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Abstract

Models of economic systems involving government intervention by definition include some policy variables, or policy instruments, through which the policy is implemented. In general, economists have tended to view these variables as exogenously given. While convenient in dealing with some analytical problems, this attitude is not always adequate, as it abstracts from the realities of political-economic life. Evidently, economic policy is not independent of the economic structure, and policy variables are codetermined with endogenous economic variables within an integrated political-economic structure.

Keywords

Agriculture, Policy, Political Economy

Disciplines

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**Endogenous Policy Theory:
The Political Structure and Policy Formation**

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ENDOGENOUS POLICY THEORY: THE POLITICAL STRUCTURE AND POLICY FORMATION

I. Introduction

Models of economic systems involving government intervention by definition include some policy variables, or policy instruments, through which the policy is implemented. In general, economists have tended to view these variables as exogenously given. While convenient in dealing with some analytical problems, this attitude is not always adequate, as it abstracts from the realities of political-economic life. Evidently, economic policy is not independent of the economic structure, and policy variables are codetermined with endogenous economic variables within an integrated political-economic structure.

Where government intervention has continued for a sufficiently long duration, it often exhibits certain regularities which may be captured by incorporating governmental behavior relations in the model. However, for explanation and prediction purposes, it would be desirable to establish hypotheses concerning the formation of the observed political regularities. Several approaches are conceivable in performing this task. These will be discussed elsewhere. In the following, we present our own approach which adjoins a political structure to the economic structure. That is, a theory of endogenous policy formation that explicitly recognizes the conflicting interests of various groups in the economy and the political process through which these conflicts are resolved is developed and employed in modeling the political structure which, along with the economic structure (possibly combined with a model of the physical system), forms an integrated structure of the political-economy.

Political behavior may be viewed as a process of accommodation among conflicting interests. Social power and influence relations are, evidently, important determinants of the ensuing political-economic equilibrium. We, therefore, begin the

following exposition by examining the concept of social power as envisaged in extant literature. We subsequently develop a theory of the political-economy which explicitly recognizes the various policy-making centers and interest groups in the system. Our theory views the political economy as a bargaining game among organized groups with conflicting interests. The attained political equilibrium is identified with the solution of the bargaining game. In this game some groups are too poorly organized for bargaining, but their reaction to policy choices affects policy formation. The presentation is concluded with an examination of the economic efficiency of the political-economic equilibrium and some special organizational issues.

2. The Theory of Social Power

In a well-known paper by Dahl designed to deal systematically with the concept of "power," Dahl commented: "Most people have an intuitive notion of what it (power) means. But scientists have not yet formulated a statement of the concept of power that is rigorous enough to be of use in the systematic study of this important social phenomenon" (Dahl, 1957, p. 201). While much progress has been made since, the concept is still vaguely stated. Evidently, a general concept of power is difficult to nail down,¹ and it would appear that the phenomenon is best handled in reference to specific contexts. In the present analysis, social power is dealt with in the framework of a political-economy and not as a separate issue. Yet, there are some general aspects of the power relation which should be explored before considering political-economic models. In the following, we present several power theoretic concepts proposed by March (1957), Simon (1957), Dahl (1957, 1968), Nagel (1968), and Harsanyi (1962a, 1962b) which view social power as the control of actors' behavior and suggest measuring person A's power over person B in terms of its actual or potential *effects*; that is, in terms of the changes that A causes or can cause in B's behavior. As Dahl puts it, A has power over B to the extent to which "he can get B to

do something B would not otherwise do" (Dahl, 1957, p. 203 cited in Harsanyi, 1962a, p. 67).

Power is defined as "a relation among people not an attribute or possession of a person or group" (Nagel, 1968, p. 129). The following dimensions of the power relation are usefully distinguished.

a. The *base* of power refers to the resources that the influencing actor uses in controlling the influenced actor(s)' behavior. There exists a variety of power bases of which the following are most important: (i) *legitimate base of power*, embodied in constitutionally and legally determined prerogatives or derived from prevailing social norms, (ii) *economic base of power* consisting of economic resources under the control of the influencing actor which can be brought to bear in influence attempts, and (iii) *political base of power* consisting of control over policy choices, political appointment, etc.²

b. *Extension or domain* of power consisting of the set of actors over whom the influencing actor has power.

c. *Range or scope* of power comprising the set of responses (behaviors, choices) that the influencing actor can induce.

d. *Strength* of power consisting of the actual or potential change in the influenced actors' well-being that the influencing actor can effect.

e. The *cost* of power—the actual or opportunity cost to the influencing actor of exercising power.

f. *Means* of power. How the influencing actor mediates between his power bases and the influenced actor choices.

g. *Amount and direction* of power: a measure of the influencing actor power over the influenced actor. Dahl (1957) proposed to adopt the probability of the influenced actor submitting to the influence attempt as an appropriate measure. Harsanyi (1962a) stressed the strength of power relative to the cost of power as the

pertinent measure. The outlined concept of power in effect conceives of power as a unilateral relation: A controls B's behavior. However, as Harsanyi (1962a, 1962b) emphasized, the power relation need not be unilateral and bilateral (multilateral) or reciprocal power situations also must be considered.

This is an important distinction for it warrants different ways of modeling the two distinct social interactions. In a unilateral power situation, the influenced actor is characterized by a reaction function which describes the actor's response to the policy instruments while the influencing actor selects the values of the policy variables so as to entice the influenced actor's reactions most desired by the influencing party. In a reciprocal power situation, on the other hand, all parties are involved in a mutual bargaining relationship, whose resolution determines the actors' agreed actions. In game theoretic terms, the unilateral power relation includes Stackelbergian leaders and followers while the reciprocal power relation essentially is a bargaining game.

3. Organization of the Political System

A political system, or a *polity*, arises whenever market coordinated individual actions are superseded by some form of nonmarket collective action. This is true even when the sole motivation for collective activity is to change a market relationship. To be effective, every organization for collective action must satisfy certain *organizational imperatives*; in particular, it must feature a policy-making and coordination *center* and *peripheral participants* whose actions are controlled by the center. In a minimal political-economy the center consists of policymakers in government while all other economic agents (households, producers, etc.) are peripheral participants. Decisions taken by the center determine resource allocation and income distribution in the political-economy and thereby the peripheral participants' levels of well-being, hence, the interest that the latter have in the center's policy choices. For obvious reasons, certain groups of individual peripheral participants share common interests in the

center's policy choices. *Interest groups* are thus defined. As joint group action may enhance the group's power over the center's policy decisions, some interest groups get organized for collective lobbying activity in pursuing their common interest. As Olson (1965) has asserted, organizing for political action is hampered by strong individual proclivity to "free ride" and is in general costly. Hence, some interest groups may never get organized. Four types of groups may thus be distinguished in a political-economy.

1. A center consisting of policymakers. We shall usually assume that only one center exists, but often a *polycentric* structure, involving several centers, is constitutionally established. Each center is assumed to have a well-defined objective function and the capacity to negotiate and enter binding agreements (tacit or explicit) with other organized groups, including other centers.

2. *Organized interest groups*. Such groups characteristically evolve a group choice mechanism including a particular governance structure and effective leadership capable of rallying group members and of negotiating and entering into binding agreements with other organized groups, including policy centers.

3. *Unorganized but responsive interest groups*. Such groups fail to evolve any machinery for collective choice, but individual group members actively respond to the center's policy choice.³

4. *Politically inert interest groups*. Members of such groups have a common political-economic interest. Yet, not only do such groups lack any mechanism for coordinated joint action, their members are also unresponsive to the center's policy choices. We shall use the terms *power groups* in referring to the first three group types and *organized groups* in referring to policy-making centers and organized interest groups. As indicated, the latter groups are characterized by group choice mechanisms and a capacity to negotiate and enter binding agreements.

This classification of groups determines the nature of the political process. As an organized interest group is capable of negotiating and entering a binding agreement with a center, the relationship between these two organized groups defines a reciprocal power situation in which each party employs its means of power in a bargaining process. When there are n -organized interest groups and a single center, the attained political-economic equilibrium is a solution to a $(n + 1)$ -person bargaining game. In a polycentric group configuration, every center with an interest in the relevant political outcome takes an active part in the corresponding, $(g + n)$ -person bargaining game where g is the number of interested policy centers and n is the number of organized interest groups.

Consider a political-economy consisting of a single policy-making center and a single unorganized but reactive interest group. The relationship between the two define a unilateral power situation. That is, the policy-making center is aware of the unorganized group's reaction function and selects a policy that would maximize the center's policy objective function given the unorganized interest group reaction pattern.

But how is the political-economic equilibrium determined under a group configuration involving all forms of power groups, that is, policy-making center(s), organized interest groups, and unorganized but responsive interest groups? Under these circumstances, the unorganized groups' reaction functions are treated as structural relations, not unlike the economic structural relations, and the bargaining game among the organized groups is conducted as before, taking into account the unorganized groups' reaction functions as given.

Politically inert interest groups play no political role—affecting the political-economic outcome solely through their economic responses which are reflected in the economic structural relations.

Finally, it is worth noting that the bases of any group's power, especially the economic and political bases of power, depend on the ability of the group leadership to

overcome members' propensity to "free ride" and to mobilize members' resources for the joint lobbying activity. The means of achieving members' mobilization are discussed elsewhere (Olson, 1965; Hardin, 1982) and will not be addressed here.

4. The Political-Economic Structure

4.1. The General Model

The present formulation deals with the formation of quantitative policy (Tinbergen, 1956). We shall restrict the analysis to static systems, but a dynamic version can be worked out without changing the main implications of the present analysis.⁴

Let

$$(1) \quad F(y, x_0; z) = 0$$

represent the economic structure, where y is a vector of endogenous variables, z is a vector of exogenous variables, and x_0 is the vector of policy instruments. The value of x_0 is determined by policymakers in the center. How are values of the policy instruments, x_0 , determined?

In line with our aim of endogenizing policy formation, the following model of the political-economy is first considered. Let the political-economy comprise a single policy-making center and n organized interest groups, so that only reciprocal power relations prevail.

Let X_0 be the set of politically feasible values of x_0 . X_0 is restricted in several ways: Some variables must be nonnegative (prices, output, etc.); others are constrained by administrative and technical considerations; and, finally, there are modes of intervention which are unanimously regarded as illegitimate, and are, therefore, ruled out as politically unacceptable. Thus, the main political resource at the disposal of policymakers is legitimate power, the coercive power of the state, and the

technical and administrative ability to carry out the various policies.⁵ This base of power determines X_0 . Another important political constraint is assumed—lump-sum income transfers are not allowed.

Depending on the members' ability to organize for a concerted political action, their wealth, socioeconomic status, political representation, etc., each interest group controls certain economic and political resources which constitute its base of power. Let x_i denote the actions (means of power) taken by the i -th group. These may consist of actions such as going on strike, supporting a particular individual in an internal party struggle, blocking legislative measures favored by the policymakers, contributing to election funds, setting prices under the group's control at particular levels, etc. Let X_i be the set of possible actions open to the i -th interest group. Clearly, X_i depends on the group's base of power. Let

$$X = \times_{i=0}^n X_i.$$

Since the endogenous variables, y , depend on the policy instruments, x_0 , the state of the political-economic system is fully determined by the vector

$$x = (x_0, x_1, \dots, x_n).$$

To simplify the presentation, we shall, henceforth, ignore the exogenous variables. It is assumed that the preference ordering of the states of the political-economic system by each interest group may be represented by a group's objective function. Since the actions of each interest group are aimed at the policymakers, and in order to simplify the analysis, we shall assume additive objective functions as follows.

$$\begin{aligned} U_0 &= U_0(x) \\ (2a) \quad &= u_0(x_0) + \sum_{i=1}^n v_i(x_i). \end{aligned}$$

The index $i = 0$ is reserved for the decision makers, and $i = 1, 2, \dots, n$ for the n organized interest groups. Thus,

$$(2b) \quad \begin{aligned} U_i &= U_i(x) \\ &= u_i(x_0) - w_i(x_i) \end{aligned} \quad i = 1, 2, \dots, n.$$

The U_i 's are scalar functions expressed in terms of a common numeraire, say, dollars or pounds.⁶ The $u_i(x_0)$'s are the groups' evaluation of the state of the economic system; u_i may be equated with economic quantities such as disposable income, consumer's surplus, government expenditure, and the like. The function, v_i , will be referred to as the *strength* function of the i -th group over the policymakers; v_i is positive when the i -th group pursues a "reward" policy, and negative when a "penalty" policy is adopted. The subjective cost to the i -th group of attempting to influence the policymakers is given by the function, w_i , which is positive whenever an active influence attempt is made by the group. Now, each interest group will seek to minimize the cost of power, w_i , for given levels of pressure (strength) it exerts on the policymakers. This is achieved by a proper selection of actions, x_i . Let x_i^0 be the "cost of power" minimizing a combination of actions by group i . The following functions may then be defined:

$$\begin{aligned} c_i &= w_i(x_i^0) & i = 1, 2, \dots, n \\ s_i(c_i, \delta_i) &= \begin{cases} \alpha_i(c_i) = v_i(x_i^0) & \text{when } x_i^0 \text{ is a "reward," } (\delta_i = \alpha) \\ -\beta_i(c_i) = v_i(x_i^0) & \text{when } x_i^0 \text{ is a "penalty," } (\delta_i = \beta) \end{cases} \\ & & i = 1, 2, \dots, n. \end{aligned}$$

Equation (2a) and (2b) may be written as:

$$(2'a) \quad U_0 = u_0(x_0) + \sum_{i=1}^n s_i(c_i, \delta_i)$$

$$(2'b) \quad U_i = u_i(x_0) - c_i \quad i = 1, 2, \dots, n.$$

We shall employ the notation $U(x)$ and $u(x_0)$ to denote the $n + 1$ vector valued functions $[U_i(x)]$, and $[u_i(x_0)]$, respectively. It is assumed that the $u_i (i = 0, 1, \dots, n)$ are such that the set of feasible $u(x_0)$ (i.e., $x_0 \in X_0$) is compact and convex, the s_i 's are concave in c_i , and all functions are twice differentiable.

Henceforth, we shall adopt the following nomenclature. The objective function, $U_i (i = 0, 1, 2, \dots, n)$ will be referred to as group i 's *extended objective function*, and U_i may consist of some or all of the following three components: (i) the *policy objective function*, $u_i(x_0)$; (ii) the *pressure function*, $\sum_{i=1}^n s_i(c_i, \delta_i)$; and (iii) the *cost of power*, c_i . Note that in the present group configuration the pressure function and the cost of power are never included in any single extended objective function.⁷

In the following, two concepts of the efficiency frontier will be distinguished: (a) *the economic efficiency frontier*—the set of efficient points $u(x_0)$, $x_0 \in X_0$,⁸ and (b) *the political efficiency frontier*—the set of efficient points $U(x)$, $x \in X$. The first set consists of efficient combinations of the policy objective functions attainable under the constraints imposed by the economic structure and the political feasibility. Here, political rewards, or penalties, are not permissible. The second set is obtained from the first by allowing interest groups to reward policymakers. Political efficiency, thus, implies economic efficiency. Given some plausible concavity properties of the various functions, the two efficiency sets are outer boundaries of the corresponding compact and convex feasibility sets.

The essence of the political problem is the resolution of the conflict arising between the various groups attempting to influence policymakers to adopt a policy $x_0 \in X_0$ that will maximize the group's objective function. Thus, x_0 is the *scope* of all interest groups. The *domain* of each interest group consists of a single actor—the policymakers. In its influence attempt, the group may employ its *power base* to exert political pressure by promising "rewards" for a policy favored by the group and threatening "penalties" in response to a policy considered harmful to the group's cause.

How is the conflict resolved? Since cooperation, rather than confrontation, is the governing phenomenon in political-economic systems, one must look for a cooperative solution.⁹ Following Harsanyi (1962a), we shall, therefore, adopt the Nash solution to the two-person game (Nash, 1953) and Harsanyi's generalizations to n -person games (Harsanyi, 1963).

The political-economic equilibrium is now defined as the joint solution to the cooperative game and the structural economic equations.

4.2. Conflict Resolution and the Equilibrium Relations

In this section we explore the main properties of the equilibrium solutions and their implications for the analysis of power relations. The case of two players—the policy center and one interest group—is investigated first, to be followed by an analysis of the $(n + 1)$ player case.

(a) *The policy center and one organized interest group.* According to Nash (1953), the cooperative game is preceded by a noncooperative game, where the disagreement payments $[t_0(\bar{x}), t_1(\bar{x})]$ are determined by the players' threat strategies $(\bar{x}) \in X$. Given the disagreement payoffs, the solution to the cooperative game is the joint strategy $\bar{x} \in X$ which maximizes the product $[U_0(x) - t_0][U_1(x) - t_1]$ such that

$U_i(\bar{x}) - t_i \geq 0$, ($i = 1, 2$). Now, it has been shown by Harsanyi (1963) that the equilibrium threat strategies $\bar{x} = (\bar{x}_0, \bar{x}_1)$ are such that

$$(3) \quad t_0(\bar{x}) - H_1 t_1(\bar{x}) = \max_{x_0 \in X_0} \min_{x_1 \in X_1} [U_0(x) - H_1 U_1(x)]$$

where H_1 is a constant such that

$$(4) \quad H_1 \geq 0$$

$$(5) \quad U_0(\bar{x}) + H_1 U_1(\bar{x}) = \max_{x \in X} [U_0(x) + H_1 U_1(x)],$$

and \bar{x} is the cooperative solution strategy. H_1 is thus the slope of the political efficiency frontier at the solution point, i.e.,

$$H_1 = - \left. \frac{dU_0}{dU_1} \right|_{x=\bar{x}}$$

Expressing the objective functions in terms of (2'a) and (2'b), condition (3) becomes

$$(3') \quad t_0(\bar{x}_0, \bar{c}_1, \bar{\beta}_1) - H_1 t_1(\bar{x}_0, \bar{c}_1) = \max_{x_0 \in X_0} \min_{\substack{c_1 \geq 0 \\ \delta_1 \in (\alpha, \beta)}} \{u_0(x_0) + s_1(c_1, \delta_1) - H_1 [u_1(x_0) - c_1]\}.$$

A necessary condition for (3') is

$$(6) \quad - \frac{\partial \beta_1(\bar{c}_1)}{\partial c_1} + H_1 \geq 0,$$

where the strict equality holds whenever $\bar{c}_1 > 0$. Notice that, due to the additivity of the objective functions, the interest group will always adopt a penalizing threat strategy under disagreement, namely, $\bar{\delta}_1 = \beta$.

Stating (5) in terms of (2'a) and (2'b), it turns out that, due to additivity, the maximization of $U_0 + H_1 U_1$ in the cooperative game consists of:

- (i) the interest group adopts a reward policy, i.e., $\bar{\delta}_1 = \alpha$;
- (ii) \bar{c}_1 is selected so as to maximize $\alpha_1(\bar{c}_1) - H_1\bar{c}_1$;
- (iii) \bar{x}_0 is selected so as to maximize $u_0(\bar{x}_0) + H_1u_1(\bar{x}_0)$.

That is, $u(\bar{x}_0)$ is in the economic efficiency frontier. Consequently, the following condition holds:

$$(7) \quad \frac{\partial \alpha_1(\bar{c}_1)}{\partial c_1} - H_1 \leq 0,$$

with the strict equality holding if $\bar{c} > 0$. The Nash solution of the game for the case $\bar{c}_1 > 0$, $\bar{c} > 0$ is depicted in Figure 1.

In Figure 1 the curve AB represents the political efficiency frontier, while the curve AC represents the economic efficiency frontier.

The curve FG depicts the reward to policymakers and its cost to the interest group. It is the locus of the pairs

$$[u_0(\bar{x}_0) + \alpha_1(c_1), u_1(\bar{x}_0) - c_1]$$

for given \bar{x}_0 and where c_1 is the cost of power entailed by the reward strategies. The curve DE is the set of all possible disagreement payoffs associated with the threat policy, \bar{x}_0 , on the part of policymakers, i.e., it is the locus of the pairs

$$[u_0(\bar{x}_0) - \beta_1(c_1), u_1(\bar{x}_0) - c_1],$$

where c_1 is the cost of power entailed by the penalty strategies. The set of all disagreement payoffs corresponding to given cooperative solution are lines such as GI . The interest group will, therefore, select a threat strategy entailing the cost, \bar{c}_1 , and resulting in the disagreement payoffs (t_0, t_1) . Notice that at G , the cooperative solution,

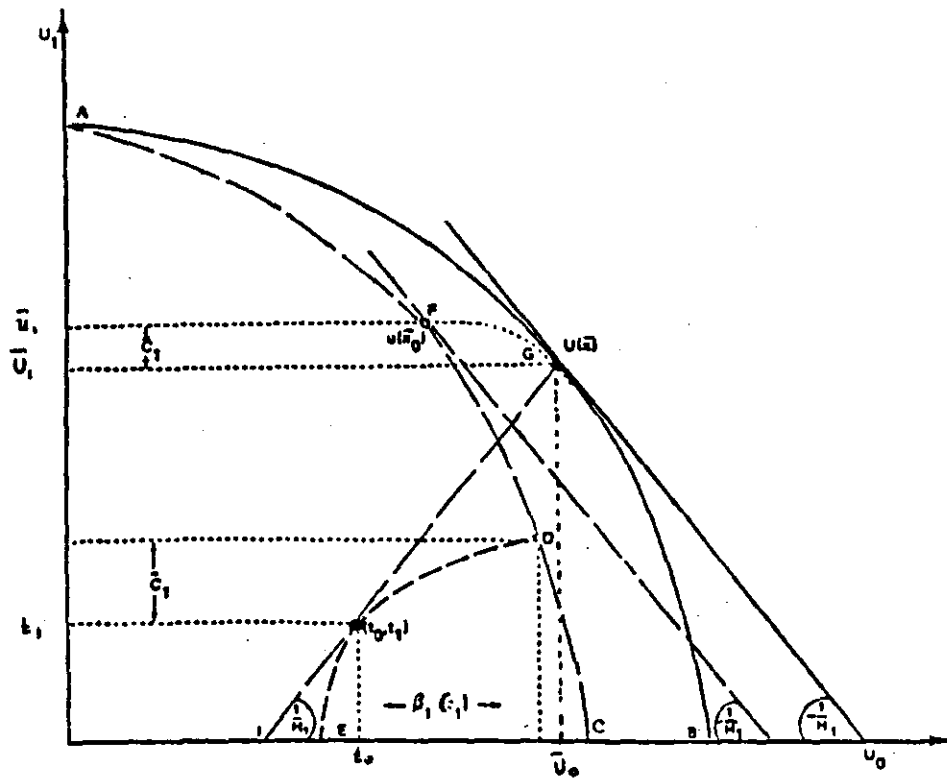


FIGURE 1

Nash Solution of a System Consisting of Policymakers and One Interest Group

$$\frac{\partial \alpha_1(\bar{c}_1)}{\partial c_1} = H_1;$$

at F ,

$$H_1 = -\frac{du_0}{du_1}$$

and at (t_0, t_1) ,

$$\frac{\partial \beta_1(\bar{c}_1)}{\partial c_1} = H_1.$$

One expects that in most realistic systems some threats exist, and thus $\bar{c}_1 > 0$.¹⁰ Consequently, the strict equality in (6) holds. Conditions (iii), (6), and (7) then imply that the solution of the conflict involves the maximization of

$$W = u_0(x_0) + \frac{\partial \beta_1}{\partial \bar{c}_1} u_1(x_0).$$

In other words, the equilibrium of a political-economic system, consisting of the policy center and one organized interest group, is associated with the maximization of the sum of the policymakers' objective function and the interest group objective function, weighted by the marginal strength of its power over the policymakers, $\partial \beta_1(\bar{c}_1) / \partial c_1$. The equilibrium weight is regarded constant. It is worth noting that the equilibrium value of x_0 is invariant under order-preserving linear transformations of the objective functions. We shall refer to $W(x_0)$ as the *political governance function*.

(b) *The policy center and n-organized interest groups.* The case of n-organized interest groups is analyzed with the aid of the solution concept proposed by Harsanyi (1963). We shall refrain from repeating the full development of the concept and will limit the presentation to the final set of conditions defining the solution.

According to Harsanyi, the solution to the overall game depends on the solutions to subgames among all possible coalitions. The subgames determine a cooperative payoff to each member of the coalition, which, in turn, affects the disagreement payoffs as a member in higher order coalitions. Let N denote the set of all players, i.e., $N = \{0, 1, 2, \dots, n\}$, S a subset of N and $\bar{S} = N - S$, the complement of S in N . Let U_i^s and t_i^s denote, respectively, player i 's payoff when S and \bar{S} employ their threat strategies and the disagreement payoffs of player i from coalition S in which he is a member. Let also \bar{x}^s be the threat strategy of coalition S , where x^s denotes the variables under the coalition's control and X^s the feasible strategy space of S . The solution is then given by the following conditions:¹¹

$$(8a) \quad H_i \geq 0 \quad i \in N$$

$$(8b) \quad \sum_{i \in N} H_i U_i^N = \max_{x \in X} \sum_{i \in N} H_i U_i(x)$$

$$(8c) \quad U_i^s = U_i(\bar{x}^s, \bar{x}^{\bar{s}}) \quad i \in S, S \subset N$$

$$(8d) \quad t_i^s = \sum_{\substack{R=1 \\ R \subset S}}^{s-1} (-1)^{s-r+1} U_i^R \quad s > 1, i \in S, S \subset N$$

$$(8e) \quad H_i(U_i^N - t_i^N) = H_j(U_j^N - t_j^N) \quad i, j \in N$$

$$(8f) \quad \sum_{i \in S} H_i U_i^S - \sum_{j \in \bar{S}} H_j U_j^{\bar{S}} = \sum_{i \in S} H_i U_i(\bar{x}^S, \bar{x}^{\bar{S}}) - \sum_{j \in \bar{S}} H_j U_j(\bar{x}^S, \bar{x}^{\bar{S}})$$

$$= \max_{x^S \in X^S} \min_{x^{\bar{S}} \in X^{\bar{S}}} \left[\sum_{i \in S} H_i U_i(x^S, x^{\bar{S}}) - \sum_{j \in \bar{S}} H_j U_j(x^S, x^{\bar{S}}) \right] \quad S, \bar{S} \subset N$$

subject to

$$(8g) \quad \begin{aligned} H_i(U_i^S - t_i^S) &= H_k(U_k^S - t_k^S) & i, k \in S \\ H_j(U_j^{\bar{S}} - t_j^{\bar{S}}) &= H_m(U_m^{\bar{S}} - t_m^{\bar{S}}) & j, m \in \bar{S} \end{aligned}$$

where for the purpose of the maximin operation the quantities H_i, H_k, H_j, H_m , and $t_i^S, t_k^S, t_j^{\bar{S}}, t_m^{\bar{S}}$ are regarded as constants. The symbols s and r refer to the number of members in coalition S and R , respectively. Notice, also, that $U_i^N = U_i(\bar{x})$ is the cooperative payoff of the overall game. The constants H_i are normalized by setting $H_0 = 1$.

Now, stating the objective function in terms of (2'a) and (2'b), we find that, due to additivity, the maximization of $\sum_{i=1}^n H_i U_i$ in equation (8b) implies:

- (i) Interest groups adopt a reward policy,

$$\text{i.e., } \bar{\delta}_i = \alpha \quad i = 1, 2, \dots, n.$$

- (ii) \bar{c}_i is selected so as to maximize

$$\alpha_i(\bar{c}_i) - H_i \bar{c}_i \quad i = 1, 2, \dots, n.$$

- (iii) \bar{x}_0 is selected so as to maximize

$$u_0(\bar{x}_0) + \sum_{i=1}^n H_i u_i(\bar{x}_0).$$

That is, $u(\bar{x}_0)$ is on the economic efficiency frontier.

Consequently, the following conditions hold:

$$(9) \quad \frac{\partial \alpha_i}{\partial \bar{c}_i} - H_i \leq 0 \quad i = 1, 2, \dots, n$$

where the strict equality holds whenever $\bar{c}_i > 0$.

Consider, now, the subgame between $S = \{i\}$ and $\bar{S} = N - \{i\}$ and then, due to the additivity assumption condition (8f) implies, a penalizing threat policy on the part of i , namely, $\bar{\delta}_i^{(i)} = \beta$ and

$$(10) \quad -\frac{\partial \beta(\bar{c}_i^{(i)})}{\partial c_i^{(i)}} + H_i \geq 0, \quad i = 1, 2, \dots, n,$$

where the strict equality hold whenever $\bar{c}_i^{(i)} > 0$. The policy applies to all interest groups when facing a coalition of all other groups.

For reasons which have already been discussed, one expects the subgame to involve a positive threat, that is, $\bar{c}_i^{(i)} > 0$, and the equality in (10) holds. Combining (10) and (iii) above, it is found that the overall solution is associated with a maximization of

$$W = u_0(x_0) + \sum_{i=1}^n \frac{\partial \beta_i(\bar{c}_i^{(i)})}{\partial c_i^{(i)}} u_i(x_0) = u_0(x_0) + \sum_{i=1}^n b_i u_i(x_0).$$

In other words, the equilibrium of a political-economic system is associated with the maximization of the sum of the policymakers' objective function and the interest groups' objective functions weighted by their marginal strength of power over the policymakers. The equilibrium weights are regarded as constants, although their values are endogenously determined.

The theory thus predicts a maximizing behavior of the political-economic system. However, the quantity being maximized (i.e., the *political governance function* of the single center- n interest groups' political-economy) is not necessarily the policymakers' objective function. It is, rather, a reflection of the social power structure and the interests of the various power groups.

The endogenous policy theory expounded above may be used in estimating the parameters of the political power structure in actual political-economies based on

observed behavioral regularities (see, for instance, Zusman, 1976, and Zusman and Amiad, 1977).

Note also that, for given individual disagreement payoffs, t_i^N , the solution to the simple bargaining game (Harsanyi, 1977) is the cooperative strategy choice \bar{x} such that

$$(11) \quad \Gamma[U(\bar{x})] = \max_{x \in X} \prod_{i=1}^n [U_i(x) - t_i^N].$$

We shall now consider two additional power group configurations of the political economy: (i) a polycentric structure and (ii) a configuration involving unorganized but responsive groups.

(c) *A polycentric configuration.* Consider a group configuration comprising g policy-making centers and n organized interest groups. Let j ($j = 1, 2, \dots, g$) index the policy-making centers and i ($i = 1, 2, \dots, n$) index the organized interest groups. Let, also, $x_0 = (x_{01}, \dots, x_{0g})$ be the vector of policy instruments controlled by the various policy-making centers. That is, we assume that each policy-making center is constitutionally vested with the authority to determine the value of some specific policy instruments. Furthermore, it is presupposed that a reciprocal power relationship prevails among the various centers so that each center has some power over all other centers. Hence, the extended objective functions of the policy-making centers are

$$(12) \quad U_j = u_j(x_0) + \sum_{i=1}^n s_{ij}(c_i^j, \delta_i^j) + \sum_{k \neq j} S_{kj}(c_k^j, \delta_k^j) - \sum_{k \neq j} c_j^k \quad j, k = 1, 2, \dots, g$$

where $u_j(x_0)$ is the policy objective function of center j reflecting the preferences over the entire policy space, X_0 ; $s_{ij}(c_i^j, \delta_i^j)$ is the strength of power of the i -th interest

group over the j -th center; $S_k(c_k^j, \delta_k^j)$ is center k 's strength of power over center j ; c_i^j, c_k^j , and c_j^k are, respectively, the costs of power of the i -th interest group over the j -th center, the k -th center over the j -th center, and the j -th center over the k -th center. δ_i^j and δ_k^j are indicator variables indicating whether a "reward" or "penalty" strategy has been adopted in the strategic interaction between the corresponding power groups. The extended objective functions of the organized interest groups are

$$(13) \quad U_i = u_i(x_0) - \sum_{j=1}^g c_i^j, \quad i = 1, 2, \dots, n,$$

where $u_i(x_0)$ is interest group i 's policy objective function defined over X_0 .

Since reciprocal power relationships prevail among all power groups, the equilibrium solution of the political-economy is a solution to the corresponding $(g + n)$ -person bargaining game. In the Appendix, the solution to this $(g + n)$ -person simple bargaining game (where all disagreement payoffs, t_i^0 , are treated as given) is explored.

The main finding of the analysis is that, the equilibrium of a political-economic system whose group configuration comprises n organized interest groups and g interested policy-making centers is associated with the maximization of a policy governance function, $W(x_0)$.

$$(14) \quad W(x_0) = \sum_{i=1}^n B_i u_i(x_0) + \sum_{j=1}^g B_j \mu_j(x_0);$$

$W(x_0)$ is a weighted sum of the corresponding power groups' policy objective functions. Two alternative interpretations of the weights included in the policy governance function are suggested in the Appendix: (i) the weight ratio, B_i/B_j and

B_k/B_j , are marginal strengths of power relative to incremental increases in the cost of power; and (ii) the weight ratios, B_i/B_j and B_k/B_j , are relative gains of the corresponding power groups in a cooperative political-economic equilibrium as compared with a conflict situation.

(d) *One policy-making center, n-organized interest groups and m unorganized but responsive interest groups.* Under the group configurations considered hitherto, inter-group power relationships were all reciprocal. By introducing unorganized but responsive interest groups, unilateral power relationships are added to the power structure. We shall assume that the reaction of the k -th unorganized but responsive interest group affects the well-being of the policymakers alone, the n organized interest groups are assumed to be indifferent to the unorganized group reaction. This assumption and the assumption of a single-policy center are made in the interest of simplicity and brevity; they could be easily relaxed. As will become evident, subsequently, the required change in the analysis warranted by the relation is minimal and obvious.

Let $r_h(x_0)$ denote the reaction function of unorganized but responsive interest group h , and let $r(x_0) = [r_1(x_0), \dots, r_m(x_0)]$. Under the present assumptions, the reaction function affects the policy-making center alone. We may then express the center's (index $i = 0$) policy objective function as follows

$$(15) \quad \begin{aligned} u_0 &= u_0(x_0, r(x_0)) \\ &= \hat{u}_0(x_0). \end{aligned}$$

Hence, substituting $\hat{u}_0(x_0)$ for $u_0(x_0)$ everywhere in section 4.2.(b), one obtains the relevant analytic results. Extending the analysis to other group configurations is similarly implemented.

The analytically crucial conclusion of the preceding analysis is that, for a fairly broad spectrum of group configurations, the political-equilibrium is associated with the maximization of the political governance function.

Accepting the basic tenets of the methodological individualism doctrine, any teleological interpretation of this result should be avoided—the political-economy, as a social aggregate, has no objectives of its own. The maximization result is strictly an "as if" outcome originating from strategic interactions among individual rational actors.

Secondly, the maximized quantity is certainly not the policymakers' objective function; rather, it is a weighted sum of the power groups' specific interests, where the weights depend on the prevailing power structure. Hence, no *prima facie* case for "public interest" maximization is implied; neither can an unqualified assertion be made concerning the economic efficiency of the political-economic equilibrium.

5. The Economic Efficiency of the Political-Economic Equilibrium

In the following, we seek to evaluate the economic efficiency of the political-economic equilibrium employing standard welfare economic criteria. Focusing exclusively on equilibrium states of the system implies a strictly static analysis. Despite its great importance, no evaluation of political-economic dynamic processes is possible without an appropriate dynamical theory.¹²

Secondly, our analytic approach to political-economies is primarily partial, focusing on a particular sector of the economy. The economic evaluation should, therefore, address actors outside the analyzed political-economy as well as those participating in it.

Two fundamental questions must be addressed in any normative analysis:

- (i) Are the equilibrium values of the policy instruments socially optimal?
- (ii) Are the political-economic-transaction costs minimal?

In answering the first question, we shall employ the standard welfare economic criteria (conditions for Pareto optimality). The second question refers to a far more complex phenomenon. Any real social system in which individual actors engage in exchange entails certain welfare losses designated as *transaction costs*. Transaction costs are hard to define; but, generally speaking, they refer to the difference between individual utility levels attainable under the existing technology and resource availability constraints and the utility levels actually achieved under the particular social organization. That is, the term "transaction costs" refers to the "value" of all departures from "first best" resource utilization due to system imperfections—a rather tautological description.¹³ In the present context, we do not pursue the full range of transaction cost-related issues; rather, our analysis focuses on the costs entailed by the political-economic process including costs originating from the corresponding informational and incentive structures. The principal cost components are "bargaining costs," the "cost of power" mentioned above and the kind of costs emphasized in the rent-seeking literature [e.g., the costs that individual actors incur when seeking a larger share of an import quota (Krueger, 1974)] as well as program administration and enforcement costs.

It should be emphasized that the distinction between welfare losses due to socially nonoptimal levels of the policy instruments (category (i) above) and those due to political-economic transaction costs (category (ii) above) is largely arbitrary. It was adopted in order to facilitate the exposition but, in principle, optimal political intervention is the one minimizing the sum of all costs. Furthermore, as the various organized groups cannot ignore significant political-economic transaction cost, these cost components are also relevant determinants of the political-economic equilibrium. Political-economic transaction costs are, thus, important elements of any positive theory.

What are the necessary conditions for economically efficient equilibrium values of the policy instruments? Is it heuristically arguable that departures from the following conditions are likely to induce economically inefficient policy choices.

(a) All individual actors whose well-being is influenced by the choice of policy instruments should be represented in the political process. Thus, when net government revenue is affected by the selected values of the policy instrument, such choices may affect taxation rates; and taxpayers should, therefore, be represented in the political process. Note that taxpayers who ordinarily constitute a politically inert interest group may, in fact, be represented in the political process by a fiscal authority whose policy objective function is to minimize net government deficit. Taxpayers as such should still be regarded as a politically inert interest group.

(b) All organized groups' policy objective functions should fully and faithfully reflect the group members' preferences over the policy space, X_0 . In other words, policy effects should be fully internalized. Two principal types of serious distortions, or externalities, are likely to occur in political-economic systems: (i) group members' interests may be distorted in the political process; and (ii) groups may regard certain aspects of the system as collective goods/bads from whose effects group members cannot be excluded.

The former distortion derives from intra-group political relations which tend to emphasize group leaders' interests—essentially a public agency problem. Empirical evidence on the existence of such distortions in real political-economic systems were reported in the literature (Zusman and Amiad, 1977).

The latter distortion may be viewed as an Olsonian "logic of collective action" operating through the political process. It is a pervasive distortion which seems to seriously afflict political-economies featuring choices of time profiles of policy instruments (Zusman and Rausser, 1990a and 1990b).

(c) The weights attached to the organized groups' policy objective functions should be equal (i.e., $b_1 = b_2 = \dots = b_n = 1$ and $B_i = B_j = B_k = B$ for all i, j , and k). Depending on one's preferred interpretation of the weights, condition (c) may imply equal distribution of power or permissible side payments. The latter interpretation can be obtained from the Appendix by noting that, under permissible side payments, we may write $s_{ij}(c_i^j, \alpha_i^j) = c_i^j$ and $S_{kj}(c_k^j, \alpha_k^j) = c_k^j$. By implication, the gains from a cooperative political-economic equilibrium are then equal for all organized groups.

The necessity of the economic efficiency conditions (a) through (c) may be illustrated by a simple example consisting of a market for a subsidized commodity. The example is presented graphically in Figure 2. The economic structure comprises the supply and demand relations described in Figure 2 by the curves SS' and DD' , respectively. A third structural relation is the price-subsidy equation:

$$P_p = P_c + s,$$

where P_p denotes producers' price, P_c denotes consumer price, and s is subsidy per commodity unit. The three economic structural relations together determine the endogenous variables, P_p , P_c , and q for a given subsidy level, s . Thus, $P_c = P_c(s)$, $P_p = P_p(s)$, and $q = q(s)$.

The group configuration is assumed to consist of a policy-making center or government (indexed by $i = 0$) and two organized interest groups: consumers ($i = 1$) and producers ($i = 2$). Regarding the zero subsidy equilibrium, E , as the reference state, the policy objective functions are as follows. The government wishes to minimize the subsidy cost represented in Figure 2 by the area of the rectangle $P_c P_p D B$; consumers are interested in maximal consumer surplus represented in Figure 2 by the area of the trapeze $P_e E B P_c$, while producers seek to maximize the producer surplus represented in Figure 2 by the area of the trapeze $P_e E A P_p$. Hence,

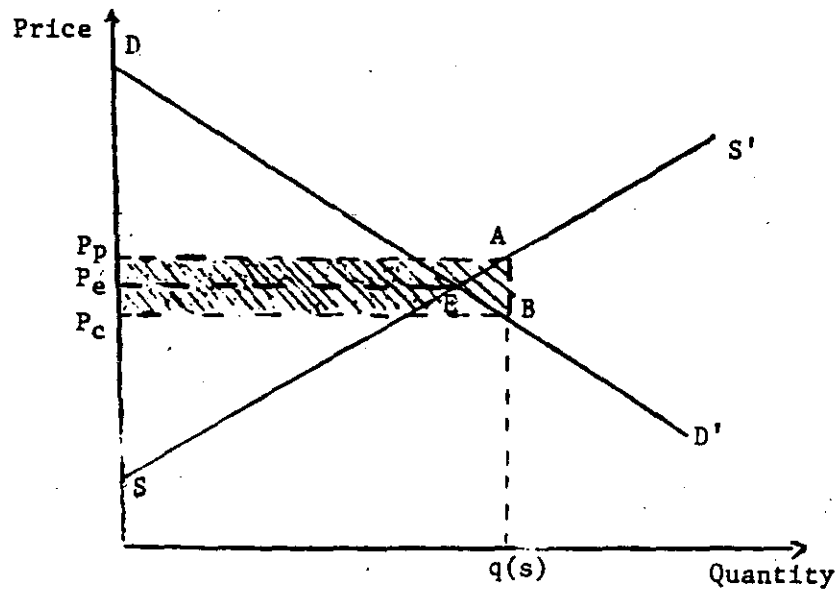


FIGURE 2

The Political-Economy of a Subsidized Competitive Commodity

$$u_0(s) = -s q(s)$$

$$u_1(s) = [q(0) + q(s)] [P_c(0) - P_c(s)]/2$$

$$u_2(s) = [q(0) + q(s)] [P_p(s) - P_p(0)]/2.$$

Note that the area of the triangle ABE represents the subsidy deadweight loss. The political-economic equilibrium level of subsidy is the one maximizing the policy governance function:

$$W(s) = u_0(s) + b_1 u_1(s) + b_2 u_2(s),$$

where $b_1 \geq 0$ and $b_2 \geq 0$ are the weights associated with the consumer and producer groups, respectively.

When power is equally distributed (or side payments are allowed), $b_1 = b_2 = 1$. Then $W(s)$ is plainly the net social surplus; it is equal to the negative value of the area of the triangle ABE in Figure 2. Hence, $\bar{s} = 0$ is the political-economic equilibrium solution; that is,

$$\begin{aligned} W(0) &= \max_s [u_0(s) + u_1(s) + u_2(s)] \\ &= \max_s [-s[q(s) - q(0)]/2] = 0. \end{aligned}$$

The economically efficient solution obtains because taxpayers, the only politically inert interest group, are represented by the policy-making center [condition (a)]; the policy objective functions faithfully represent the groups' preferences with respect to subsidy levels [condition (b)],¹⁴ and political power is equally distributed [condition (c)]. It is easy to see that departures from these conditions will yield nonoptimal equilibrium subsidy levels—although the possibility of mutually compensating deviations, however unlikely, cannot be ruled out.

Having analyzed the economic efficiency of political-economic equilibria for group configurations composed of organized groups only, we wish now to explore the welfare implications of extending the configurations to include unorganized groups as well.

It is immediately obvious that the inclusion of a political inert interest group, without representation in the political process, by definition violates economic efficiency condition (a) and is, thus, conducive to economic inefficiency. Including an unorganized but responsive group creates a completely different situation, for much depends now on the effects of the unorganized group's reaction function on the participating organized groups. Thus, if $\hat{u}_0(x_0)$ in equation (15) may be expressed as follows

$$(18) \quad \hat{u}_0(x_0) = u_0(x_0) + h(r(x_0)),$$

where $h(r(x))$, the effect of the unorganized group's reaction function on the center's well-being, faithfully reflects the unorganized group's preferences over the policy space (i.e., $h(r(x_0)) = \sum_{k=1}^m u_k(x_0)$), then necessary conditions (a) and (b) are met. As a corollary, we now add one more necessary condition for the economic efficiency of the political-equilibrium, namely:

(d) If the group configuration of the political-economy includes an unorganized but responsive interest group, then the total impact of the unorganized group's reaction functions on the participating organized groups should faithfully reflect the unorganized but responsive group policy preferences. If the group configuration includes several unorganized but responsive interest groups, then (d) must hold for each and every such group. It is unlikely that condition (d) precisely obtains. However, it is not unreasonable to expect that responsive unorganized groups may improve political-economic performance over pure inertia.

The set of necessary conditions for political-economic efficiency provides yardsticks for normative evaluation of political-economies. Since these conditions are often violated, economic inefficiencies are pervasive; the attendant social costs depend, of course, on the nature and size of the departures from optimality.

However, the preceding analysis does not exhaust the relevant welfare implications, and any attempt at evaluating the performance of political-economic systems should not fail to consider the associated political-economic transaction costs. Of the many possible categories of such costs, we explore only two:

- (i) Political-economic transaction costs incurred during the political process in which values of the instrumental variables are determined.
- (ii) Transaction costs incurred during the policy implementation phase.

These comprise the cost of administering the policy program, the cost entailed by imperfect information structure, and costs due to distorted incentive systems.

Bargaining costs arise during the policy formation phase as power groups with conflicting objectives seek an agreed policy that will serve best each group's interest. Agreement is reached through negotiation, bargaining, and mutual persuasion which are usually costly in terms of time and human relation. While the Nash-Harsanyi bargaining theory presupposes the dominance of cooperative solutions with conflict situation serving merely as unimplemented threats, casual empiricism strongly suggests that conflict situations do materialize and threats are often carried out. Evidently, disparities in the parties' perceptions of the conflict outcomes often precipitate costly tests of power. In general, bargaining costs are greater the more diverse the groups' interests, the greater the stakes involved, and the less compromising the group leaders' attitudes.

The cost of power, especially under disagreement, is partly embodied in the bargaining cost. But even in the cooperative solution when organized interest groups are engaged in reward strategies, society may incur net social losses. It would be wrong to regard the full cost of rewarding policymakers as the net social costs, for these costs create benefits valued by political decision agents. As the latter are also members of society, reward values should be included in the social welfare calculus. Thus, in the single center- n organized interest groups' configuration, the quantity $\sum_{i=1}^n s_i(c_i, \alpha_i) - \sum_{i=1}^n b_i c_i$ is maximized in the political-economic equilibrium so that economic efficiency condition (c) is also necessary for optimal equilibrium political reward policies.

The last type of political-economic transaction cost incurred at the policy formation phase is the *policy decision costs*. The term refers to resources expended on information gathering and calculation when reaching policy decisions as well as welfare losses due to mistaken choices. Though hard to distinguish from the already-mentioned bargaining costs, decision costs constitute a distinct cost category.

Two types of political-economic transaction costs predominate the policy implementation phase: (i) program administration costs and (ii) rent-seeking costs. The composition and extent of the first category depend on the nature of the policy program. Evidently, administering infrastructure development programs does not resemble tax collection, etc. Of particular interest from the present study's viewpoint are the relationships between the policy choices, the administrative costs, and the rent-seeking costs. For example, policies requiring public intervention at the microeconomic level (e.g., supply control through production allotment, resource rationing by public authorities) will likely entail heavy administration costs, in contrast with macroeconomic policies (e.g., public control of the market rate of interest and foreign currency rate of exchange) where administration costs are minimal.

A rent-seeking cost consists of resources expended by individual economic agents seeking to increase their share of politically created and allocated rent-yielding rights. An import quota is a celebrated example explored by Krueger (1974). Similarly, production allotments and politically allocated resource utilization and trade rights entail rent-seeking behavior and cost. Rent-seeking costs include all departures from the "first best" resource allocation induced by the politically created rent. Because rent seeking often involves bribing and other illicit activities, the full social cost associated with rent seeking may appreciably exceed direct economic resource cost. The amount of rent-seeking cost produced in the political-economy depends on the market structure for the politically created rent-bearing rights. As Krueger had shown, under competitive market conditions, the social loss is equal to the total value of the politically contrived rent which may be considerable indeed.¹⁵

Controlling shipments across international borders is inexpensive in comparison with controlling domestic trade flows. Hence, the administrative cost of policing production quotas of domestically produced and consumed commodities may be rather high. Thus, total political-economic transaction costs in most policy programs may be substantial and must be included in the policy evaluation calculus. Political-economic transaction costs are often important policy determinants since there are considerable potential trade-offs between the political-economic transaction costs and other group policy objectives. Thus, rent-seeking and administrative costs may be substantially reduced by selecting less stringent quantitative restrictions and lower rent-producing prices.

Hitherto, our normative analysis has been focused on policy evaluation, largely avoiding prescriptive statements. Yet, normative prescriptions are suggested as by-products of the foregoing analysis. In the context of endogenous policy formation, prescriptive statements necessarily refer to constitutional and institutional choices.

As our welfare analysis suggests, the social costs of political actions may well exceed its social benefits. It is argued subsequently that such socially undesirable political action can, in fact, be brought about by those who stand to gain from state involvement while hardly any mechanism exists to prevent unwarranted government intervention in economic processes. Hence, a constitutional choice conducted behind the "veil of ignorance," when individual and group attitudes are more universalistic,¹⁶ may bar foreseeable unwarranted government intervention. Other constitutional and institutional choices should seek to insure that efficiency conditions (a)-(d) are satisfied. While no perfect constitutional and institutional structures are to be expected in a second-best world, social choices may still be improved under appropriate constitutional and institutional structures.

6. Concluding Remarks

The theory expounded in this paper seeks to endogenize economic policy formation. To this end, a political-economy is conceived as a system of interacting interest power groups with conflicting objectives—the evolving policy representing a resolution of the underlying conflict.

According to this conception, the constitutional structure, whether formal or informal, establishes a center, or centers, with policy selection and implementation authority. These centers are usually identified with the government. As the chosen policies affect the well-being of many individual economic actors in various ways, interest groups consisting of individuals sharing common interests are formed. Some of the groups may be organized for joint political action by "political entrepreneurs" seeking to advance their own private interests. Depending on their level of organization and responsiveness to the center(s)' policy choices, interest groups participate in the policy formation process. The ensuing political-economic equilibrium is a solution to a bargaining game among organized groups, including the policy-

making center(s). The responses of unorganized interest groups are taken into account by the participants in the bargaining game. The resulting policy choice depends on the interests and political power of the organized groups.

As group rationality is presupposed, the cooperative solution of the bargaining game corresponds to the maximization of a certain "policy governance function"—a weighted sum of the various groups' policy objective functions, where the weights, whose values are endogenously determined, may be interpreted as the marginal strength of the interest groups' power over the policy-making center. The policy governance function should not be interpreted as the policymakers' objective function, nor should it be identified with the public interest. Hence, the political-economic equilibrium is not necessarily efficient. Since the efficiency conditions are quite restrictive, and as political-economic transaction costs are practically unavoidable, one expects many political-economic equilibria to be inefficient. While government action may be called for in cases of severe market failure, the present theory implies that such intervention will come about whenever it is in the interest of a sufficiently powerful group. Hence, unless constitutionally prohibited, governmental intervention occurs as soon as such a group emerges—a development that may have nothing to do with market failure. Thus, redistributive objectives of the powerful is often conducive to suboptimal political-economic resource allocation.

Appendix

The solution to the polycentric $(g + n)$ person simple bargaining problem.

Let

$$\Gamma(U; t^o) = \prod_{i=1}^n [U_i - t_i^o] \prod_{j=1}^g [U_j - t_j^o];$$

then the solution of the polycentric $(n + g)$ -person simple bargaining game is obtained by maximizing $\Gamma(U; t^o)$ with respect to $x_0 \in X_0$, $\{c_i^j\}$, and $\{c_k^j\}$, given that universal reward strategies prevail because only the cooperative solution is considered. Since $\ln \Gamma$ is monotone increasing in Γ , maximizing

$$\ln \Gamma(U; t^o) = \sum_{i=1}^n \ln (U_i - t_i^o) + \sum_{j=1}^g \ln (U_j - t_j^o)$$

also maximizes Γ . Let the outer boundary of X_0 be given by $H(x_0) = 0$ and set the Lagrangian expression

$$L = \ln \Gamma(U; t^o) - \lambda H(x_0)$$

where λ is a Lagrangian multiplier. Assuming an interior solution, the first-order conditions (FOC) for maximum $\ln \Gamma$ are

$$(A.1.a) \quad \frac{\partial L}{\partial x_0} = \sum_{i=1}^n \frac{1}{(U_i - t_i^o)} \frac{\partial u_i}{\partial x_0} + \sum_{j=1}^g \frac{1}{(U_j - t_j^o)} \frac{\partial u_j}{\partial x_0} - \lambda \frac{\partial H(\bar{x}_0)}{\partial x_0} = 0$$

$$(A.1.b) \quad \frac{\partial L}{\partial c_i^j} = \frac{-1}{(U_i - t_i^o)} + \frac{1}{(U_j - t_j^o)} \frac{\partial s_{ij}(\bar{c}_i^j, \alpha_i^j)}{\partial c_i^j} = 0$$

$$i = 1, 2, \dots, n, \quad j = 1, 2, \dots, g$$

$$(A.1.c) \quad \frac{\partial L}{\partial c_k^j} = \frac{-1}{(\bar{U}_k - t_k^o)} + \frac{1}{(\bar{U}_j - t_j^o)} \frac{\partial S_{ij}(\bar{c}_k^j, \alpha_k^j)}{\partial c_k^j} = 0$$

$$k, j = 1, 2, \dots, g \quad k \neq j$$

where \bar{U}_j , \bar{U}_j , and \bar{U}_k are the values of the corresponding extended objective functions at the bargaining solution. Treating the values of \bar{U}_i , \bar{U}_j , and \bar{U}_k as given constraints, it is easily shown that maximizing $\Gamma(U; t^o)$ (i.e., finding the solution to the $(n + g)$ -person simple bargaining game) is equivalent to maximizing the following political governance function.

$$(A.2) \quad W(x_0) = \sum_{i=1}^n B_i u_i(x_0) + \sum_{j=1}^g B_j \mu_j(x_0)$$

with respect to $x_0 \in X_0$ where, from (A.1.a),

$$(A.3) \quad B_i = \frac{1}{\bar{U}_i - t_i^o} > 0 \quad \text{and} \quad B_j = \frac{1}{\bar{U}_j - t_j^o} > 0 \quad \text{for all } i \text{ and } j.$$

From (A.1.b) and (A.1.c), we also have

$$(A.4) \quad \frac{B_i}{B_j} = \frac{\partial S_{ij}(\bar{c}_i^j, \alpha_i^j)}{\partial c_i^j} \quad \text{and} \quad \frac{B_k}{B_j} = \frac{\partial S_{ij}(\bar{c}_k^j, \alpha_k^j)}{\partial c_k^j}$$

$$i = 1, 2, \dots, n, \quad j, k = 1, 2, \dots, g \quad j \neq k.$$

Equation (A.4) suggests a power theoretic interpretation of the weights in the political governance function; namely, the ratio B_i/B_j is the *marginal strength of power* of interest group i over political center j relative to a marginal increment in interest group i 's *cost of power* over policy center j . The ratio B_k/B_j is likewise interpreted in terms of the reciprocal power relationship between policy centers. Alternatively, the

weight ratios, B_i/B_j and B_k/B_j , may be interpreted as the corresponding groups' relative gains in the cooperative political-economic equilibrium compared to a conflict situation, i.e., $B_i/B_j = (\bar{U}_i - t_j^o) / (\bar{U}_i - t_i^o)$ and $B_k/B_j = (\bar{U}_j - t_j^o) / (\bar{U}_k - t_k^o)$ ($i = 1, 2, \dots, n$; $j, k, = 1, 2, \dots, g, j \neq k$).

Footnotes

¹See also Lukes (1987).

²Of course, other bases of power may be identified, but these will not be considered in the present discussion. For further detail, see Wrong (1988).

³The reaction of the unorganized but responsive groups is not necessarily a best reply strategy to the center's policy. In fact, group members' responses may be emotional and not rational (e.g., urban dwellers' riot in reaction to increased food prices). The only theoretical requirement is that group responses constitute predictable behavioral patterns.

⁴In a dynamic formulation, values of the instrumental variables are functions of historical and current values of the state variables. The analysis, which in the static version is performed in terms of the instrumental variables, will have to be carried out in terms of policy parameters in the dynamic formulation. Alternatively, optimal control theory could be employed in dynamizing the political-economic structure.

⁵Policymakers ordinarily control other political resources as well. These have been ignored in the present analysis. However, their effects will, presumably, show up in the cost of power to interest groups.

⁶No inter-group comparability is implied by our definition of the objective functions. The definition of U_i 's in terms of a common numeraire implicitly assumes that members of each group are able to evaluate changes in the state of the political-economic system in terms of dollars and cents. This is a subjective value reflecting the group's own preferences. In political-economic systems this seems to be a plausible assumption.

⁷In polycentric political configurations, reciprocal power relations between different centers will give rise to extended objective functions comprising all three components [see the Appendix and Zusman and Rauser (1990b)].

⁸The term "economic efficiency" used here is not necessarily synonymous with overall Pareto optimality in the traditional economic sense.

⁹Of course, noncooperative behavior is quite common. However, it is much less frequent than cooperation and ordinarily arises when the parties in the conflict have divergent perceptions of their mutual power positions.

¹⁰It should be emphasized that a threat need not be carried through. In fact, it need not be at all explicit. All that is required is the perception of a potential threat by the participants. See Nagel (1968).

¹¹See Harsanyi (1963, p. 215). The conditions are stated in terms of the notation adopted in the present study.

¹²A first attempt at developing a dynamic theory of political-economic processes is made in Zusman and Rausser (1990b). The attempt strongly suggests a crucial relationship between the political-economy's dynamical behavior and its economic efficiency.

¹³There exists a voluminous and rapidly expanding literature on transaction cost economics. See, for instance, Coase (1960) and Williamson (1975, 1979). The definition and role of transaction costs in shaping organizational forms are discussed in Zusman (1988, pp. 68-72).

¹⁴Strictly speaking, the subsidy cost does not fully represent taxpayers' preferences as it abstracts from the tax excess burden. Hence, to serve as a faithful representation of taxpayer preference, we should have

$$u_0(s) = -sq(s) (1 + \epsilon),$$

where $\epsilon > 0$ is the marginal rate of tax excess burden in the economy.

¹⁵Kreuger cites an estimated deadweight loss of 7.3 percent of GNP in India in 1964 due to import licenses alone. The corresponding loss in Turkey in 1968 was estimated at 15 percent of GNP (Krueger, 1974, p. 294).

¹⁶See, for instance, Buchanan and Tullock (1962). Constitutional choice in cooperative enterprises is discussed in Zusman (forthcoming). While Zusman's analysis is more narrowly focused, certain elements of his approach may be extended to political-economies.

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