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TRADE AND THE FOOD INDUSTRIES:
PUBLIC AND SOCIAL CHOICE*

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1. Introduction

If any one idea can be said to unify the discipline of economics, it is that people optimize. They know what they want—what gives them utility—and they behave so as to achieve the greatest possible level of it, subject to a suitably-defined constraint. When they enter markets, consumers buy the bundle of goods that provides the maximum level of utility. Investors choose the right portfolio. Workers sell labor optimally, and so on. In each of these cases and many more, it seems that deciders obey a constraint of some kind, and that they are guided by an optimizing impulse. The optimizing method has proven to be both durable and flexible, and it is continually being employed to study new problems in the social sciences.

Public choice is a vast and heterogeneous literature aimed at understanding the interaction between the economy and politics. The central idea that appears to animate public choice is that people have just as much reason to behave optimally when participating in political matters as they do when entering markets.[1] Politics is a large and amorphous object. Who are the actors or deciders living inside of it, whose behavior we might come to understand by supposing that they optimize? They reside at every level of the political structure. Some, including voters, taxpayers, and consumers of public goods, can safely be said to behave as individuals. For others, including interest groups, the unit of observation is a collection of people who appear to behave in concert, striving to achieve a collective goal. Still others are part of the government itself: bureaucratic and elected officials and the like.

In the previous paragraph I have already hinted at my purpose in this paper. It is to sketch, in very broad strokes, what public and social choice are up to and how they can be employed to gain an understanding of a wide array of problems—mostly policy-related—in the field of economics. Two abiding themes shall run through the paper. The first is that when a bit of the familiar economizing impulse is applied to an extra-market problem (political participation, for instance), certain interesting and even critical aspects of a problem come within reach that were necessarily left aside otherwise. The second is that I shall relentlessly seek to adopt the viewpoint of a person

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[1] Brennan and Pincus (1987) "define public choice theory as the application of mainstream economics to the analysis of political institutions" (p. 23).

in the model, with an emphasis on the incentives he or she faces. What does it feel like to be a member of a council or committee? What are the forces and incentives acting on a firm that belongs to a cartelized industry? How do members of an interest group feel individually about the behavior of the group and, more to the point, how do the many individual views get added up or compiled into a "will" of the group?

The survey to which I turn in a moment can be divided—not so neatly, it turns out—into two pieces. One is strictly about this last question, namely, how can we, or *can we*, make sense of the problem of combining individual preferences into a collective preference ordering that legitimately represents the wishes of the group? This is the *social choice* problem, and in my view some familiarity with it can be a marvelous aid when one seeks to understand aggregate behavior. The other is a bit more broad, and it concerns issues of *public choice*, which may or may not be about collective decision-making, but which address problems in political-economic behavior and their bearing on matters of policy.

I take up these two ideas in the next two sections. In neither one do I attempt anything like a comprehensive survey. Rather, I hope to offer a little of the flavor of the approaches that get used, and if amongst my readers there are some few who see a way to augment their own ideas by appending a political element to an orthodox economic model of trade or of an industry, then I will have achieved my purpose here. In the fourth section of the paper I attempt briefly to accomplish something like this myself. There I lay out the model from a recent paper by McCorriston and Sheldon (1993), and I provide some specific suggestions about how one might augment their model with a political component. The changes that I say are possible do not improve their model—they change it, and as usual in such things the changes grant some advantages but they come at a cost.

2. Social Choice and Interest Groups

For people who have been trained since childhood to think that the democratic way is the correct and proper way to conduct public affairs, it seems natural to abide by the "will of the people" when making collective decisions. What is the will of the people, anyway? Far and away the leading regularity of the formal literature on social choice is the fact that no such thing can exist. No group of people, however honest and forthright, can possess a collective will in any coherent sense. My purpose in this section is to demonstrate how this claim works, drawing by way of illustration upon a series of examples of simple voting problems. Emphasis remains, where possible, on the viewpoint of people in the model, and I shall attempt to draw connections to the

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problem facing a garden-variety interest group, whether it be a producer lobbying organization or a collection of firms in a given industry.

Let us begin by laying down a bit of notation. Suppose that a group of voters $I = \{1, \ldots n\}$ faces the task of choosing collectively a way to order the elements of some finite alternative set X. Each voter $i \in I$ has a well-behaved preference ordering R_i over X. Given any pair $x, y \in X$, if i prefers x to y we say that $x R_i y$. A vector of preferences—one for each voter (a *profile*)—contains all of the information about individual wishes or preferences, and is denoted $\{R_i\}_{i=1}^n \in \Theta^n$, the set of admissible profiles. Let a social decision problem be denoted $C = (X, I, \{R_i\}_{i=1}^n)$.

Before making things more complicated, a glimpse at how slippery is the notion of a collective will might be helpful. Consider the simplest possible collective decision problem, including three voters and three alternatives, $X = \{x, y, z\}$. Suppose that the three voters' preferences (which may be strict—the example still works) over this X are given by

$$x R_1 y R_1 z$$

$$y R_2 z R_2 x$$

$$z R_3 x R_3 y.$$

Suppose further that they have decided to choose one of the three alternatives using simple majority rule. They convene and vote sequentially over pairs of alternatives, first between x and y, and then between the winner and z. What happens? Voters 1 and 3 prefer x to y, so x wins the first round. Voters 2 and 3 prefer z to x, so z wins the second round and looks to be the overall winner. However, we might imagine that voter 1 is displeased with this result, and prevails upon the committee to hold a third and final vote—between y and z. Here we find that 1 and 2 prefer y to z, so y is the winner. But this makes no sense: if we let R denote the collective preferences, defined so that $x R y$ whenever a majority of the voters prefers x to y, then we have

$$y R z R x R y.$$

An endless voting cycle results. There is no winner. Collective preferences defined according to majority rule are intransitive even though individual preferences are transitive. This perverse result was first discovered by Condorcet in the late 18th century, and is now known as the Condorcet paradox.

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In 1951 Kenneth Arrow published the first edition of his now famous *Social Choice and Individual Values*, in which he showed that the problem is far worse even than Condorcet and his followers had thought. Arrow's search was for a *social welfare function* mapping a profile into the set of preferences: $f : \Theta^n \to \Theta$. He showed that for a problem with at least three alternatives and three voters, if the domain of f is unrestricted (U), and if f satisfies the Pareto principle (P) and independence of irrelevant alternatives (I), then the rule must be dictatorial.[2] That is, there is a person whose preferences always agree precisely with the social preferences.

A vast literature exists in which Arrow's original theorem is extended to innumerable related settings. (For a thorough survey, see Sen (1986).) For our purposes it will be useful to illustrate why one should care about Arrow, by introducing a slightly more complex example, involving five voters and three alternatives. Let the alternatives be called x, y, and z. The rule or f to be used is the *Borda rule*. Each voter orders the alternatives from most- to least-preferred, and awards 2 points to his or her first choice, 1 to second, and 0 to third. These scores are added to determine the ranking. Here we have all of the ingredients of the Arrow set-up. What goes wrong? In short, the Borda rule violates (I). Let us now take a look at why. Consider the following set of preferences for our voters.

Voter	First	Second	Third
1	x	y	z
2	y	x	z
3	z	x	y
4	x	y	z
5	y	x	z

The Borda rule will award 7, 6, and 2 points to x, y, and z, respectively. Now suppose that the preferences of voters 2 and 5 change, the others remain the same, so that the profile is

Voter	First	Second	Third
1	x	y	z
2	y	z	x
3	z	x	y
4	x	y	z
5	y	z	x

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[2](U): Θ contains all possible orderings of the alternative set X; (P): for every pair $x, y \in X$, if $x R_i y$ for every i then $x R y$; (I): any two profiles in which the ordering of any two alternatives $x, y \in X$ by each i are unchanged, x and y must be ordered the same by their corresponding R.

Now, the scores are 5, 6, and 4 for x, y, and z respectively. Even though each voter still orders x and y the same way, the social ranking between them has changed. This is what it means to violate (I).

Though it may be unsatisfying at one level to have the outcome of a voting scheme appear to be whimsical in this fashion, there is something more sinister afoot. Arrow envisioned a group of individuals who are scrupulously honest. Yet the only impulse they have been given (and in Arrow, strictly speaking, they haven't even this) is the selfish one: they wish to further their own interests, and have no concern whatever for the well-being of other members of their model. Let us once again ask the question about incentives. How should a member of the model behave if his or her only aim is a selfish one? In short, the answer is that in every situation at least one voter will have an incentive to behave dishonestly.

Arrow asks quite a lot of his f. It must order the entire set of alternatives. In many social situations, all that is needed is to choose a single most-preferred outcome, and there is no interest in ordering the others. In 1973 and 1975, respectively, Gibbard and Satterthwaite (G-S) showed that something just as bad as Arrow's impossibility theorem—worse even—goes wrong when the social objective is to select a single best outcome. Emphasizing the informational and the incentive aspects of the problem, they proved that any non-dictatorial social *choice* function must be *manipulable*: there is at least one person who can gain by lying.

This point is crucial, and it bears some elaboration. A social welfare function (after Arrow) or a social choice function (after Gibbard and Satterthwaite) take as arguments voters' preferences. But these are known only if we ask the voters themselves, and from their viewpoint inside the model it may be best to lie. There are no penalties to lying here, people have no ethical convictions against it, and perhaps more to the point it is impossible to punish people for lying in any event. There is no means of detection. Unlike Arrow, G-S openly invited the people in their model to be dishonest, and what they discovered is precisely that some will do so.

The previous example can be illuminating here. Suppose that the voters' true preferences are those in the first of the two tables. Voters 2 and 5 both place y first. If the other voters are honest, but these two report the preferences in the second table—if they lie—then their preferred outcome will be chosen.

I am now prepared to claim that the same impulse matters in policy problems. To support the claim, let me mention a handful of situations where something resembling the simple voting problem

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is at work, and where strategic individual behavior can lead to "bad" outcomes. (Along the way, a subtle but essential difference between a social choice correspondence and a Nash equilibrium in a related game will be highlighted.) Situations that fit the mold include the cartel problem, the problem of coordinating political contributions in an interest group, and some public goods problems. In order to motivate a nascent and growing literature within social choice that I will argue offers a promising remedy to the various social choice problems, a quick look at a simple public goods problem will be useful.

Suppose that a community must decide whether to build a public good, say a new park. The members of the community must decide how much park they want and how much to contribute to it. To make the example simple, suppose that each person has a utility function $U_i(x, y_i)$, where x is the public good and y_i is i's consumption of a private good. Person i's endowment ω_i of the private good can either be consumed or contributed to the provision of x. Let this contribution be z_i, so that $z_i + y_i = \omega_i$. The public good is produced according to a well-behaved technology: $x = g(z)$, where $z = \sum_i z_i$.

A familiar result in this problem is Samuelson's condition for optimality, which requires that

$$\sum_i \frac{\partial U_i / \partial x}{\partial U_i / \partial y_i} = \frac{1}{g'}.$$

This is the condition that would be achieved by a social planner bent on maximizing a utilitarian (or Bergson-Samuelson) social welfare function (not to be confused with the Arrovian one!). Equally familiar is the fact that in the usual version of the model, if the members of the community are given free rein to do as they please, and if they take the contributions of others as given, contributing $z_i^*(z_{-i}^*)$, there will be too little of the public good provided. This results from the prisoners' dilemma aspects of the Nash equilibrium in such problems.

It should be emphasized that the Nash equilibrium is not a social choice correspondence for this problem. It is defined directly on strategies, whereas a SCC is a mapping from preferences into the outcome space. Suppose that i's preferences in the public good problem can be indexed by γ_i, which could be a parameter in a Cobb-Douglas utility function, for example. The outcome space would be the non-negative reals. A SCC here would be a mapping from $f(\{\gamma_i\}_{i=1}^n)$ with image space $\mathcal{R}_+$. It would require knowledge of preferences, and Gibbard and Satterthwaite guarantee that when we ask people for their preferences at least one will lie.

The theory of *implementation* combines game theory (and the strategic behavior that drives the Nash equilibrium) with social choice in the hope that the impulse to strategize can be channelled

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productively. It begins with a social choice setting—consisting of an outcome space X, a group of individuals, and their preferences over X—and a SCC, f. It seeks to design a game whose players are the individuals themselves, and whose equilibrium outcome coincides with the result of f. Bear in mind that any candidate f exhibits some undesirable properties. The hope is that the game which implements f does not. That is, the SCC is salvaged in the sense that the outcome one would see under f if everyone were honest is *actually* seen as a result of play of the game. The power of an implementing game comes from the fact that it works for any possible set of individuals' preferences, even those that are unknown at the time the game is specified.[3]

The implementation approach to the social choice problem appears to be a promising theoretical foundation for producing positive (as opposed to negative) results concerning the decision-making behavior of groups.

3. Public Choice and Industry

Whence comes economic policy? The powerful forces that push and pull at the innumerable policies that government uses to alter markets come from all points of the compass. Before turning to the roles played by the various self-interested actors in this drama, it is worth a brief pause to consider what has been over the years the most common conceptualization of the source of policy. Put simply, where markets fail there is a role for government, and it can be expected to do what is right to correct the failure. On this view, one can formulate the government's problem as one of choosing from amongst the various policy instruments, and setting the levels of those instruments, so as to maximize some measure of aggregate well-offness. Policy just arises, almost spontaneously.

The things that have been learnt by this approach form the very backbone of policy analysis. The aggregate welfare maximization problem can be designed in such a way that the solution will automatically be efficient. Policies that distort markets will create inefficiencies, and one can measure their seriousness using the welfare function as an index. In addition to an understanding of what policy should be in a given situation, the welfare-maximization approach also permits a comparison across policy instruments. There is the question of where the "government" got its collective objective, a question that is suggested strongly by the discussion of the previous section. But there is no question that the approach has much to teach us.

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[3]The extant literature on implementation is of two varieties: complete and incomplete information. Maskin (1977), whose landmark paper much of the recent literature can be traced to, assumed that people in the model are perfectly informed about each other's preferences. For a recent survey see Moore (1992). Palfrey (1992) surveys the literature on implementation in Bayesian equilibrium and mechanism design, in which an important element is the uncertainty agents have about each other's preferences.

How can one build upon it to extend what it can reveal about the political process? One idea is to express the social welfare function as a Bergson-Samuelson weighted sum of welfare levels for a number of constituent groups in the economy, and to search empirically for the value these weights take in a given situation. The political preference function aproach (Oehmke and Yao 1990; Rausser and Freebairn 1974) does just this, and while a great deal is learned by it the source of the government's objective is generally not attacked, and those affected by the policy are often treated as politically inert. That is, they do not spend their valuable resources in affecting policy; policy just happens to them.

A somewhat richer version of the problem, though one with its own set of problems, obtains when the people in the model are given a self-interested optimizing impulse. In the remainder of this section I review briefly the two central forces that are apparently at work in determining policy. Like all objects of value, there is a demand for policy and there is a source—a supply. Demand arises from the ranks of the affected parties; supply stems from the members of the governing bodies. Let us now turn to a discussion of each.

The Demand for Policy

Let us suppose that from the viewpoint of a set of interest groups who are affected by a given policy, the mechanism determining the policy is a machine whose inner parts and workings are inscrutable to them. For example, domestic producers and importers of a given tradeable commodity both care about the tariff level on imports. Their wishes concerning its level are diametrically opposed, and to be sure they (or their agents) know something of how policy gets done. But for now let us say they only know that if they pour money into the government, then the policy in question moves in their favor. For each of the concerned groups, suppose that η_i denotes the dollar contribution of group i to a lobbying effort aimed at changing a policy p in its favor. This policy is determined jointly by the vector $\eta = (\eta_1, \ldots, \eta_n)$ of lobbying levels.[4]

Suppose further, in this abstract setting, that group i achieves aggregate welfare or happiness given by $U_i(p(\eta), x_i; \alpha_i)$, where x_i is a vector describing i's economic environment (possibly including a set of i's other decision variables) and α_i indexes i's preferences.[5] Two things about this set-up are crucial. One is the fact that groups can choose to devote some of their resources

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[4]The first formal use of this sort of policy function of which I am aware is found in Findlay and Wellisz (1982), who treat a tariff problem. See also Coggins et al. (1991).

[5]Clearly, the difficulties inherent in specifying a group's collective preferences featured in the previous section are being set aside now.

to altering a policy, which in turn affects the level of resources they can contribute to altering the policy, and so on. For instance, if the group in question is a set of producers, whose aggregate revenues depend upon the level of a tariff policy, then spending η_i to change the tariff takes away from profits directly, but it may augment profits indirectly by increasing revenues. The other is that with this sort of simultaneity to worry about, the analytical stakes are raised somewhat as even clear-cut comparative statics results can quickly run out of reach.

Now, suppose that for any given level of the policy variable, all groups behave optimally in choosing x_i, and let $x_i^*(\eta)$ denote this indirect, optimality-built-in function, where the dependence on p has been suppressed. If we assume that the groups are Nash players in the unfolding game they play against each other, then an equilibrium in the lobbying game can be defined as follows. The ith group's *best response* to a vector of all other groups' strategies is

$$\eta_i^*(\eta_{-i}; \alpha_i) = \operatorname{argmax}_{\eta_i} U_i(p(\eta), x; \alpha_i).$$

DEFINITION. *An equilibrium for the abstract lobbying game is a vector* $\eta^* = (\eta_1^*, \ldots, \eta_n^*)$ *such that for each* $i \in I$, η_i^* *is a best response to* η_{-i}^*.

The question of existence of an equilibrium in lobbying games of this kind is not trivial. (In general, the simultaneity between the group's resources and its lobbying contribution introduces mathematical complexities. See, for example, Coggins et al. 1991.) What has all of this trouble bought us? First, it has bought us a formal link between the behavior of groups and the resulting policy. Second, it has provided the tools to shed some light upon the "rent-seeking" question (Tullock 1980) or the dissipation question related to it. If one uses a measure of the welfare change to each group as a result of the policy, and compares it to the lobbying contributions, then one can evaluate the degree of dissipation (the ratio of contributions to aggregate welfare change). Answering this question empirically is not so easy, primarily because it is maddeningly difficult to observe the η_i (but see Hazlett and Michaels 1993).

The Supply of Policy I: A Self-Serving Bureaucracy

The assumption that government's willingness to change a policy in response to political activity can be described as a simple functional relationship like $p(\eta)$ is not entirely satisfying. *Why* is government willing to respond to lobbying; and *how* does it respond? This is another question that has received a good deal of attention in the public choice literature. Niskanen's (1971) pathbreaking book laid out the key elements of the political economy of government bureaus, and it

spawned a large literature that continues to grow.[6] Motivating Niskanen's work is the notion that the output of a bureau is not a market good. Indeed it is usually difficult or impossible even to measure output, and so it is input that becomes important. How many staff members does the bureau employ? How big is its budget?

Another important ingredient of Niskanen's story is the idea that people in a bureau are people. They have all of the same incentives to further their own interests that a consumer or an entrepreneur has. And a bureau collectively has a certain amount of power. It is liable to be a monopoly provider of the service it produces, and its budget is determined by its output or, if output cannot be measured, by its perceived output. Niskanen envisions the bureau maximizing its budget while ensuring that the resulting budget can cover costs.

The purchaser (that is, the larger government) wants to achieve the bureau's services at least cost. Indeed, efficiency requires exactly this. But at the optimal solution the bureau's marginal value of an expansion in the budget is positive. That is, the bureau's incentives are different than those of the government. The result in Niskanen's model is that the bureau's budget is too large. Certain institutional arrangements, including the committee structure in the U.S. Congress, might help to restrain the bureau, but Niskanen's work illustrates how a government populated by people with the same impulse we ascribe to consumers (and call it good) can have an affect on the supply of a government service or policy.

The Supply of Policy II: Self-Interested Politicians

What, then, of the elected officials who are designated by the electorate to make public decisions? Well, they too are people, and by now it should come as no surprise to learn that there is a sizable literature studying the behavior of politicians by treating them as self-interested optimizers. Many of the studies in this tradition can be placed in one of two categories. The first is concerned with the electoral problem itself. How should candidates behave to maximize the probability of getting elected? What is the optimal platform in a race where voters' preferences are uncertain? The second is concerned with what politicians do once they have attained their seats. Which policies do they choose, and why?

Downs (1957) pioneered the study of electoral politics using the optimizing party. He argued that under certain conditions there is an optimal platform, in the sense that it maximizes the probability of election. For Downs, voters are arrayed along the political left-right spectrum in

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[6] For a review of Niskanen and a survey of related literature, see Mueller (1988).

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some fashion, and the median voter in the distribution of voters is the one politicians seek to please, for in doing so they ensure that a simple majority of voters will prefer them to any other candidate located elsewhere in this "issue space." If the issues that matter to people are greater than one in number—if the issue space is of a higher dimension—then Downs's median voter model breaks down, and there is another large literature that treats the politician's problem in this context.[7]

What motivates politicians to vote the way they do in the legislature? Surely many things, but one assumption that can be useful is to suppose that their objective is to maximize their campaign contributions. In the lobbying model specified above, the government was inert. If individual politicians know that their voting behavior affects the level of contributions they receive from political action committees and other sources, however, then the "government" becomes a different entity altogether.

One strategy for modelling this twist—albeit one that neglects individual politicians—is to revise the political game, perhaps assuming that the lobbying groups are Nash players against each other, but that the government is a Stackelberg leader to the interests. This is a strategy adopted by Magee, Brock, and Young (1989), whose model of a general political economic equilibrium treats the political economy as one of general economic equilibrium in the Stolper-Samuelson tradition. For Magee, Brock, and Young, political parties seek to maximize their electoral chances by balancing the gains from campaign contributions (achieved by setting policies that aid their contributors, who are producers) against the cost of alienating voters who are harmed by the policies. Their model is perhaps the most complete in that it accounts for all of the simultaneous factors that help to explain voting behavior, interest group behavior, and the behavior of politicians.

4. An Example

In this section my purpose is to illustrate the effects that can be felt when a few of the ingredients from section 3 are mixed into a policy-related model of an agricultural problem. Specifically, I choose one recent article that addresses a question in strategic trade, and I propose two ways to augment the model of that paper with two different political set-ups and examine what changes. The paper in question is McCorriston and Sheldon's 1993 *Oxford Economic Papers* article.

Their paper addresses the problem facing a government that wishes to set an optimal trade policy for an industry whose member firms possess market power and compete with a foreign supplier. The model includes a productive agricultural sector (farmers who purchase fertilizer) and two

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[7]The regularity in this literature is that there is no majority rule winner. That is, there is no best platform in the sense that it can defeat any alternative in a majority-rule election. See Plott (1967) and Kramer (1973).

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groups (or types) of firms: domestic producers and importers. Aggregate fertilizer demand functions (derived from an aggregate farmer production function) for domestic and imported fertilizer are, respectively

$$Q_1 = A_1 - B_1 p_1 + K p_2$$

$$Q_2 = A_2 + K p_1 - B_2 p_2$$

where p_i is the price of Q_i. Collective farmer profits are given by

$$\Gamma = f(Q_1, Q_2) - p_1 Q_1 - p_2 Q_2,$$

where f is a quadratic aggregate production function that yields the linear derived demands. Total market elasticity of demand is

$$\epsilon = \frac{-(B_1 p_1^2 + B_2 p_2^2 - 2K p_1 p_2)}{Q}.$$

The elasticity of substitution between Q_1 and Q_2 is

$$\sigma = \frac{(p_1/p_2)(B_1 B_2 - K^2)}{(B_1(p_1/p_2) - K)(B_2 - K(p_1/p_2))}.$$

Firms in group 1 and group 2 achieve profits of, respectively,

$$\pi_{1i} = (p_1 - c_1)q_{1i} \quad \text{and}$$

$$\pi_{2i} = (p_2 - c_2 - t)q_{2i}.$$

Each of the groups holds an (aggregate) conjecture V_k about how the other group will respond to a change in Q_i. Aggregate first-order necessary conditions for the groups are

$$p_1 - c_1 - Q_1 V_1 = 0$$

$$p_2 - c_2 - t - Q_2 V_2 = 0.$$

The government's objective is to

$$\max_t \quad W = \Gamma + Q_1(p_1 - c_1) + tQ_2.$$

McCorriston and Sheldon calculate the optimal fertilizer tariff, and compare it to the actual EC minimum import price. They also calculate the tariff-equivalent quotas for these two import tariffs, and they make welfare comparisons across the four policies and to the pre-policy situation.

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Thus, we see that their paper is expressly concerned with a policy question, it includes several actors with a large stake in the policy, and it conducts a welfare analysis to compare a variety of policy instruments. All of the ingredients are present to support many of the approaches that have been introduced in the present paper. In the remainder of this section I provide some suggestions for how the different alternatives might be employed, and for two of them I give a bit more detail than for the others. The calculations that would give the answers, from their model, to the questions I have called interesting have not been conducted for this paper. But they would appear to be feasible, and my hope is that in presenting the ideas I am able to tie together what I have called the major themes of my paper.

Tariff Revenue-Maximizing Government

Suppose that the government's objective is to maximize not aggregate welfare, but rather its tariff revenue. We then have the following problem for the government:

$$\max_{t} \quad tQ_2.$$

The solution will satisfy

(1)
$$\frac{\partial(tQ_w)}{\partial t} = Q_2 - \frac{t(b_1 + V_1)}{(b_1 + V_1)(b_2 + V_2) - k^2} = 0.$$

In order to deduce the effects of this new behavioral rule for the government upon the welfare of the various groups in the model, one must resolve it, employing the optimality condition in (1). Having done so, however, it would be possible to trace out the costs and the benefits of such a policy. If in addition the use to be made of tariff revenues is made a part of the model, yet another group of actors can be included in the policy analysis.

Lobbying Equilibrium

Suppose now that the government sets the tariff according to a function $t = t(\eta_1, \eta_2)$, where η_i is lobbying contributions by farmers and domestic producers. (It would also be possible to permit the importing sector lobby directly.) Suppose further that the tariff function is such that if no lobbying occurs, then the tariff level is equal to a pre-determined value $\hat{t}$ (either zero or, if an alternative level is determined elsewhere, it could be set to that value): $t(0, 0) = \hat{t}$. Each group's lobbying expenditures are effective. That is, because the fertilizer producers wish to have the tariff high, assume that $\partial t/\partial \eta_1 > 0$. Likewise, $\partial t/\partial \eta_2 < 0$.

The new equilibrium will be a pair (η_1^*, η_2^*), accounting for the strategic nature of the political problem facing groups, such that

$\pi_1(t(\eta^*), X; \alpha_1) \geq \pi_1(t(\eta_1, \eta^*_{-1}), X; \alpha_1)$ for domestic firms; and

$\Gamma(t(\eta^*), X; \alpha_2) \geq \Gamma(t(\eta_2, \eta^*_{-2}), X; \alpha_2)$ for farmers.

As before, the model must be resolved with this new behavioral set-up, and now in addition one must choose a functional form for the tariff function. The results will yield, as before, the welfare values for each group and the tariff revenue that the government collects. Additional questions, such as the degree of dissipation (net welfare gains for all groups divided by their aggregate lobbying contributions) could also be asked.

There is virtually no end to the elaborations of this sort that could be applied to the policy model in question, or to many others like it. But the point is not elaboration for its own sake. Rather, it is to explain more thoroughly the impulses that cause policy to look as it does that leads me to suggest the attempt.

5. Conclusions

The assumption that people behave optimally that animates much of economics has proven to be very powerful, as are the analytical tools available for formalizing the assumption and finding solutions to models built upon it. Why not apply the same assumption, and the same techniques, to problems in political economy? People who we like to say optimize in their roles as consumers and producers are the same people who walk into the voting booth, or join interest groups of unending variety.

The message of this paper has been a mixture of caution and encouragement. I have tried to present a few ideas from the social choice literature that provide reason to pause before attributing to any collection of individuals the will to behave optimally. Arrow's theorem and its descendants are at work in various and sundry places in this arena, and they should be attended to.

But the encouragement I have offered comes from two sources. The first is a fairly recent development, which was treated very lightly here, that appears to offer a much more promising avenue for the study of collective decision-making than the discouraging results strewn about most of social choice. Implementation theory gives some hope that the everyday observation that groups of people *do* decide things can be made sense of formally without doing violence to our beloved notions of mathematical coherence and consistency.

The second source of encouragement is purely pragmatic in nature. Though social choice warns us not to claim things that cannot be true, it is not so clear that for this reason we should

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freeze, unable to say anything for fear of saying something that is wrong. Practically speaking, and with a nod to Friedman's methodological arguments, models of political economic behavior that employ the collective optimization assumption have a great deal to teach us. Even if the people in the model cannot be doing the things that we say they do, still the models themselves can be worthwhile.

My primary story—that the trouble it takes to inject a bit of political activity into a policy model is worthwhile—can, I think, but put to use in myriad ways. The cost of doing so is added complexity, increased problems with finding and making sense of data, and in some instances living with a slightly shaky analytical foundation. But the benefits are to be found in the increased realism and, especially, in the new questions that come within reach once an economic model has been made political economic.

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