We note that

$$(4) \quad W_i(\mathbf{p}) \equiv \ell_i + \pi_i(p_i) + \alpha_i N[r(\mathbf{p}) + s(\mathbf{p})]$$

where ℓ_i is the total labor supply (and also the labor income) of owners of the specific input used in industry i and α_i is the fraction of the voting population that owns some of this factor.

The incumbent government cares about the total level of political contributions and about aggregate well-being. The government values contributions, because they can be used to finance campaign spending, and as noted above, they may provide other direct benefits to the officeholders. Social welfare will be of concern to the incumbent government if voters are more likely to reelect a government that has delivered a high standard of living. We choose a linear form for the government's objective function, namely,

$$(5) \quad G = \sum_{i \in L} C_i(\mathbf{p}) + aW(\mathbf{p}) \quad a \geq 0$$

where W represents aggregate, gross-of-contributions welfare.⁵ Aggregate gross wel-

fare equals aggregate income plus trade tax revenues plus total consumer surplus; that is,

$$(6) \quad W(\mathbf{p}) = \ell + \sum_{i=1}^n \pi_i(p_i) + N[r(\mathbf{p}) + s(\mathbf{p})].$$

We are interested in the political equilibrium of a two-stage noncooperative game in which the lobbies simultaneously choose their political contribution schedules in the first stage and the government sets policy in the second. An equilibrium is a set of contribution functions $\{C_i^o(\mathbf{p})\}$, one for each organized lobby group, such that each one maximizes the joint welfare of the group's members given the schedules set by the other groups and the anticipated political optimization by the government; and a domestic price vector \mathbf{p}^o that maximizes the government's objective taking the contribution schedules as given. We characterize the equilibrium structure of protection in the next section and the political contributions that underlie the government's policy choice in the section that follows.

III. The Structure of Protection

As we noted near the end of Section II, the interaction between the various lobbies and the government in this economy has the structure of a menu-auction problem. Bernheim and Whinston (1986) have characterized the equilibrium for a class of such problems. Although they limited their analysis to situations where players bid for a finite set of objects, it is clear that their main results apply also when, as here, the auctioneer can choose from a continuum of possible actions. Accordingly, we allow the government's choice set (of domestic price vectors) to be continuous.

Let \mathcal{P} denote the set of domestic price vectors from which the government may choose. We bound \mathcal{P} so that each domestic price p_i must lie between some minimum \underline{p}_i and some maximum \bar{p}_i . For the most part, we restrict attention to equilibria that lie in

⁵We could equally well write the government's welfare function as $\tilde{G} = a_1 \sum_{i \in L} C_i + a_2 (W_i - \sum_{i \in L} C_i)$, where a_1 is the weight the government attaches to campaign contributions and a_2 is the weight it attaches to net aggregate welfare. Maximizing \tilde{G} is equivalent to maximizing G in (5) with $a = a_2 / (a_1 - a_2)$, provided that $a_1 > a_2$. We assume that this is so (i.e., that politicians value a dollar in their campaign coffers more highly than a dollar in the hands of the public). This assumption implies no restriction on the size of the parameter a .

the interior of \mathcal{P} . Lemma 2 of Bernheim and Whinston (1986) implies that an equilibrium to the trade-policy game can be characterized as follows:

PROPOSITION 1 (B-W): $(\{C_i^o\}_{i \in L}, \mathbf{p}^o)$ is a subgame-perfect Nash equilibrium of the trade-policy game if and only if:

- (a) C_i^o is feasible for all $i \in L$;
- (b) \mathbf{p}^o maximizes $\sum_{i \in L} C_i^o(\mathbf{p}) + aW(\mathbf{p})$ on \mathcal{P} ;
- (c) \mathbf{p}^o maximizes

$$W_j(\mathbf{p}) - C_j^o(\mathbf{p}) + \sum_{i \in L} C_i^o(\mathbf{p}) + aW(\mathbf{p})$$

on \mathcal{P} for every $j \in L$;

- (d) for every $j \in L$ there exists a $\mathbf{p}^j \in \mathcal{P}$ that maximizes $\sum_{i \in L} C_i^o(\mathbf{p}) + aW(\mathbf{p})$ on \mathcal{P} such that $C_j^o(\mathbf{p}^j) = 0$.

Condition (a) restricts each lobby's contribution schedule to be among those that are feasible (i.e., contributions must be nonnegative and no greater than the aggregate income available to the lobby's members). Condition (b) states that, given the contribution schedules offered by the lobbies, the government sets trade policy to maximize its own welfare. The last two conditions allow us to characterize the equilibrium structure of protection and the equilibrium pattern of political contributions, respectively. We derive and apply condition (c) here, while postponing discussion of condition (d) until the next section.

Condition (c) stipulates that, for every lobby j , the equilibrium price vector must maximize the joint welfare of that lobby and the government, given the contribution schedules offered by the other lobbies. If this were not the case, then lobby j could reformulate its policy bids to induce the government to choose the jointly optimal price vector and could appropriate some (in fact, nearly all) of the surplus from the switch in policy. Suppose, for example, that the government contemplated choosing the price vector $\tilde{\mathbf{p}}$, whereas $\hat{\mathbf{p}}$ is jointly optimal for lobby j and the government. All lobby j need do is design a new contribution schedule that pays the government for any price

vector \mathbf{p} the difference between its welfare at $\tilde{\mathbf{p}}$ and its welfare at \mathbf{p} , plus a little bit more for choosing \mathbf{p} . The "little bit more" would vary with \mathbf{p} and would be maximal for $\mathbf{p} = \hat{\mathbf{p}}$. Then the government would gain by choosing $\hat{\mathbf{p}}$ in place of $\tilde{\mathbf{p}}$, and would prefer $\hat{\mathbf{p}}$ to any other policy choice. The government's gain would be small, however, and the lobby would capture nearly all of the surplus.⁶ In equilibrium, no such unexploited profit opportunities can exist for any lobby.

Let us assume now that the lobbies set political-contribution functions that are differentiable, at least around the equilibrium point \mathbf{p}^o . In a moment we will argue that there are some compelling reasons for focusing on contribution schedules that have this property. With contribution functions that are differentiable, the fact that \mathbf{p}^o maximizes $V_j + G$ implies that a first-order condition is satisfied at \mathbf{p}^o , namely,

$$(7) \quad \nabla W_j^o(\mathbf{p}^o) - \nabla C_j^o(\mathbf{p}^o) + \sum_{i \in L} \nabla C_i^o(\mathbf{p}^o) + a \nabla W(\mathbf{p}^o) = 0 \quad \text{for all } j \in L.$$

However, the government's maximization of G requires the first-order condition

$$(8) \quad \sum_{i \in L} \nabla C_i^o(\mathbf{p}^o) + a \nabla W(\mathbf{p}^o) = 0.$$

Taken together, (7) and (8) imply

$$(9) \quad \nabla C_i^o(\mathbf{p}^o) = \nabla W_i(\mathbf{p}^o) \quad \text{for all } i \in L.$$

Equation (9) establishes that the contribution schedules all are *locally truthful* around \mathbf{p}^o ; that is, each lobby sets its contri-

⁶More formally, let $\tilde{C}_i(\mathbf{p})$ be the contemplated bid schedules for the lobbies $i \in L$. Suppose they induce the government to choose $\tilde{\mathbf{p}}$, but $\hat{\mathbf{p}} \neq \tilde{\mathbf{p}}$ maximizes $V_j + G$, given $\{\tilde{C}_i(\mathbf{p})\}$ for $i \neq j$. Now let lobby j reformulate its contribution schedule as $\hat{C}_j(\mathbf{p}) \equiv \sum_{i \in L} \tilde{C}_i(\hat{\mathbf{p}}) + aW(\hat{\mathbf{p}}) - \sum_{i \in L, i \neq j} \tilde{C}_i(\mathbf{p}) - aW(\mathbf{p}) + \varepsilon h(\mathbf{p})$, where $h(\cdot)$ is any nonnegative function that reaches a unique maximum at $\mathbf{p} = \hat{\mathbf{p}}$. Faced with this new schedule in place of $\tilde{C}_j(\mathbf{p})$, the government maximizes G by choosing the policy vector $\hat{\mathbf{p}}$ as long as $\varepsilon > 0$. Lobby j 's welfare becomes $W_j(\hat{\mathbf{p}}) - \hat{C}_j(\hat{\mathbf{p}}) = W_j(\hat{\mathbf{p}}) - \tilde{C}_j(\hat{\mathbf{p}}) + \Delta - \varepsilon h(\hat{\mathbf{p}})$, where $\Delta > 0$ represents the gain in joint welfare $V_j + G$ that results from replacing $\tilde{\mathbf{p}}$ with $\hat{\mathbf{p}}$. For ε small enough, we have $\Delta > \varepsilon h(\hat{\mathbf{p}})$, which implies $W_j(\hat{\mathbf{p}}) - \hat{C}_j(\hat{\mathbf{p}}) > W_j(\tilde{\mathbf{p}}) - \tilde{C}_j(\tilde{\mathbf{p}})$ (i.e., the lobby gains from this change in its contribution schedule).

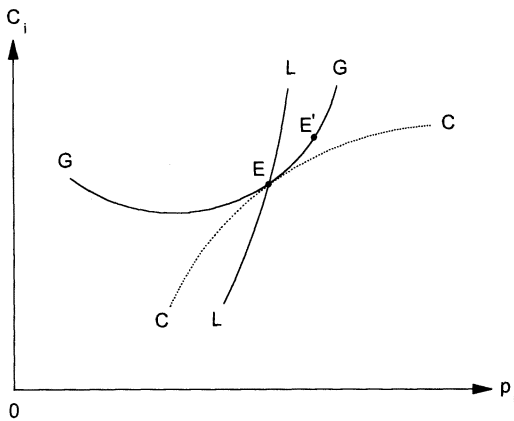


FIGURE 1. LOCAL TRUTHFULNESS

bution schedule so that the marginal change in the contribution for a small change in policy matches the effect of the policy change on the lobby's gross welfare. In other words, the shapes of the schedules reveal the lobbies' true preferences in the neighborhood of the equilibrium. The intuition for this result can be seen in Figure 1, where we plot the contribution C_i made by lobby i along the vertical axis and the domestic price p_i along the horizontal axis. The curve labeled GG is an indifference curve for the government. It shows the contributions from lobby i that would compensate the government for altering the price of good i , in view of the change in aggregate welfare and the change in contributions from all other lobbies that would result from the price change. The curve labeled LL depicts an indifference curve for lobby i . These curves must be upward-sloping in the neighborhood of the equilibrium, although this fact is not needed for the present argument. Now suppose that the lobby offers the contribution schedule CC, inducing the government to maximize its welfare at point E. Since CC is not tangent to LL at E, there exists a point E' along GG that yields greater welfare to lobby i than point E. The lobby could induce the government to choose E' instead of E by offering a contribution schedule that coincides with CC until a point somewhere below point E, falls below CC at that point and then rises to be tangent with

GG at E'. It will always be possible for the lobby to reconfigure its contribution schedule like this so as to raise its net welfare, unless CC and LL are tangent to one another (and to GG) at the equilibrium point.

We can extend this notion of "truthfulness" to define (as Bernheim and Whinston [1986] do) a *truthful contribution schedule*. This is a contribution schedule that *everywhere* reflects the true preferences of the lobby. It pays to the government for any policy \mathbf{p} the excess (if any) of lobby j 's gross welfare at \mathbf{p} relative to some base level of welfare. Formally, a truthful contribution function takes the form

$$(10) \quad C_j^T(\mathbf{p}, B_j) = \max[0, W_j(\mathbf{p}) - B_j]$$

for some B_j . Notice that truthful schedules are differentiable, except possibly where the contribution becomes nil, because the gross benefit functions are differentiable. Bernheim and Whinston (1986) have shown that players bear essentially no cost from playing truthful strategies, because the set of best responses to *any* strategies played by one's opponents includes a strategy that is truthful. They have also shown that all equilibria supported by truthful strategies, and only these equilibria, are stable to non-binding communication among the players (i.e., they are "coalition-proof"). For these reasons they argue that *truthful Nash equilibria* (those equilibria supported by truthful bid functions) may be focal among the set of Nash equilibria.

Truthful Nash equilibria (TNE) have an interesting property. The equilibrium price vector of any TNE satisfies⁷

$$(11) \quad \mathbf{p}^0 = \arg \max_{\mathbf{p} \in \mathcal{P}} \left[\sum_{j \in L} W_j(\mathbf{p}) + aW(\mathbf{p}) \right].$$

⁷To see this, note that condition (b) of Proposition 1 implies that $\sum_{j \in L} C_j^0(\mathbf{p}^0) + aW(\mathbf{p}^0) \geq \sum_{j \in L} C_j^0(\mathbf{p}) + aW(\mathbf{p})$ for all $\mathbf{p} \in \mathcal{P}$. If the contribution functions are truthful, then from the definition (10), $C_j^0(\mathbf{p}^0) = W_j(\mathbf{p}^0) - B_j^0$ (where B_j^0 is the equilibrium net benefit to lobby j) and $C_j^0(\mathbf{p}) \geq W_j(\mathbf{p}) - B_j^0$ for all $j \in L$ and all $\mathbf{p} \in \mathcal{P}$. Therefore $\sum_{j \in L} W_j(\mathbf{p}^0) + aW(\mathbf{p}^0) \geq \sum_{j \in L} W_j(\mathbf{p}) + aW(\mathbf{p})$ for all $\mathbf{p} \in \mathcal{P}$.

Equation (11) says that, in equilibrium, truthful contribution schedules induce the government to behave as if it were maximizing a social-welfare function that weights different members of society differently, with individuals represented by a lobby group receiving a weight of $1 + a$ and those not so represented receiving the smaller weight of a . Our model thus provides microanalytic foundations for the reduced-form political-support function used by, for example, Ngo Van Long and Neil Voudsen (1991).

We return now to the characterization of equilibrium trade policies that can be supported by differentiable—although not necessarily globally truthful—contribution schedules.⁸ We sum (9) over i and substitute the result into (8) to derive

$$(12) \quad \sum_{i \in L} \nabla W_i(\mathbf{p}^0) + a \nabla W(\mathbf{p}^0) = 0.$$

This equation characterizes the equilibrium domestic prices supported by differentiable contribution functions. Notice that this is just the first-order condition that is necessary for the maximization in (11), although we see that it must hold more generally (i.e., for all differentiable contribution schedules, not just those that are everywhere truthful).

Our next step is to calculate how marginal policy changes affect the welfare of the various groups in society. Looking first at the members of some lobby i we find from (3) and (4) that

$$(13) \quad \frac{\partial W_i}{\partial p_j} = (\delta_{ij} - \alpha_i) y_j(p_j) + \alpha_i(p_j - p_j^*) m'_j(p_j)$$

where $m_j(p_j) \equiv Nd_j(p_j) - y_j(p_j)$ denotes the

net import demand function and δ_{ij} is an indicator variable that equals 1 if $i = j$ and 0 otherwise. Equation (13) states that lobby i gains from an increase in the domestic price of good i above its free-trade level and gains from a decrease in the price of any other good (because $m'_j < 0$). The specific-factor owners benefit more from an increase in the price of their industry's output the larger is the free-trade supply of the good. The benefit to lobby i that results from a decline in the price of another good j falls as the share of the members of lobby i in the total population shrinks, and it vanishes completely in the limit when $\alpha_i = 0$. When the members of lobby i are a negligible fraction of the total population, they receive only a negligible share of the transfers generated by taxes on good j , and they enjoy only a negligible share of the surplus that derives from consumption of good j . In this case, they are unaffected by changes in the domestic price of that good.

Since all organized interest groups submit locally truthful contribution schedules, we need to know how a policy change impinges on the gross welfare of the entire group of individuals who are actively trying to influence policy. Accordingly, we sum the expressions in (13) for all $i \in L$ to derive

$$(14) \quad \sum_{i \in L} \frac{\partial W_i}{\partial p_j} = (I_j - \alpha_L) y_j(p_j) + \alpha_L(p_j - p_j^*) m'_j(p_j)$$

where $I_j \equiv \sum_{i \in L} \delta_{ij}$ is an indicator variable that equals 1 if industry j is organized and 0 otherwise, while $\alpha_L \equiv \sum_{i \in L} \alpha_i$ denotes the fraction of the total population of voters who are represented by a lobby. Equation (14) reveals that, starting from free-trade prices, lobby members as a whole benefit from a small increase in the domestic price of any good that is produced by an organized industry and (provided $\alpha_L > 0$) from a small decline in the price of any good that is produced by an unorganized industry.

Finally, we compute the effect of a marginal price change on aggregate welfare.

⁸Even if one does not accept the Bernheim-Whinston argument for TNE, one might want to require that contribution schedules be differentiable, because these schedules will be robust to small mistakes in calculation on the part of the lobbies, whereas a lobby might suffer a large penalty for a small miscalculation if it used a nondifferentiable payment schedule.

Using the definition of W in (6), we find

$$(15) \quad \frac{\partial W}{\partial p_j} = (p_j - p_j^*) m'_j(p_j)$$

which reveals, of course, that marginal deadweight loss grows as the economy deviates further and further from free trade. Substituting (14) and (15) into (12) allows us to solve for the domestic prices in political equilibrium, assuming that these prices lie in the interior of \mathcal{P} .⁹ We express the result in terms of the equilibrium ad valorem trade taxes and subsidies, which are defined by $t_i^o \equiv (p_i^o - p_i^*)/p_i^*$.

PROPOSITION 2 (Equilibrium Policies): *If the lobbies use contribution schedules that are differentiable around the equilibrium point, and if the equilibrium lies in the interior of \mathcal{P} , then the government chooses trade taxes and subsidies that satisfy*

$$\frac{t_i^o}{1+t_i^o} = \frac{I_i - \alpha_L}{a + \alpha_L} \left(\frac{z_i^o}{e_i^o} \right) \quad \text{for } i = 1, 2, \dots, n$$

where $z_i^o = y_i(p_i^o)/m_i(p_i^o)$ is the equilibrium ratio of domestic output to imports (negative for exports) and $e_i^o = -m'_i(p_i^o)p_i^o/m_i(p_i^o)$ is the elasticity of import demand or of export supply (the former defined to be positive, the latter negative).

Proposition 2 describes a modified Ramsey rule. All else equal, industries that have

⁹The domestic price of good i may be driven to the boundary of \mathcal{P} if one of several constraints becomes binding. First, the owners of the specific factor used in industry i may not have sufficient resources to "protect themselves" from other lobbies (i.e., the political contributions needed to keep p_i above \bar{p}_i may exceed their aggregate income). Second, some lobby group j may bid for such a large export subsidy that the income of some individuals will not be sufficient to cover the per capita levy needed to finance the subsidy. Then p_j will be driven to \bar{p}_j . These extreme outcomes, which are made possible by the linearity in our specification, are not an especially interesting feature of the model. Thus, we do not pursue the equilibria with corner solutions any further.

high import demand or export supply elasticities (in absolute value) will have smaller ad valorem deviations from free trade. This is true for two reasons. First, the government may bear a political cost from creating deadweight loss (if $a > 0$). To the extent that this is so, all else equal, it will prefer to raise contributions from sectors where the cost is small. Second, even if $a = 0$, if $\alpha_L > 0$ the members of lobbies as a group will share in any deadweight loss that results from trade policy. The owners of specific inputs in industries other than i will bid more to avoid protection in sector i the greater is the social cost of that protection.

Considerations of deadweight loss are modified by political variables in the determination of the equilibrium structure of protection. First, note that *all* sectors that are represented by lobbies are protected by import tariffs or export subsidies in the political equilibrium.¹⁰ In contrast, import subsidies and export taxes are applied to all sectors that have no organized representation. In other words, the organized interest groups collectively manage to raise the domestic prices of goods from which they derive profit income and to lower the prices of goods that they only consume. The political power of a particular organized sector is reflected by the ratio of domestic output to imports. In sectors with a large domestic output, the specific-factor owners have much to gain from an increase in the domestic price, while (for a given import demand elasticity) the economy has relatively little to lose from protection when the volume of imports is low.¹¹

¹⁰The formula for the equilibrium trade tax can be expressed as

$$t_i^o = \frac{I_i - \alpha_L}{a + \alpha_L} \left(\frac{y_i(p_i^o)}{[-p_i^* m'_i(p_i^o)]} \right).$$

If this equation has a solution for a case where $I_i = 1$, then it must involve $t_i^o > 0$. If the equation has no solution, then $p_i^o = \bar{p}_i$, and again $t_i^o > 0$.

¹¹Our formula suggests that only two variables (the elasticity of import demand and the ratio of domestic output to imports) should explain the cross-industry

The smaller is the weight that the government places on a dollar of aggregate welfare compared with a dollar of campaign financing, the larger in absolute value are all trade taxes and subsidies. An interior solution remains possible, however, even if the government cares only about contributions ($a = 0$). This is because the interest groups themselves do not want the distortions to grow too large. As the share of voters who are members of one interest group or another increases, equilibrium rates of protection for the organized industries decline. At the extreme, when all voters belong to an interest group ($\alpha_L = 1$) and all sectors are represented ($I_i = 1$ for all i), then free trade prevails in all markets. In this case, the various interest groups neutralize one another, so that an industry's demand for protection is matched in equilibrium by the opposing interest groups' bids for a low domestic price. On the other hand, if interest-group members comprise a negligible fraction of the voting population ($\alpha_L = 0$), then no trade taxes or subsidies will be applied to goods not represented by a lobby (for which $I_i = 0$). When the potential political contributors are few in number, they stand little to gain from trade interventions in sectors other than their own.

IV. Political Contributions

We have characterized the structure of protection that emerges from the political process whenever the interest groups use contribution schedules that are locally differentiable. This restriction on the contribution functions leaves latitude for schedules with many different shapes (away from equi-

librium), and in fact the set of contribution schedules that supports the equilibrium policy vector is not unique. Different sets of equilibrium contribution schedules give rise to different equilibrium donations by the various lobby groups and thus to different net payoffs for the groups' members. If we are to say something more about which lobbies contribute the most to influence policy, we must introduce additional assumptions that allow us to select among the set of Nash equilibria.

We focus henceforth on truthful Nash equilibria; recall that these are equilibria that arise when lobbies announce truthful contribution schedules. With this restriction on the nature of the policy bids the competition between the lobbies involves only a choice of the scalars $\{B_i\}$. Given these "anchors" for the contribution functions, the truthfulness requirement dictates the shapes of the schedules [see the definition in (10)].

What incentive does a lobby i face with regard to its choice of B_i ? From the definition of a truthful contribution schedule, we see that the net welfare to lobby i will be B_i whenever the lobby makes a positive contribution to the government in equilibrium. The lobby therefore wishes to make B_i as large as possible (and the contribution as small as possible), but without going so far as to induce the government to deviate from \mathbf{p}^0 to some alternative policy that might be damaging to its interests.

This point can be made clear with an example. Suppose for the moment that there are exactly two lobbies and that the government cares only about campaign financing ($a = 0$). Let the lobbies contemplate setting the anchors \hat{B}_1 and \hat{B}_2 for their truthful contribution schedules. With these anchors the lobbies' contributions will be $C_1^T(\mathbf{p}, \hat{B}_1)$ and $C_2^T(\mathbf{p}, \hat{B}_2)$, which depend of course on the policy action taken by the government. In Figure 2, the shaded area represents the set of contribution pairs (C_1, C_2) that the government might collect for all of the various policy choices open to it. Given this shaded opportunity set, a government that cares only about maximizing total contribu-

variation in protection levels. Empirical studies of the structure of protection are reviewed by Robert E. Baldwin (1984) and Kym Anderson and Baldwin (1987). However, the existing studies fail to control for import demand elasticities, while including many variables that are not indicated by our model (but which may be correlated with the omitted variable), thus rendering the regression results impossible to interpret in the light of our theory.

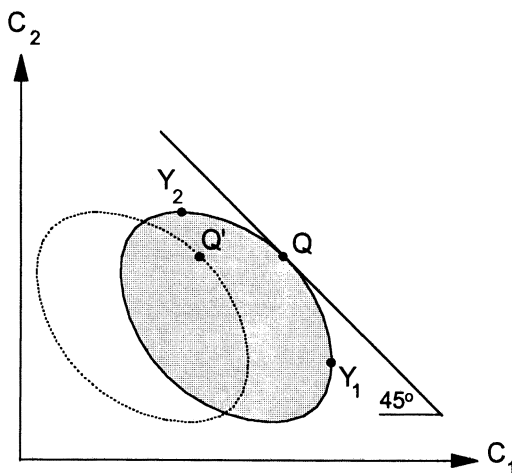


FIGURE 2. EXCESSIVE CONTRIBUTIONS

tions will opt for point Q , where the outer frontier is tangent to a line with a slope of -1 . Underlying this point is some policy vector. If the figure is to represent an equilibrium situation, it must be the policy identified in Proposition 2.

Now we examine whether lobby 1 might wish to raise B_1 slightly above \hat{B}_1 . By doing so, it would reduce all of its contributions *by the same amount*. The shaded area would shift uniformly to the left, to the location indicated by the dotted lines. The government would then be faced with a new set of possibilities and would choose the point Q' , a leftward displacement of point Q . But the policy underlying point Q' must be the same as that for point Q , since the relative desirability of different policies has not changed from the government's (political) perspective. Evidently, lobby 1 must benefit from this increase in B_1 . Of course, the situation illustrated in the figure affords lobby 2 the same opportunity to improve its net welfare; so Figure 2 cannot represent an equilibrium situation.

The lobbies will continue to see an incentive to raise their B_i 's at least as long as the contributions associated with the entire set of feasible policies remain positive. But eventually, when B_i gets sufficiently large, some policies will elicit a contribution of

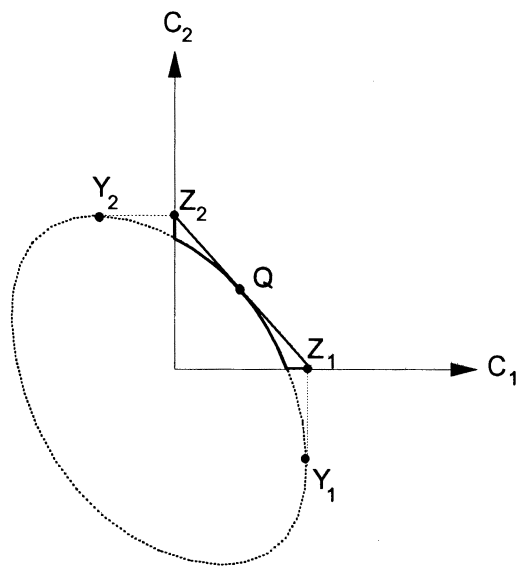


FIGURE 3. EQUILIBRIUM CONTRIBUTIONS

zero from lobby i [again see (10)]. Subsequent increases in B_i no longer affect the government's choices uniformly; the positive reward associated with a policy that is favorable to lobby i is reduced by an increase in B_i , but the nil contribution corresponding to a policy that is unfavorable to lobby i does not change. Lobby i must be careful not to raise B_i so far that the government decides to adopt one of these disadvantageous policies.

Figure 3 depicts an equilibrium configuration. Here both lobbies have increased their B_i 's (relative to the situation depicted in Fig. 2), so that some policy choices available to the government generate a contribution of zero from one or the other of the lobbies. Consider, for example, the point Y_1 , which corresponds to the similarly labeled point in Figure 2. This point is not feasible now, because lobby 2 cannot offer a negative contribution as implied. Rather, if the government were to choose the policy underlying this point (which, incidentally, is the policy most preferred by lobby 1) it would receive the pair of contributions at Z_1 : a large donation from a thankful lobby 1 and a nil contribution from lobby 2. In

Figure 3, the government collects the same total donations for choosing any one of Q , Z_1 , and Z_2 . No other point offers contributions as great as these, so the policies that underlie these three points comprise the set of welfare-maximizing choices for the government. The government willingly chooses point Q ; and neither lobby wishes to raise its B_i any further, for fear that the government then would select the policy most preferred by its rival.

Notice that our equilibrium conforms to condition (d) of Proposition 1. That condition requires that for every i there must exist a policy that elicits a contribution of zero from lobby i which the government finds equally attractive as the equilibrium policy \mathbf{p}^0 . In the figure, these policies are, for lobbies 1 and 2, the ones that underlie points Z_2 and Z_1 , respectively.

In our 1992a working paper we present a formal procedure for calculating the equilibrium contributions and net welfare levels when an arbitrary number of lobbies set truthful contribution schedules and the government has the more general objective function described in (5). Here we will present the procedure informally, relying on the intuition developed for the special case just discussed. Then we will calculate the contributions for several examples, showing in the process how the political environment determines the division of surplus between the interest groups and the politicians.

Our special case suggests that each lobby must worry about what policy would be chosen if it were to raise its B_i to a level where the government would opt to neglect its interests entirely. We define \mathbf{p}^{-i} as the policy that would emerge from political maximization by the government, if the contribution offered by lobby i were zero; that is,

$$(16) \quad \mathbf{p}^{-i} = \arg \max_{\mathbf{p} \in \mathcal{P}} \sum_{\substack{j \in L \\ j \neq i}} C_j^T(\mathbf{p}, B_j^0) + aW(\mathbf{p})$$

for $i \in L$.

We have seen in the example that lobby i

will raise its B_i to the point where the government is just indifferent between choosing the policy \mathbf{p}^{-i} and choosing the equilibrium policy \mathbf{p}^0 . The following equation expresses this indifference:

$$(17) \quad \sum_{\substack{j \in L \\ j \neq i}} C_j^T(\mathbf{p}^{-i}, B_j^0) + aW(\mathbf{p}^{-i}) \\ = \sum_{j \in L} C_j^T(\mathbf{p}^0, B_j^0) + aW(\mathbf{p}^0)$$

for all $i \in L$.

These two sets of equations allow us to solve for the net welfare levels of the various lobbies in a truthful Nash equilibrium (TNE) with positive contributions by all lobbies. As a consistency check, we must make sure that at B_i^0 , lobby i would make no contribution were the policy \mathbf{p}^{-i} to be chosen by the government. This requires $W_i(\mathbf{p}^{-i}) \leq B_i^0$ for all $i \in L$. If this inequality fails for some i , then that lobby benefits from raising its B_i (reducing its equilibrium contributions) until the constraint that payments must be nonnegative becomes binding. Such a lobby would contribute nothing in the political equilibrium, and the equilibrium policy would be the same as if the factor owners represented by this lobby were politically unorganized.

We now examine three special cases, to see how the equilibrium contributions are determined in different situations.

Example 1: A Single Organized Lobby.—Suppose that there is only one politically active lobby group, which represents the interests of the specific-factor owners in some industry i . The equilibrium policy vector in this case provides protection for sector i ($p_i^0 > p_i^*$), and so long as $\alpha_i > 0$, it calls for import subsidies and export taxes on all other goods ($p_j^0 < p_j^*$ for $j \neq i$). We know that the government would opt for free trade in the absence of any contributions from the one and only special-interest group; thus (16) gives $\mathbf{p}^{-i} = \mathbf{p}^*$. Using (17),

we find the equilibrium campaign contribution of lobby i , $C_i^T(\mathbf{p}^0, B_i^0) = aW(\mathbf{p}^*) - aW(\mathbf{p}^0)$. We see that the lobby contributes an amount that is proportional to the excess burden that the equilibrium trade policies impose on society. The factor of proportionality is the weight that the government attaches to aggregate gross welfare (relative to campaign contributions) in its own objective function. In this political equilibrium, the politicians derive exactly the same utility as they would have achieved by allowing free trade in a world without influence payments. In other words, *a lobby that faces no opposition from competing interests captures all of the surplus from its political relationship with the government.*

Example 2: All Voters Represented as Special Interests.—The next example is one in which all of the voters are represented in the political process by one lobby group or another. We have seen that the political competition in this case results in free trade ($\mathbf{p}^0 = \mathbf{p}^*$). Nonetheless, each lobby must make a positive campaign contribution in order to induce the government to choose this outcome rather than one that would be still worse from its perspective. Take for example the case where there are only two nonnumeraire goods and two lobbies. Using (17), we have

$$(18) \quad C_i^T(\mathbf{p}^0, B_i^0) = [C_j^T(\mathbf{p}^{-i}, B_j^0) + aW(\mathbf{p}^{-i})] \\ - [C_j^T(\mathbf{p}^0, B_j^0) + aW(\mathbf{p}^0)] \\ \text{for } i = 1, 2; j \neq i.$$

By the definition of \mathbf{p}^{-i} and the fact that $\mathbf{p}^{-i} \neq \mathbf{p}^* = \mathbf{p}^0$, we know that the right-hand side of (18) is positive for $i = 1, 2$. Thus, both lobbies must actively contribute to the incumbent government in order to support the free-trade outcome. *When all voters are active in the process of buying influence, the rivalry among competing interests is most intense, and the government captures all of the surplus from the political relationships.*

Which of the two lobbies makes the larger contribution? To answer this question, we

rewrite equation (18) as¹²

$$(19) \quad C_i^T(\mathbf{p}^0, B_i^0) = [W_j(\mathbf{p}^{-i}) + aW(\mathbf{p}^{-i})] \\ - [W_j(\mathbf{p}^*) + aW(\mathbf{p}^*)] \\ \text{for } i = 1, 2; j \neq i.$$

This equation says that each lobby i must contribute to the politicians an amount equal to the difference between what its rival and the government could jointly achieve were lobby i not itself active in the political process and what the two actually attain in the full political equilibrium. Thus, *each lobby pays according to the political strength of its rival.* Take for example the case in which the industries are symmetric except that they have different, perfectly inelastic supply functions $y_i(\mathbf{p}) = \bar{y}_i$. Then the interest group representing factor owners with the smaller endowment makes the larger political contribution.

Example 3: Represented Special Interests Are Highly Concentrated.—The final example is one where the ownership of the specific factors is so highly concentrated that interest-group members account for a negligible fraction of the total voting population. The political equilibrium in this case has positive protection for all organized sectors. But since $\alpha_i = 0$ for all i , the members of each interest group receive only a negligible share of government transfer payments and derive only a negligible share of the surplus from consuming nonnumeraire products. Thus, no lobby is willing to contribute toward trade intervention in any sector other than its own. The policy \mathbf{p}^{-i} that the government would choose if lobby i failed to contribute allows free trade in good i (since

¹²In order to do so, we need $C_j^T(\mathbf{p}^{-i}, B_j^0) - C_j^T(\mathbf{p}^*, B_j^0) = W_j(\mathbf{p}^{-i}) - W_j(\mathbf{p}^*)$. Given that the contribution schedules are truthful, this will be the case if both $C_j^T(\mathbf{p}^{-i}, B_j^0)$ and $C_j^T(\mathbf{p}^*, B_j^0)$ are positive. We have already seen that the latter is true. Since the right-hand side of (18) is positive and $W(\mathbf{p}^{-i}) < W(\mathbf{p}^*)$, we have $C_j^T(\mathbf{p}^{-i}, B_j^0) > C_j^T(\mathbf{p}^*, B_j^0)$. Thus, the former must be true as well.

this policy is socially efficient and no other lobby bids for any intervention) but has the same protection on all other goods as in the full equilibrium (since the presence or absence of lobby i has no bearing on the political interaction between the government and those with interests in these other sectors). The common agency problem here is the same as for a set of separate principal-agent arrangements between each industry lobby and the government. As in Example 1, each lobby i must compensate the government for the political cost of providing protection (it pays a times the deadweight loss imposed by the industry policy p_i^0). *But with no political rivalry between the special interests, each industry group captures all of the surplus from its own political relationship with the government.*¹³

V. Why Lobbies May Prefer Trade Policies

In deriving the political-economic equilibrium, we have limited the government's choice of policy instruments to trade taxes and subsidies. It may seem that the interest groups would prefer to have the government use more efficient means to transfer income. Our model implies that this is not necessarily the case. In fact, the lobby groups may support institutions that constrain the government to transfer income as inefficiently as possible. Accordingly, a regime that allows only voluntary export restraints (with quota rents transferred to foreigners) may be even more desirable to the lobbies than one that allows for import tariffs. We will discuss now why this is so.¹⁴

Suppose that the government could use output subsidies instead of (or in addition

to) trade policies to transfer income to groups that bid for special treatment. It is well known that such subsidies generate less deadweight loss than tariffs and export subsidies, for an equivalent amount of income transfer. But would the interest groups share in these efficiency gains?

Consider first the case where factor ownership is highly concentrated, so that the members of the lobby groups account for a negligible fraction of the total population. In this case the interests of the industry lobbies are not directly opposed. As we have seen, no lobby would bid against policies that favored other interest groups under these circumstances. The equilibrium output subsidies would be the ones that maximized the joint welfare of each lobby and the government. Of course, joint welfare is higher in a regime that allows output subsidies than in one that does not, because the output subsidies generate less deadweight loss than the trade policies. Moreover, each lobby compensates the government only for the political cost associated with its special treatment (an amount a times the deadweight loss). Therefore, the lobbies capture *all* of the surplus from the use of the more efficient policy instrument.

However, consider now the case where all voters are represented by an organized lobby group. In this situation, as we have seen, the political competition among the groups is quite intense. We know that the equilibrium policy in any TNE maximizes a weighted sum of the utilities of represented and unrepresented voters, and that when all voters are represented in the bidding process the equilibrium policy maximizes aggregate welfare. So the equilibrium entails *laissez-faire*, just as free trade emerged as the political equilibrium when the government could invoke only trade policies. However, the lobbies must make larger political contributions to induce the *laissez-faire* outcome in the equilibrium with output subsidies than they must make to support a free-trade outcome in the regime that allows only trade interventions. This is because each lobby must contribute in equilibrium the difference between what rival lobbies and the government could jointly achieve in the ab-

¹³The interested reader can refer to our 1992a working paper for further details.

¹⁴Our point is related to, but not the same as, one made by Dani Rodrik (1986) and John D. Wilson (1990). These two have argued that a policy regime with tariffs only may be socially preferred to one with output subsidies, because the distortions that endogenously emerge in the former regime may be smaller than those in the latter. Our arguments concern the institutional preferences of special-interest groups, not those of an external observer.

sence of its own participation in the political process and what they in fact achieve in the political equilibrium. The equilibrium entails the same joint welfare under either regime; but the rival lobbies and the government can jointly attain greater welfare in a policy regime that allows output subsidies (or other, more efficient policies) than in one that does not. It follows that the lobbies' contributions will be higher and net welfare lower if the political regime allows output subsidies.

These examples suggest that the extent of competition between rival interest groups determines their preferences among alternative policy regimes. When competition between interest groups is intense (because their interests are in direct opposition), the availability of an efficient income-transfer tool makes credible an implicit government threat to join forces with the opposing lobbies. Individual interest groups have little political power under these conditions, and they prefer to tie the hands of the government. However, when the interests of the lobbies are orthogonal to one another, the groups do not compete for favors, but instead seek to extract gains at the expense of the underrepresented masses. Then each lobby prefers to grant politicians access to the most efficient means possible for transferring income.

VI. Summary and Extensions

We have developed a new approach to analyzing the formation of trade policy in a representative democracy. Like many previous authors we view politicians as maximizing agents who pursue their own selfish interests rather than as benevolent agents seeking to maximize aggregate welfare. Our modeling focuses on the political interactions between a government that is concerned both with campaign contributions and with the welfare of the average voter and a set of organized special-interest groups that care only about the welfare of their members. What is distinctive in our approach is the role that we ascribe to political contributions: we see the gifts made by interest groups not so much as investments in the outcomes of elections, but more as a

means to influence government policy. In our view, the manner of campaign and party finance in many democratic nations creates powerful incentives for politicians to peddle their policy influence. Then the structure of trade protection is bound to reflect the outcome of a competition for political favors; this is the central theme in our story.

In our model, lobbies make implicit offers of political contributions as functions of the vector of trade policies (import and export taxes and subsidies) adopted by the government. Taking account of these offers, the government sets policy to further its own objectives, which include (perhaps among other things) a concern for reelection. In the political equilibrium neither the government nor any lobby has an incentive to alter its behavior; no lobby can revise its contribution schedule so as to induce the government to choose a policy that would yield its members higher net welfare, nor can the government realize political gains by changing policy given the contribution offers it faces.

We have derived an explicit formula for the structure of protection that emerges in such a setting. Our formula relates an industry's equilibrium protection to the state of its political organization, the ratio of domestic output in the industry to net trade, and the elasticity of import demand or export supply. Also, the protection provided to all politically organized industries increases with the relative weight the government attaches to campaign contributions vis-à-vis voter welfare and falls with the fraction of voters that belong to an organized lobby group. We have discussed in some detail the determinants of the size of the equilibrium contributions made by different interest groups, the relative political power of these groups, and the division of political surplus between the government and the lobbies.

The questions we have addressed in this paper are of considerable independent interest. Beyond this, the tools that we have developed for studying the relationship between special interest groups and policy-makers may be applicable to many additional problems. For example, our approach could be used to study the endogenous de-

sign of social transfer schemes, environmental regulations, or government spending programs. We conclude the paper with a brief discussion of two possible extensions, still within the area of trade policy, that show the flexibility and potential usefulness of our approach.

The first extension allows for more political competition among the special-interest groups. In our model such competition is highly circumscribed, because the various industry groups oppose one another only to the extent that owners of specific factors also protect their interests as ordinary *consumers*. In reality, the most serious political opposition to protection arises when higher prices stand to harm other *producer* interests downstream. The users of intermediate inputs often are as politically active against import barriers as are the domestic manufacturers who favor such protection.

The model can readily be extended to allow for imported intermediate inputs. Suppose, for example, that there is one such good, producible at home with labor and a sector-specific input. Suppose further that the intermediate good is used in some or all of the sectors producing nonnumeraire goods, but not in the sector that produces good 0. Then the aggregate reward to the owners of the specific factor used in the production of final good i becomes $\pi_i(p_i, q)$, where q is the domestic price of the intermediate good. The reward to the owners of the specific factor used in domestic production of the intermediate good depends only on q . We can proceed as before to derive the equilibrium trade policies and campaign contributions.

Two notable results emerge from such an exercise. First, imports of the intermediate good may be subsidized in the political equilibrium, even if the interests of the owners of the specific factor used in producing that good are represented in the political process. This contrasts with the situation for politically organized final-good producers, all of whom succeed in securing at least some (effective) trade protection. Producers of intermediates are more vulnerable politically, because the representatives of the final-goods producers bid vigorously against tariffs on intermediates, whereas opposition

to protection on consumer goods is much less intense. Second, the formula for the equilibrium import tariff or export subsidy applicable to trade in any final good can be decomposed into two terms, one with the same form as in Proposition 2, the other being an increasing function of the equilibrium tariff applicable to intermediate inputs. Both of these results suggest that the political process tends to favor the interests of final-good producers relative to those of intermediate-good producers.

The second extension incorporates policy interdependence among large trading economies. The literature on tariff wars, starting with the classic paper by Harry Johnson (1953), examines noncooperative policy games between governments that single-mindedly serve the public interest. Similarly, studies of negotiated tariff agreements (see e.g., Wolfgang Mayer, 1981) generally begin with the assumption that the state enters international negotiations with the aim of maximizing aggregate welfare. Greater insight could be gained into international economic relations, we believe, by considering governments that are guided in their external dealings by domestic political pressures. Our 1992b working paper takes a first step in this direction, applying our approach to domestic politics in an analysis of international trade wars and trade talks. A next step might be to assess the relative desirability of alternative international "rules of the game." Such rules limit the policy choices open to national governments and change the nature of the strategic interactions between elected officials and their constituents. Our framework could be used to generate predictions about what domestic policies will emerge from the political process in different institutional settings, and therefore to evaluate which rules give rise to preferred policy outcomes.

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