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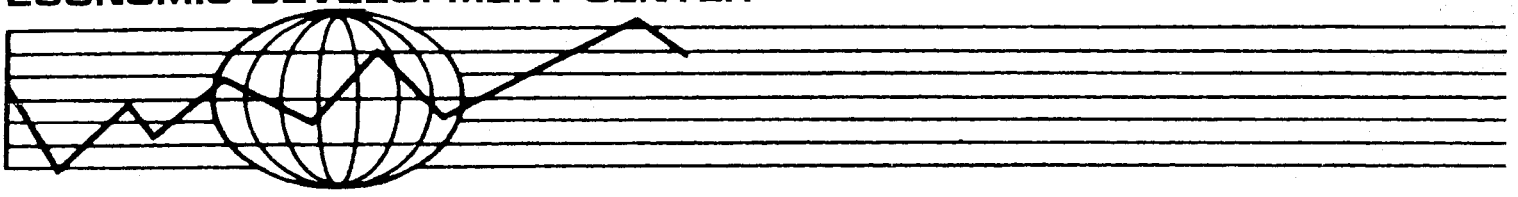
Bulletin Number 88-1

February, 1988

ECONOMIC DEVELOPMENT CENTER



AN OPEN ECONOMY MODEL OF POLITICAL INFLUENCE AND COMPETITION AMONG RENT SEEKING GROUPS

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by

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This research was supported by the Economic Research Service, Agriculture and Trade Analysis Division.

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Abstract

The paper develops a formal model of government's economic decisions as influenced by private agents within the context of neoclassical political economy. The government is assumed to form preferences over interest groups in the economy; in turn these preferences are influenced by the rent seeking behavior of these groups. An open, two-household, two-sector general equilibrium model is constructed to depict an environment in which preference-maximizing (rational) individuals allocate otherwise productive labor to directly unproductive rent seeking activities in order to exert political pressure on the government's choice of policy instruments. With the aid of five comparative-static experiments, the game-theoretic component and the second-best nature of the rent seeking environment is discussed. Insights are also provided on the influence of technological change, and changes in lobbying efficiency on resources allocated to rent seeking by interest groups. Key words: Rent Seeking, Political Economy, General Equilibrium.

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I. Introduction

Under conditions that preclude market failure and allow for the possibility of lump sum income transfers, Buchanan (1980, p. 14) summarizes the public choice view of this role: "As long as governmental action is restricted largely, if not entirely, to protection of individual rights, person and property and enforcing voluntarily negotiated private contracts, the market process dominates economic behavior and ensures that any economic rents that appear will be dissipated by the force of competitive entry." Unfortunately, lump sum income transfers are seldom feasible and the conditions that give rise to market failure (externalities, public goods, risk and information asymmetries) are common. Whenever these conditions prevail collective action can give rise to an increase in welfare. However, recent studies of country adjustments to world economic shocks (e.g., Balassa, 1982, 1986, among others) provide strong empirical evidence that government interventions have been inimical to the growth process in many countries.

This experience raises several questions. Why have some countries persisted in their pursuit of interventions that exacerbated adjustments to external shocks and were wasteful of resources? Are these interventions intended for the overall benefit of their respective economies but, in reality, a sequence of policy mistakes? Or, are interventions the outcome of political pressure exerted by domestic interest groups seeking to achieve outcomes which might be favorable to them but are, nevertheless, socially wasteful of resources? If the former were the case, why have countries failed to learn from these mistakes?

Lucas (1986), and others (Romer 1986, Prescott and Boyd 1987),have recently investigated the possibility that the level and rates of the disparate growth in per capita income among the world's economies lies in how society, acting collectively, addresses problems of market failure attributed to externalities and public goods. In this context, is it possible that efforts of individuals or groups to seek their differential advantage lead to government interventions that distort market signals, induce an inefficient allocation of resources in the private sector, as well as underinvestment and inadequate controls in areas where markets otherwise function poorly to optimally allocate society's resources? Moreover, if intervention is pervasive, it is not surprising to find (as is shown in the simple model developed in this paper) that our ability to understand private sector choices is limited because these choices are interdependent with the policy rules of government and with the choices of other groups in society that are also seeking their differential advantage?

We omit a discussion of the nature and apparent motivation of government intervention that has been observed to occur in numerous countries[1]. Instead, a brief overview of selected "informal" theories of government behavior is presented. This review serves to motivate the development of a model of rent seeking households with endogenous government behavior. Some implications of the model conclude the paper.

II. Overview Of Informal Theories Of Government Intervention

Insights into the motivation for government intervention are provided

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[1]For a review of some of this literature, see Terry Roe and Mathew Shane (1986), "Government in the Process of Trade and Development," paper presented at the meetings of The International Agricultural Trade Research Consortium, CIMMYT in Mexico, December 15, 1986.

in a growing body of literature that Colander (1984) termed neo-classical political economy. The key strands of this literature are distinguished by the more "informal" theories of the political science school typified most recently by Bates (1983), on the behavior of governments in East Africa, and by Mancur Olson (1982), on distributional coalitions and the free rider problem. "Formal" theories have evolved from the public choice school (e.g., Buchanan and Tullock 1980), and the field of trade and development where emphasis is placed on rent seeking (Krueger 1974) or, as Bhagwati (1982) has suggested, on directly unproductive profit seeking (DUP) activities. The various approaches have involved tariffs versus quotas as rent seeking instruments, Bhagwati and Srinivasan (1980), rent seeking and rent avoidance, Appelbaum and Katz (1986) and, more recently, an approach which permits the regulators of instruments to induce rent seeking, Appelbaum and Katz (1987).

Our approach bears a resemblence to the problem considered by Appelbaum and Katz (1987), but we adapt the framework developed by Becker (1983) and cast our problem in an economy-wide general equilibrium context. While the model is simple, it illustrates many of the issues identified in the informal theories.

Bates (p. 169) views public policy as "the outcome of political pressures exerted by members of the domestic economy seeking their own interests". In the case of developing countries, he argues that urban consumers are potent pressure groups demanding low priced food. They have political influence because of their geographical concentration and strategic location. They can quickly organize and they are largely employed in providing public services so they can, with relative ease, impose deprivation on others. Bates notes that urban unrest forms a significant prelude to changes of governments in Africa.

Interests of urban consumers coincide with those of domestic industrialists who view low priced food as serving to decrease the pressure on wages. The industrialists also are effective in obtaining protection from imports because of the notion that the key to development lies in industrialization. Furthermore, since industrial goods account for a small share of most households' budgets in LDC's, import protection of industrial goods will not have a large direct impact on expenditures of most households. The outcomes are policies which tend to support both import substitution and low cost food to urban households.

The same argument applies to developed economies. In advanced stages of development, the food share of the consumer's budget declines so that consumers become less sensitive to increases in food prices. Agriculture becomes a smaller component in the total economy and farmers tend to be more specialized. Within their area of specialization, they are better able to organize than are urban groups. Moreover, with food a small share of consumer's expenditures, protection demands in agriculture can be met at lower political cost, with the result that the agricultural sector receives protection relative to the industrial sector[2].

While these arguments provide insights into the motivation for interventions, why do governments prefer to intervene in markets which perform relatively well if left alone when they could accomplish the same objectives in areas where markets function poorly? Bates argues that market interventions facilitate the allocation of political rents. Market interventions permit governments to target the allocation of subsidies

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[2]Hayami and Honma (1985) and Anderson (1983, 1985) provide some empirical support for this general view and extend it to explain why policy regimes in developed countries tend to protect agriculture and regimes in developing countries tend to tax agriculture.

through control of marketing functions while, at the same time, transferring resources to supporters (civil servants) engaged in carrying out these interventions. In Bates's terminology, market interventions facilitate the "organization of the rural constituency" who support the government and to "disorganize the rural opposition".

Similar to Bates, Olson focuses attention on the formation of special interest groups into coalitions and their role in obtaining a differential advantage through lobbying activities. Important among the inferences he draws are that (a) broad based coalitions tend to take into account the adverse macroeconomic effects of their lobbying efforts so that the adverse effects of the differential advantage they seek tends to be less than those of narrow-based coalitions, and (b) narrow based coalitions tend to be more interested in the distribution of society's income to members of the coalition since resources to expand societies output have to be shared with the rest of society while the benefits of the same resources spent on redistributing society's output in its favor accrue entirely to the group[3].

Next, we develop a simplified model of endogenous government behavior with rent seeking households. The literature on DUP or rent seeking activities offers a point of departure for our approach[4]. While abstract and necessarily narrow in illustrating certain aspects that might motivate intervention, the model nevertheless captures some of the insights provided

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[3]See Olson, Chapter 9, p. 203-205. Pryor (1983,1984) attempted to obtain empirical support for theoverall implication of Olson's theory, namely that economies characterized by broad based coalitions should out perform economies characterized by narrow based coalitions. Pryor (p. 174) concludes that " ... Olson's theory is formulated in a manner still too general to prove successful in the empirical tests..."

[4]An earlier review of this literature can be found in Bhagwati. A more recent review and some extensions also appear in Colander.

by the informal theories as well as some of the questions raised in the introduction to this paper.

III. A Model Of Rent Seeking With Endogenous Government Behavior

Consider the case of a two-good, two-household rural-urban economy that cannot affect its external terms of trade. The government in this economy is assumed to announce prices (P_a, P_n) of the rural and urban goods respectively and then to engage in domestic and foreign trade until markets clear[5]. Households are permitted to allocate a portion of their labor endowments to directly unproductive profit seeking activities, through lobbying, in order to influence the government's pricing decision in their favor.

Households' choices are defined by:

$$\underset{X_i}{\text{Max}} \quad V_i = V_i(q_{ai}, q_{ni})$$

subject to

$$(1) \qquad X_i = \{(q_{ai}, q_{ni}, L_i, I_i) \in R^+ \mid Y_i \geq P_a q_{ai} + P_n q_{ni},$$

$$L_i^* \geq \Sigma_j L_{ji} - I_i \text{ and } X_i \geq 0\},$$

where the index i, j = a (rural), n (urban) denotes households; $V_i(.)$ is the household's direct utility function of the standard neo-classical type; q_{ai} and q_{ni} are quantities of the rural and urban good consumed by the i-th household; L_i^* is the household's total labor endowment that is

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[5] In the context of this model, the domestic-world price relationship is $P_i = (1 + t_i)P_i^w$ where t_i is the tax or tariff rate. Hence, the choice of P_i implies $t_i = (P_i - P_i^w)/P_i^w$. It is easily shown that the results obtained from the model are invariant to the choice of P_i or t_i as instruments.

allocated to production activities in sectors j = a,n, and to lobbying or rent seeking activities (l_i). Hence, L_{ja} denotes the quantity of labor from the rural household's endowment that is allocated to production activities in the j-th sector. Y_i denotes the household income derived from production and wages. Assuming full employment,

$$(2) \qquad Y_i = P_i Q_i(L_i) - WL_i + W(L_i^* - l_i),$$

where L_i is the amount of labor employed in the production of Q_i at wage rate W; $\partial Q_i/\partial L_i > 0$ and $\partial^2 Q_i/\partial L_i^2 < 0$ is assumed.

A more general specification would consider a vector of inputs and expenditures, but this would unnecessarily complicate the model for purposes here. As Bhagwati (1982) has shown, the reallocation of inputs from production to lobbying and other activities which do not produce a good or service that yields utility may provide pecuniary returns to individual households, but it can be socially wasteful of resources. If the choice of l_n succeeds in inducing the government to increase P_n relative to P_a, then urban households can be made better off than the rural households that produce the rural good Q_a. Hence, in principle, a strategic interdependence exists between these households.

A. Household's view of political economy

Before households can choose l_i, they must form a hypothesis of the effect of lobbying on the government's choice of levels for the instruments P_a and P_n. In an attempt to formulate a formal expression for this "influence", we utilize Becker's (1983) concept of the "pressure function". Becker defines a function that relates inputs, including the number of members in the coalition, to the production of pressure. This specification accounts for the free rider problem of the large diverse coalitions discussed by Olson.

We omit the free rider component since there are only two households. We assume that households allocate labor to the production of political pressure in order to exert influence on politicians at the national level according to the following simple function:

$$(3) \qquad \pi_i = \pi_i(l_i;Z_i), \; i = a, \; n.$$

where $\partial\pi_i/\partial l_i > 0$ and $\partial^2\pi/\partial l_i^2 < 0$. The exogenous variable Z_i summarizes the state of the political economy that affects the efficiency of converting lobbying into pressure (π_i).

Pressure is assumed to influence the government's formation of preferences over households in the economy. We express the government's preferences in the following simple form:

$$(4) \qquad U = I_a V_a + I_n V_n + I_f V_f(R)$$

where V_a and V_n are the utility of rural and urban households defined above and, for our purposes here, V_f is the utility of an aggregate of next period households. The usefulness of this construction is discussed below.

The I_i are influence functions which define the government's preference ordering; they map the pressure from lobbying into influence[6]. These functions are:

$$(5) \qquad I_i = I_i(l_a,l_n,Z_a,Z_n,Z_o) = I_i(\pi_a,\pi_n,Z_o),$$

where the exogenous variable Z_o summarizes the state of the political

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[6]A more general formulation is $U(V_a,V_n;I_1) + U(V_f(R;I_2))$. However this complicates the specification of the properties of the influence functions I_j. Also, we recognize the possibility that the policy decision making process is likely to be polyarchial (as opposed to hieracrchial) with some units of government being more strongly influenced by some coalitions than others. Then, a single objective function will not capture the essence of political behavior. Instead, each decision making unit of government may too seek pecuniary gains subject to legal constraints.

economy that converts pressure into influence. They have the property:

$$I_a + I_n + I_f = 1,\ 0 < I < 1.$$

where I_f is predetermined. To guarantee that the set X_i is convex, we require that I_i be strictly concave in l_i.

The conversion of pressure into influence by rural households is not independent of the conversion of pressure into influence by urban households. That is, the political influence functions are not independent because influence of the urban household that raises the relative price of the urban good, imposes an implicit indirect tax on the rural household through their consumption expenditures on Q_n and it affects incomes through the labor market.

Thus, we require

(6) $$-\partial I_a/\partial \pi_i = \partial I_n/\partial \pi_i.$$

As Becker (1983, p.376) points out, since

(7) $$\partial^2 I_n/\partial \pi_n \partial \pi_a = \partial^2 I_n/\partial \pi_a \partial \pi_n,$$

an interdependence can exist between the households' marginal products of lobbying. If an increase in π_a raises the marginal product of π_n, $(\partial^2 I_n/\partial \pi_n \partial \pi_a > 0)$, then an increase in π_n would lower the absolute value of the marginal effect of π_a on I_n. Moreover, an increase in other exogenous variables that raise the influence of the i-th group, will lower the influence of the other group.

The budgetary consequence of the government's choices is given by:

(8) $$R = (1-P_n)(Q_n - \Sigma_i q_{ni}) + (P_a-1)(\Sigma_i q_{ai} - Q_a),$$

where world prices are assumed to be equal to unity. If the government chooses unit domestic prices, then R is zero and markets clear through

foreign trade. A choice of prices P_a and P_n that subsidize current period households (R negative) is simply treated as a lump sum claim on, or an income transfer, to next period households. Note also that current period households do not lobby for purpose of augmenting income from direct government budget transfers. Hence, this particular construction only permits the government's choices of P_a and P_n to effect current period markets.

The decision rules for determining the instruments P_a and P_n can, in principle, be obtained by assuming that the government chooses the level of its instruments as though it sought to maximize the objective function. Domestic prices then can be expressed in terms of the following pricing rules:

$$(9) \qquad P_a = P_a(I_a, I_n; Z^*)$$

$$(10) \qquad P_n = P_n(I_a, I_n; Z^*),$$

where

$$Z = (I_f, L_a^*, L_n^*, Z_a, Z_n, Z_o, P_a^w, P_n^w),$$

is a vector of exogenous variables including world prices, P_a^w and P_n^w, of rural and urban goods respectively. It is shown in the appendix that, essentially, if the government's preference weights are equal across households, domestic prices are equated to world prices. Hence, by construction, the model does not restrict a free trade outcome.

B. The interdependence and game component of the problem

Assuming that households correctly perceive the objective of government, equation (4); know the political process through the influence functions (5); and the technology reflected in the pressure functions (3); equations (9) and (10) can be substituted into the households' budget constraint (1):

$$(1') \qquad P(l_a, l_n; Z^*)Q_i(L_i) + W(l_a, l_n; Z^*)(L_i^* - L_i - l_i) = P_a(l_a, l_n; Z^*)q_{ai} + P_n(l_a, l_n; Z^*)q_{ni}$$

where, assuming full employment, the labor wage rate $W(l_a, l_n; Z^*)$ is given by the market clearing condition:

$$\Sigma_i L_i = \Sigma_i (L_i^* - l_i).$$

Notice that the wage rate is directly influenced by lobbying which decreases the amount of labor available for production. Hence, we obtain the familiar result of other rent seeking models, namely, as resources are withdrawn from production and allocated to rent seeking activities, production possibilities are reduced.

It is easily shown that, conditional on the j-th household's lobbying activities, the i-th household allocates time to lobbying activities to the point where marginal gains from lobbying are equal to the wage rate and to the marginal value product of production:

$$(11) \qquad (\partial P_i/\partial l_i)Q(L_i) + (\partial W/\partial P_i)(\partial P_i/\partial l_i)[L_i^* - L_i - l_i]$$

$$-(\partial P_a/\partial l_i)q_{ai} - (\partial P_n/\partial l_i)q_{ni} = W(l_a, l_n; Z^*) = P_i \partial Q(L_i)/\partial L_i.$$

In order for the household to determine any of its choice variables, it needs to either know or assume the other household's level of lobbying activity (l_j). This is the interdependence nature of the problem[7]. From the implicit function theorem, the i-th household's choice can be expressed as:

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[7] Household utility can be expressed as: $V_i = V_i(l_a, l_n, Z^*)$,

$$q_{ai} = F_{ai}(I_j;Z^*) = q_{ai}(P_a,P_n,Y_i)$$

$$q_{ni} = F_{ni}(I_j;Z^*) = q_{ni}(P_a,P_n,Y_i)$$

$$L_i = F(I_j;Z^*) = L_i(P_i,W)$$

$$I_i = \Gamma_i(Ij;Z^*) = I_i(P_a,P_n,Y_i),\ i \neq j = a,\ n.$$

These results suggest that in economies where intervention is extensive, identification of the households decision rules may well need to take into account the manner in which households influence policy decisions. Efforts to estimate the parameters of the RHS functions when P_i are treated as exogenous will likely not identify the true parameters since the P_i are jointly determined with the I_i. Further complications may arise because the parameters of these functions are likely to change as households learn of the other's reaction function.

IV. A Numerical Illustration

Next, we provide a numerical illustration of the general equilibrium interactions involved in an economy engaged in rent seeking. We assumed the following initial conditions: $L_a^* = 6.0$; $L_n^* = 5.5$; $I_f = 0.33$ (and hence, current households compete for the remaining 0.667 units of government influence, equation 4). World prices were set to unity.

The functional forms selected for the households' utility and production functions are Cobb-Douglas. Hence, the indirect utility function for the i-th household is of the form:

$$V_i = \alpha^{\alpha}\beta^{\beta}(P)^{-\alpha}(P)^{-\beta}(\Pi_i + W(L_i^* - I_i))$$

where Π_i is the indirect profit function associated with production activities of the i-th household and α and β are coefficients of the direct utility function.

The functional forms chosen to satisfy the properties of the influence

functions (5) are:

$$(5') \qquad I_n = C - C/(\exp(l_n/l_a)),\ I_a = C/(\exp(l_n/l_a))$$

where the constant $C = 1 - I_f$.

It can be observed from inspection of the first derivates of the influence functions with respect to l_i that the urban households have a "political advantage" in lobbying over the rural household, i.e., the marginal product of urban household lobbying is greater than the marginal product of rural household lobbying. This asymetric treatment was used to illustrate the differential advantage that one group may have (because of proximity to cities, bureaucracy etc.) over another interest group.

A. Effect of the lobbying activity

A solution to our hypothetical economy without rent seeking activities appears in the first column of Table 1. Influence weights were assigned evenly between the two households, each at 0.333. Domestic prices of unity clear markets and trade is in equilibrium in real terms. Parameters were chosen so that rural households would be deficit producers of rural goods; this will simplify latter exposition of rent seeking activity. The economy exports urban goods to meet the consumption needs of rural goods for both rural and urban households.

Column two of the table reports the results when the lobbying structure presented above was added to the model. The optimal solution to the model results in a urban household lobbying level of 0.434 units of labor. From equation (11), the real wage of 0.441 is the opportunity cost of the last unit of labor allocated to lobbying activity. Lobbying yields the government's influence weight I_n of 0.658 for urban households and a corresponding decrease in the rural household's influence weight, I_a, to 0.009. By construction, the rural household is a deficit producer of rural goods. Hence, it will not lobby for higher rural good prices since, as

equation (11) indicates, to do so would increase the cost of consumption relative to gains in income. To prevent division by zero in equation (5'), a lower bound of 0.1 was placed on the amount of labor that the rural household could allocate to lobbying activity. Alternatively, this formulation can be interpreted from the point of view of the urban household, i.e., as though the urban household is examining the implications to its choices of an exogenously given lobbying activity of the rural household.

Given these preference weights, the government sets the relative prices of P_n to P_a at 2.248. Consequently, the production of urban goods increased from 5.426 to 6.283 units while the production of rural goods declined from 3.052 units to 1.572 units. In world prices, the value of aggregate production decreased by 0.623. The real wage rate increased from 0.369 to 0.411 due to the withdrawal of productive labor to lobbying and an increase in the value marginal product associated with an increase in the relative price of the urban good. Employment in the urban sector increased and in the rural sector it decreased.

Consumption of urban goods decreased (from 4.239 to 3.491 units) and rural goods increased (from 4.239 to 7.85 units). For markets to clear at announced prices, exports and imports of urban and rural goods increased which resulted in a nominal government budget deficit of 3.486. In the context of this model, the deficit is a claim on the income of next period's households.

The nominal income of both rural and urban households increased. The nominal increase in rural household's income results from increased wages associated with the increase in relative prices. Of course, the total labor employed in the productive sectors of the economy has declined by the amount of labor allocated to lobbying (0.534 units). Despite the higher nominal income of rural households, they were made worse off in real terms,

Table 1: General Equilibrium of the Economy Before and After Rent-Seeking Activities*

	Before Rent-Seeking	After Rent-Seeking
Labor Allocated to Lobbying:		
Urban household	0.000	0.434
Rural household	0.000	0.100
Influence weight of		
Urban household	0.333	0.658
Rural household	0.333	0.009
Domestic price ratio (P_n/P_a)	1.000	2.248
Real wage rate	0.369	0.441
Labor employed in		
Industry	7.360	9.868
Agriculture	4.140	1.098
Real Production in		
Industry	5.426	6.283
Agriculture	3.052	1.572
Nominal household income		
Urban	5.28611.396	
Rural	4.167	5.340
Household utility		
Urban	2.370	3.565
Rural	1.869	1.670
Industrial Real Exports	1.187	2.792
Agricultural Real Imports	1.187	6.278
Government Revenues from Trade	0.000-3.486	

*Solutions were obtained using GAMS (General Algebraic Modeling System), a MINOS based software that was largely developed by the World Bank.

suffering a decline in utility from 1.869 utils to 1.670 utils. The utility of next period households declined substantially, since the revenues from trade (-3.486) is a claim on the income of future period housholds[8]. Hence, the result of the induced lobbying activity of urban households was for the government to tax rural and future period households.

B. Comparative static experiments

Five experiments were performed to highlight the comparative static implications of the model. Table 2 summarizes the qualitative results where comparisons are made relative to the solutions reported in column two of Table 1[9].

1. Increase rural household lobbying. In this experiment, the lower bound on the endogenous variable l_a, rural household lobbying, was increased from 0.1 to 0.2 units of labor and the model was resolved (column 1, table 2). We first observe that the result predicted by equation (7) occurs, namely, increased lobbying activities of the rural household increased the marginal product of lobbying of the urban household, evaluated at previous lobbying levels. Consequently, the urban household was induced to increase its lobbying activity. The net result was to increase the influence of the rural household (I_a) relative to the influence (I_n) of the urban household in spite of the increased lobbying efforts of the urban household. Clearly, the influence of the urban household would have declined even further had it not attempted to counterveil the lobbying efforts of rural household. This key result is consistent with the observation of others (see for example,

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[8]That is, the economy is permitted a trade deficit which future households are obliged to repay.

[9]Since the results reported in column two of table 1 are for a distorted economy, second best implications can be drawn from a comparison of the experiments with the undistorted solution (column 1, table 1).

Srinivasan, 1985, p.57) that efforts to seek differential advantage induces other coalitions to do likewise and, therefore, to further increase the likelihood of decreasing the production possibilities available to the economy.

The increased influence of the rural relative to urban household induced the government to increase the price of the rural relative to the urban good. Thus, employment and production in the rural sector increased while employment and production in the urban sector decreased. With more labor allocated to lobbying activities, less labor was allocated to production activities with the net result that the real wage rate increased relative to that reported for the base solution in column two of Table 1. Foreign trade declined and the nominal income of rural and urban households also declined because the gain in revenues from increased agricultural activity was not sufficient to overcome the change in relative prices and the loss of wage income received by the rural household.

2. Increase in the influence (I_f) of future households. In this experiment, I_f was increased to 0.38, otherwise, all other parameters remained at levels consistent with the base solution reported in column 2, Table 1. An increase in I_f decreases the value of the parameter C in equation (5'). Since $\partial^2 I_n / \partial l_n \partial C$ is positive, a decrease in C decreases the marginal effect of l_n on I_n; essentially, increasing I_f reduces the "marginal effect" (or efficiency) of a given increase in urban lobbying on the price of the industrial good, P_n.

There are two key results. First, the decline in the efficiency of urban lobbying to influence the price of the industrial good induced urban households to decrease the amount of labor they allocated to lobbying activity. Consequently, the influence of the rural household increased relative to the influence of urban household.

Table 2: Summary of Experiments: Relative Changes with Respect to the Base-Run Reported in Column 2 of Table 2)

	Experiment				
	Increase				Reduce
	Rural Lobbying	Influence of Future h.h.	Tech. Eff. in Prod. of Urban Gd.	Tech. Eff. in Prod.of Rural Gd.	Political Eff. of Urban Lobbying
Labor In Lobbying					
Urban h.h.	+	-	+	-	+
Rural h.h.	+	n.c.[1]	n.c.	n.c.	n.c.
Influence Weight of					
Urban h.h.	-	-	+	-	-
Rural h.h.	+	+	-	+	+
Price Ratio (P_n/P_a)	-	-	-	+	-
Real wage rate	+	-	+	-	-
Labor employed in					
Industry	-	-	+	-	-
Agriculture	+	+	-	+	+
Real Production in					
Industry	-	-	+	-	-
Agriculture	+	+	-	+	+
Nominal Income					
Urban h.h.	-	-	+	-	-
Rural h.h.	-	-	+	+	-
Household utility					
Urban h.h.	-	-	+	+	-
Rural h.h.	-	-	+	+	-
Indust. Real Exports	-	-	+	-	-
Agric. Real Imports	-	-	+	-	-
Gov. Rev. from Trade	+	+	-	+	+

1) n.c. = no change

The second key result is that the government was induced to lower the absolute level of rural and urban good prices. However, the lower relative influence of urban households yielded a larger absolute decrease in the price of the urban good than in the price of the rural good. Consequently, while exports and imports declined, a budget surplus was generated (i.e., a trade surplus) so that future households obtained an income transfer where the urban household made a larger contribution to the transfer than did the rural household.

Accordingly, employment in the agricultural sector increased, but the decline in price and the increase in labor allocated to production activities gave rise to a decline in wages. The fall in real imports exceeded the increase in real agricultrual production, and hence, real agricultural absorption decreased, causing a decline in the level of rural household utility. Overall, the increase in I_f had a deflationary effect on the current period economy.

3. Increase technical productivity in the production of industrial goods. In this experiment, productivity of the industrial good was increased in a Hicks-neutral manner by one percent. An increase in technical efficiency will increase the marginal product of labor in the production of the this good, which in turn, should increase the opportunity cost of lobbying, equation 11. However, the derivative of (11) with respect to an increase in productivity (e.g., by increasing the multipicand, say the parameter A_n, in a Cobb-Douglas production function) is positive in sign if $\partial^2 P_n / \partial l_n \partial A_n$ is positive in sign. Hence, it is possible that an increase in technical efficiency will induce the urban household to increase the amount of labor it allocates to lobbying in spite of the higher opportunity cost. However, with increased supplies of the industrial good, maintenance of the previous level of subsidy must occur at a higher government budget outlay and hence a larger claim on the incomes of future households.

These are the key results of this experiment. While the absolute values of prices increased, the relative price of the industrial good has fallen. The decline in the relative price of the industrial good was akin to a terms of trade effect; as industrial production increased, the abundance of the industrial output placed downward pressure on its relative price. In the meantime, however, the increasesd technical efficiency also increased the marginal productivity of labor in urban lobbying activities with the end result that the urban household increased the amount of labor allocated to lobbying. This result can also be interpreted as an attempt on the part of the urban housheold to countervaeil the tendency of the terms of trade to turn in favor of agriculture.

Further insights into this result can be seen as follows. Clearly, $\partial^2 Y_n/\partial P_n \partial A_n$ is positive. Hence, increased technical efficiency served to increase the "marginal product" of an increase in the output price of the industrial good. At the margin, it was therefore in the household's interest to increase its lobbying efforts to seek a marginal increase in their influence on the government's preference weights (and thus an increase in P_n as compared to the base solution) in spite of the fact that this increase occurs at the expense of withdrawing additional labor from production at marginally increased wages.

The increased lobbying by the urban household induced an increase in the price of the urban good. This increase implies an increase in the Government's budget deficit. Since the influence of the rural household has declined and the influence of next period households was fixed, the government chose to increase the price of the rural good to compensate for the otherwise larger increase on the claim of next period household income implied by the increased deficit. The result was an overall increase in the absolute levels of both prices. However, rural incomes increased in real terms because real wages increased due to the increased productivity of

labor in industry and also due to the increase in the amount of labor allocated to lobbying. This increase in income more than compensated for the increase in the price of the rural good. Overall, the effect of technical change was to make current period households better off and future households worse off.

A more general implication of this result is that in an environment where households can choose between lobbying for public investment in activities which increase productivity or activities wich increase output price, it seems likely that the optimal choice may well be to increase output price. In this case, the returns to lobbying accrue primarily to the sector. Otherwise, the returns to lobbying occur outside the sector, largely depending on the price and income elasticity of demand for the sector's output.

4. Increased technical productivity in the production of rural goods. In this case, Hicks-neutral technical efficiency in the production of the rural good was increased by one percent. While the productivity of rural household lobbying was increased, it was still not rational for the rural household to lobby (i.e., the shadow price of lobbying to the rural household remained negative but, relative to the base solution, smaller in absolute value). In terms of the urban household, an increase in the marginal product of rural household lobbying decreases the marginal product of lobbying by the urban household (equation 7). Hence, the urban household decreased its lobbying effort and, at the margin, saved on its wage and consumption expenditures. This is the key result of this experiment.

The decreased lobbying by the urban household increased the influence of the rural household. While the technical change effect served to increased employment and output in the rural sector, a decline in the relative price (P_n/P_a) with an increase in labor supply would have deceased real wages and, since the industrial sector is a source of wage income for

the rural household, rural incomes would have been adversely affected. Consequently, with an increase in the relative influence of the rural household, the government chose: (i) to decrease absolute prices but (ii) to increase relative prices. The decline in absolute prices decreased the claim on the income of next period households, relative to the base solution. The production of the urban good declined because P_n/W declined relative to the base solution, and hence the urban household was made marginally worse off.

This experiment reinforces the notion that rent seeking depends critically on the possible rewards available to households as determined by the marginal increase in its welfare from changes in the parameters of its optimization problem, net of the resources the household must expend to induce those who can influence these parameters. The amount of resources that must be expanded, in the context of this type of a model, increase as the welfare of others included in the government's preference function decreases. For example, the rural household might have been made better off if opportunities existed for it to lobby directly for an increase in real wages, although an increase in wages would have placed downward pressure in the income of the urban household since, in the context of this model, it is a deficit supplier of labor to the production of urban goods.

In the next comparative static experiment, we investigate the consequences of increasing the lobbying efficiency of the rural relative to the urban household.

5.Reduce the political efficiency of urban lobbying. As mentioned above, our choice of the functional form (5') for the influence functions implicitly assigns a larger influence weight to urban lobbying activities as compared to equal levels of rural lobbying. In this experiment, the "policitcal advantage" of the urban household is reduced by interchanging the influence functions so that the rural household has the implicit

political advantage while the urban household maintains a technological advantage in the production of the industrial good.

The key result is predicted by equation (7); the increase in the political advantage of the rural household induced the urban household to allocate more labor to lobbying activities as though it sought to counterveil the tendency of I_n to fall. Thus more labor was withdrawn from productive activities. However, in equilibrium, the increased urban lobbying fell short of compensating for the decline in their influence I_n; and hence the relative price turned in favor of agriculture as I_a increased. Consequently, employment and production in the urban sector declined as labor was allocated from the technologically more efficient sector to the relatively backward rural sector. The marginal physical product of labor declined and hence the real wage rate also declined.

The decline in imports exceeded the decline in exports so that the foreign trade performance of the economy improved relative to the base solution, column 2, table 1.. This result implies a decline in the absorbtion capacity of the economy and hence, current period household utility declined.

In general, this experiment highlights the second best nature of the problem. Accordingly, in an environment where DUP activities have been institutionalized, exogenous interferences or barriers which have the effect of reducing the "efficiency" of lobbying may as well result in a further increase in rent seeking activities and lead to increased wastage of resources. The interesting question then remains: in such an environment would an optimal polcy be one of making the rent seeking process as efficient as possible so that only a small fraction of productive labor would be lost to such activities?. In general, what would be the optimal polciy achived in a political economy in which DUP activities have been institutionalized?

V. Other Implications

The essential characteristic of the phenomena of DUP activities depicted in this framework is that an environment exists where it is rational for individuals to allocate resources in search of pecuniary returns. The resources so allocated do not produce a good or service that enter the utility of others so that the production possibilities available to an economy are reduced. In the context of the above model, if the rent seeking activity of the urban household yields more influence than the rent seeking activity of the rural household, then a possible outcome is for the rural household to be taxed ($P_a < 1$), the urban household to receive a net subsidy ($P_n > 1$) and for the government to incur a negative trade balance ($R < 0$) implying claims on the income of next period households. In a broder context, a country may also experience a decline in foreign exchange earnings and mounting foreign indebtness.

Depending on the specification of the influence functions, the DUP activities of rural households can increase the profitability of countervailing DUP activities of urban households. Hence, an environment that induces the seeking of differential advantage of one group can indirectly induce DUP activities by another group whose welfare is affected by the activities of the former group[10]. This behavior may or may not reduce the total value of goods and services produced in the economy[11].

Countries that pursue inward oriented strategies maintain elaborate administrative systems for resource allocation. These systems, often

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[10]The implication is that $\partial^2 I_i / \partial l_a \partial l_n > 0$.

[11]DUP activities in these models can be welfare improving if the initial point of departure is from a distorted economy as in the case of Krueger's pioneering article.

characterized by state owned enterprises, include quantitative restrictions on imports and exports, licensing of investment in typically import substitution activities, controls on foreign investment, and numerous other instruments to influence incentives (tariffs, taxes and subsidies). An implication of the theory on DUP activities is that the mere presence of these elaborate structures can be expected to generate more resource wastage than would be expected from an open trade strategy.

To capture the dynamics of the political economy discussed by Bates and Olson, the model outlined above will need considerable respecification along the lines of the economic growth models that are common in the literature. They can be adapted to capture the type of political economy described here. However, a more complicated task will be to capture the dynamics of the political process.

The above model treats government in a very simplified hierarchial structure. To capture the presence of other political parties, the polyarchial nature of most government decision making structures, and the presence of government enterprises, considerable work obviously remains. It appears that these problems are sufficiently complex that a family of models might be required, with each focusing a limited dimension of the problem.

APPENDIX

The First Order Conditions to The Government's Optimization Problem

Given, $Y_i = \Pi_i(P_i,W) + WL_i^+$ where, $L_i^+ = L_i^* - l_i$, Π_i is the indirect profit function and

$ES = (Q_n - q_{na} - q_{nn})$ denotes excess supply.

$ED = (q_{an} - q_{aa} - Q_a)$ denotes excess demand.

Assuming full employment, equilibrium in the labor market is given by:

$$\Sigma_i L_i^* - \Sigma_i L_i - \Sigma_i l_i = 0,$$

Hence, $W = W(P_a,P_n)$.

Assuming an interior solution, the derivatives of (4) with respect to the policy instruments P_a, P_n are:

$$\partial U/\partial P_a = I_a(\partial V_a/\partial P_a + \partial V_a/\partial Y_a(\partial Y_a/\partial P_a)) +$$
$$I_n(\partial V_n/\partial P_a + \partial/V_n/\partial Y_n(\partial Y_n/\partial P_a)) +$$
$$I_f(\partial V_f/\partial Y_f(\partial R/\partial P_a)) = 0.$$

$$\partial U/\partial P_n = I_a(\partial V_a/\partial P_n + \partial V_a/\partial Y_a(\partial Y/\partial P_n)) +$$
$$I_n(\partial V_n/\partial P_n + \partial V_n/\partial Y_n(\partial Y_n/\partial P_n)) +$$
$$I_f(\partial V_f/\partial Y_f(\partial R/\partial P_n)) = 0.$$

For i, j = a, n,

$$\partial Y_i/\partial P_j = \partial \Pi_i/\partial P_j + \partial \Pi_i/\partial W(\partial W/\partial P_j) + (\partial W/\partial P_j)L_i^+,$$

in which case, for i = j

$$\partial Y_i/\partial P_i = Q_i - L_i\partial W/\partial P_i + (\partial W/\partial P_i)L^+, \text{ and}$$

$$\partial Y_i/\partial P_j = -L_i(\partial W/\partial P_j) + (\partial W/\partial P_j)L_i$$

for $i \neq j$.

Let $\lambda_i = \partial V_i/\partial Y_i$ (i.e., the marginal utility of income). Multiply each i-th component of the RHS of the above FOC conditions by (λ_i/λ_i) and define $W_i = \partial W/\partial P_i$. Then, the above conditions can be stated as:

$$\partial U/\partial P_a = \lambda_a I_a(-q_{aa} + Q_a - L_a W_a + W_a L_a^+) +$$

$$\lambda_n I_n(-q_{an} - L_n W_a + W_a^+ L_n) +$$

$$\lambda_f I_f(\partial R/\partial P_a)=0.$$

$$\partial U/\partial P_n = \lambda_a I_a(-q_{na} - L_a W_n + W_n L_a) +$$

$$\lambda_n I_n(-q_{nn} + Q_n - L_n W_n + W_n L_n^+) +$$

$$\lambda_f I_f(\partial R/\partial P_a) = 0.$$

where:

$$\partial R/\partial P_a = (q_{an} + q_{aa} - Q_a) + (P_a - 1)\partial ED/\partial P_a + (1-P_n)\partial ES/\partial P_a.$$

and

$$\partial R/\partial P_n = - (Q_n - q_{na} - q_{nn}) + (1-P_n)\partial ES/\partial P_n + (P_a - 1)\partial ED/\partial P_n.$$

Suppose $I_a = I_n = I_f$. And, to simplify the problem, assume equality of the marginal utility of income, i.e., $\lambda_a = \lambda_n = \lambda_f$. Then it can be shown that the prices chosen by government are equal to world prices. The above conditions reduce to:

$$\partial U/\partial P_a = (-q_{aa} + Q_a - L_a W_a + W_a L_a^+) +$$

$$(-q_{an} - L_n W_a + W_a L_n^+) +$$

$$(Q_a - q_{aa} - q_{an}) + (1-P_n)\partial ES/\partial P_a +$$

$$(P_a - 1)\partial ED/\partial P_a = 0.$$

$$\partial U/\partial P_n = (-q_{na} - L_a W_n + W_n L_a) +$$

$$(-q_{nn} + Q_n - L_n W_n + W_n L_n^{+}) +$$

$$(q_{nn} + q_n - Q_n) + (P_a - 1)\partial ED/\partial P_n +$$

$$(1 - P_n)\partial ES/\partial P_n = 0.$$

Notice that these conditions reduce to:

(a) $\quad (1 - P_n)\partial ES/\partial P_a + (P_a - 1)\partial ED/\partial P_a = 0.$

(b) $\quad (P_a - 1)\partial ED/\partial P_n + (1 - P_n)\partial ES/\partial P_n = 0.$

Suppose $P_n = 1$. Then, in the case of (a), it is obvious that $P_a = 1$. The same result applies for (b). Since ES and Ed are homogeneous of degree zero in prices, it follows from Euler's theorem that $P_a(\partial ES/\partial P_a) + P_n(\partial ES/\partial P_n) = 0$. Hence,

(b') $\quad (1 - P_n)\partial ED/\partial P_a) + (P_a - 1)\partial ES/\partial P_n = 0.$

and thus, $P_n = 1$ and $P_a = 1$.

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