

COMPETITION, MONOPOLY, and POLITICAL CAPTURE

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Abstract

This paper develops a theory of politically-active monopoly, which trades political support to the government in exchange for political favors that increase its profit. Because a larger size means a greater ability to extend support, it also means a greater ability to capture political favors. Thus the monopoly here sets output above the level where marginal cost equals marginal revenue and may produce where price is less than marginal cost, since it faces a trade-off between political and market power. However, the size constraint on monopoly rent-seeking may remove its incentive to minimize cost and could even cause it to waste inputs. In addition, rent-seeking uses scarce resources that could be producing useful products, and the management team able to obtain the most efficient production may not be the management able to earn the highest profit, because efficiency in rent-seeking also counts. Thus while the monopoly here uses more resources than a conventional monopoly, it may still supply less output. However, if the government's political support is sufficiently sensitive to the cost of monopoly, we can expect a relatively optimistic outcome, in which the traditional "deadweight loss" triangle vanishes, although in general the resulting allocation of resources is no better than a second best.

Introduction

In nearly every type of society, large economic entities are active in political as well as in economic life, seeking subsidies, protection from competition, and other favors from government.

Thus, in order to gain and hold on to a protected market position, a firm may have to lobby and give political donations, as well as other kinds of political support, to politicians and government officials. To maintain its monopoly, a criminal gang may have to pay protection to a higher criminal authority, which suppresses its competition in return. These activities constitute “rent-seeking,” or efforts by economic decision-makers to obtain rents—returns to inputs over and above their opportunity costs—through the political process by bringing about changes in property rights.¹ The social cost of rent-seeking can include destruction of life or property and may eat up part or all of the rent obtained, although rent-seeking can also be productive.²

The other side of the coin is that a government creates exclusive claims to rent when and only when it expects to gain by doing so. Let an economic interest be any economic decision-making entity. Economic interests seek rent, the rights to which governments can often supply. Governments seek political support, which economic interests can often supply. This creates potential gains from trading political support for political favors. An economic interest will trade support to a government in return for political favors if and only if it expects this to cause a net increase in its rent, and a government will undertake this exchange if and only if it expects a net increase in its support.

In this context, the present paper develops a theory of monopoly that is active politically as well as economically, selling a product, but also trading political support for political favors that increase its profit. In the process, it engages in political capture, or in using its political influence to redistribute income, wealth, and other benefits to its advantage. Its capacity to influence government decisions—laws, rules, and their application—is a source of market power and profit.

But what determines political influence? While several factors play a role, Acemoglu and Robinson (1998) argue in a recent article that the *size* of an economic interest is often crucial. That is, size constrains leverage over political choices by constraining the political support that an interest can offer to a present or potential government.³ Since a larger size means a greater ability to extend support, it also means a greater ability to capture political favors that increase profit or other types of rent. In addition, A. & R. maintain that governments have a limited ability to commit now to future policy choices. An economic interest will therefore try to preserve its size into the future, in order to maintain its political and economic strength.

In this context, the ability of a monopoly or other economic interest to extend political support will depend on at least three kinds of political inputs:

(a). The resources it can mobilize for direct political action—rallies, demonstrations, parades, strikes, co-operation with the government or opposition to mutual advantage, publicity campaigns, volunteer support for office holders or electoral candidates, riots, passive resistance, etc.

(b). The number of voters who benefit directly from policies that raise its rent. This applies only when there is meaningful competition between political parties for votes and then only when an interest has more leverage over how its stakeholders vote than over the voting of the general public. A larger number of voter beneficiaries makes it more likely that an economic interest will control votes that are crucial to deciding election outcomes.

(c). The funds that it can raise to finance campaign contributions, bribes, and other political activities, as well as lobbying and efforts to sway public opinion directly.

Clearly, (a) and (b) above could be constrained by an economic interest's size. The same may be true of (c) if the interest finances political activities via dues or taxes on its members—for example, member firms in the case of a monopoly cartel—and/or the sale of private benefits to them, in order to get around the free-rider problem. As the size and diversity of the constituency represented by an economic interest increase, common ground becomes harder to find, and the free-rider problem in financing and promoting effective political action becomes greater. Thus the marginal benefit to an interest of growing larger will eventually disappear (Olson 1971, chs. II, V, VI), although when greater size is valuable, so is the ability to encompass greater numbers and diversity and still organize for effective political action.

In addition, voter preferences are more decisive in a democracy, while activities and publicity unfavorable to government are harder to suppress. The contribution of size to political influence may therefore be greater in democracies than in dictatorships, where rulers often rely on relatively small, but highly-organized and tightly-screened élites for support. The degree to which the central government constrains lower-level governments is also a factor. The number of voters who benefit from policies favorable to an economic interest may represent a tiny fraction of voters at the national level, but a significant share at a local or regional level.

In short, the political leverage of a monopoly or other economic interest depends on its size. Before proceeding to the theory of monopoly, we want to show how this idea might be incorporated into a simple, but general, model of political exchange and equilibrium.

Political Exchange and Equilibrium

Suppose that n economic interests find it profitable to be politically active, and initially, let the terms of trade in exchanging political favors for political support be given. Denote by S^k the political support available to the k th economic interest from (a), (b), and (c) above, for $k = (1 \dots n)$. S^k will depend on one or more measures of k 's size, and k is assumed to use any given S^k to maximize its expected long-run economic rent, π^k . To this end, it may support the present government or a political opposition that might become the government, or it may divide its support between two or more political entities. Efficient division then requires support to be allocated in such a way that an increase in S^k yields the same increase in π^k , regardless of which entity receives the increase in support.

Let G^t be the probability that a current government will be in power t time units from now. Then a constant probability over time, denoted by G , will exist such that this government is indifferent between the stream of probabilities, G^t , over all $t \geq 0$, and G , which we define to be its political support.⁴ G will depend on $(S^1 \dots S^n)$ and on the vector of policy values, $e = (e_1 \dots e_m)$, that this government is expected to adopt, as well as the allocation of each S^k between different political units. These policy values include different types of expenditure, tax/subsidy rates, and possible changes in other property rights, which are assumed to be quantifiable in some way. For each policy vector, e , there is assumed to be a specific, rent-maximizing size for every interest, k —and therefore a specific value, $S^k(e)$, of each S^k , such that $S^k = S^k(e)$ when every economic interest maximizes its rent—as well as a unique division of $S^k(e)$ between the current government and political opposition parties. Because of this, G becomes a function of e alone, and the government chooses e to maximize G .

The support vector, $(S^1 \dots S^n)$, helps to determine G , in part, because voters lack incentives to obtain costly information about the welfare implications of alternative policy vectors. Rarely does an individual vote decide an election, and most individuals can not hope to change government policy by themselves. This allows economic interests leeway to influence how people vote. In addition, voters may choose, not only on the basis of e , but also according to their perceptions of the leadership ability and other qualities of the government vs. the opposition. The governing party can gain if its leaders are perceived to be honest, sincere, capable, knowledgeable, good communicators, charismatic, able to respond efficiently to unforeseen emergencies or opportunities, etc., and if opposition leaders are perceived to lack these qualities. Economic interests can help to shape the image of a government, both through their own appeals directed to voters and by giving resources to the government to do this. One result is that G may be insensitive to economic costs imposed by politically-active interests.

The terms of trade in exchanging political favors for political support between the government and politically-active economic interests are determined as follows. Efficient exchange will maximize a function, $U(\pi^1 \dots \pi^n; G)$, increasing in G and in each π^k such that k is a party to this exchange, subject to a frontier of attainable $(\pi^1 \dots \pi^n; G)$. The common slopes of this frontier and of an indifference surface of U at the maximum of U then give the terms of trade in this exchange, which will reflect the bargaining leverage of government vis-à-vis each economic interest. An interest's leverage will depend on its ability to withhold support for a time—which requires it to forego political favors—while the leverage of government will depend on its ability to withhold political favors and do without an interest's support. An example of U is given below.

The size advantage plus the possible insensitivity of G to deadweight losses imply that U could be maximized by a policy

vector yielding a Pareto inferior allocation of resources. For example, an industry or profession may be larger in the Pareto inferior variant that maximizes U because the Pareto superior alternative is to change occupation or place of work in return for compensation, a standard way of getting to a Pareto Optimal outcome. Once it has downsized, moreover, the ability of an interest to support and influence the government is reduced, including its ability to ensure that past commitments are fully honored. More complex departures from efficiency can also occur.

To summarize: The economy reaches an equilibrium in which each economic interest maximizes its rent, and the government maximizes its political support. As part of this equilibrium, the government supplies favors to one or more interests in return for their support, which exchange raises G and one or more π^k . For reasons indicated above, this outcome may be Pareto inferior. The political influence of an economic interest depends on its size and on other factors affecting its bargaining strength, which reflects its ability to delay receipt of political favors vs. the government's ability to delay receipt of the interest's political support. We now apply these ideas to the theory of monopoly.

Political and Market Power

In order to derive monopoly price and output, suppose again that the terms of trade in exchanging political support for political favors are given—their determination will be investigated in the section to follow—and that the government has chosen a policy vector, e , to maximize G . When political leverage depends on size, an economic interest will lobby for political favors that are size-increasing. For example, an industry association may seek subsidies that reduce supply costs of member firms and allow non-competitive members to stay open. The size advantage suggests that the inefficiencies

associated with political capture result at least partly from keeping too many resources in politically powerful sectors, when these inputs would be more productive elsewhere. Such was the conclusion of Acemoglu and Robinson (1998), who cite historical examples (on pp. 17-21).

Offsetting this, however, is the need for a supplier to set price above average cost in order to translate its market power into profit. Thus in an economy with one monopoly and one competitive sector, the conventional view is that the former is too small and the latter too large. This is because the monopoly's price is above average and marginal cost, thereby restricting demand. The monopoly sector is "too small," in the sense that it would be larger in an efficient reference economy, with the same two sectors and underlying structure of demand, but in which both sectors operate under perfect competition. The conventional monopoly's rent-seeking is not constrained by its size, and it therefore has no incentive to seek political favors that are size-increasing.

By contrast, in the examples cited by Acemoglu and Robinson, beneficiaries of government redistribution received both protection and implicit or explicit size-increasing subsidies. When greater size means greater political influence—and also, potentially, greater political support for government—it is reasonable to expect that protection and subsidy will go together. In addition, subsidies are sometimes less transparent ways than price increases to raise monopoly profit. Let us call a monopoly whose size constrains its ability to extend political support and thus to seek rent a *size-driven* monopoly. Then a size-driven monopoly is assumed to receive both protection and subsidies, the latter being financed by taxes on the competitive sector. Here “taxes” are understood broadly to include all fees, penalties, fines, bribes, etc. that produce revenue for government.

Let P and Q be the product price and output of a size-driven monopoly. Q will be produced with labor, L , and capital, K , whose supply prices are $W = W(L)$ and $V = V(K)$. Let S be the political support available to this monopoly. Then Q , K , and L all index its size, allowing us to write the constraint on its political support as $S = s(Q, K, L, \pi)$, where π is the monopoly's after-tax profit. For each Q and S , the monopolist will choose profit-maximizing values of L and K , say $L(Q; S)$ and $K(Q; S)$. While S is constrained by the monopoly's size, its production requires scarce resources. For simplicity, I assume that S is produced with a fixed proportions technology—in which each unit of S requires l units of L and k units of K , for some $l, k > 0$ —and that the isoquants of Q (in $(L - lS)$ and $(K - kS)$) are convex to the origin (or have the usual shape). Solving $S = s(Q, K(Q; S), L(Q; S), \pi)$ for S gives $S = S(Q, \pi)$, where S is increasing in Q , owing to the size constraint. (However, at least part of the monopoly's size-related political influence may be tied directly to its hiring of inputs, on which more below.)

For any given terms of trade in political exchange, the monopoly will have a well-defined net tax obligation, $T = T(Q, K, L; S)$. The components of the policy vector, e , include the parameters of T plus the parameters of net taxes on the competitive sector. These parameters are determined, in turn, by the political terms of trade and by requiring political exchange to be efficient, which implies that G is maximized for any given π , and vice versa. The government rewards the monopoly's support, first by granting it protection and then with subsidies, which reduce T . The first S_0 units of S go to pay for protection, which allows the monopoly to keep its price above average cost. However, if the monopoly is size-driven, the equilibrium value of S will be greater than S_0 , with the additional support going to pay for decreases in T . In this case, the government also gains from increases in the monopoly's size, or it would not reward these increases.

The monopoly's total cost, including T , is $C(Q;S) = WL(Q;S) + VK(Q;S) + T$, and its demand price is $P = P(Q)$, decreasing in Q , which gives $\pi = P(Q)Q - C(Q;S)$. $P(Q)$ and $C(Q;S)$ are assumed to be second-order continuous, and all variables change continuously. The first-order condition for maximizing π with respect to Q is $\pi_Q + \pi_S S_Q = 0$ or:

$$P + QP_Q - C_S S_Q = C_Q, \quad (1)$$

where subscripts denote partial differentiation with respect to the indicated variables. Here S_Q is the increase in S made possible by a unit increase in Q (together with the associated increases in L and K), and C_S is the change in C resulting from a unit increase of S . If the monopoly supports more than one political entity—eg., the government and a political opposition—profit maximization also requires π_S to be the same for each of these entities.

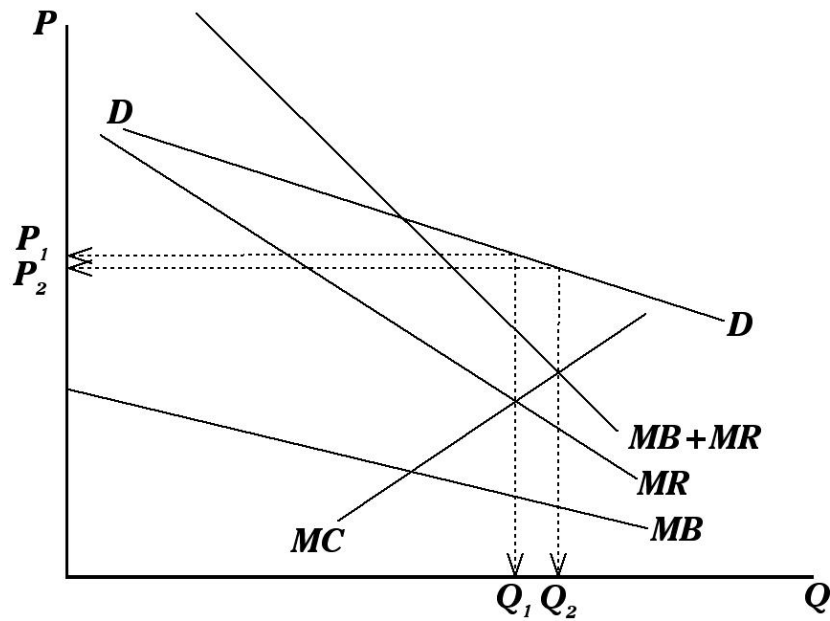
Let $MR = P + QP_Q$ be marginal revenue and $MC = C_Q$ be marginal cost, which is assumed to be non-negative. $MB = -C_S S_Q$ is the monopoly's marginal net political benefit. This is the marginal increase in the monopoly's profit that results because a unit increase in Q (and therefore in its size) allows it to increase its political support by S_Q units. Thus MB is the decrease in T minus any increase in the cost of S when S rises by S_Q units. Because political influence is size-driven, $MB > 0$, and (1) becomes:

$$MR + MB = MC. \quad (2)$$

Expansion of output yields a total marginal return of $MB + MR$, which equals MC at the profit maximum. This is shown in Figure 1, where D , MR , MC , and MB are the monopoly's demand, marginal revenue, marginal cost, and marginal net political benefit curves. The profit-maximizing price and output

are P_2 and Q_2 . When $MB > 0$, P is lower and Q higher than at P_1 and Q_1 , where $MR = MC$.

FIGURE 1



From equation (2), the monopoly sets Q where P is above, equal to, or below MC , as MB is less, equal to, or greater than $(P - MR)$ at the profit maximum. $P < MC$ is possible because the size constraint on political leverage leads the monopoly to sacrifice market power for greater size and political influence. Its combined market and political power is given by $[P - (MC - MB)]/P = \mathbf{L} + \mathbf{P}$, where $\mathbf{L} = (P - MC)/P$ is the Lerner index of market power and $\mathbf{P} = MB/P$ is its marginal political power. If $\varepsilon = P/(P - MR)$, (2) implies:

$$\mathbf{L} + \mathbf{P} = 1/\varepsilon, \quad (3)$$

whereas for a conventional monopoly, $L = 1/\varepsilon$. When the monopoly ignores cross-price effects in setting Q , ε is simply its own-price elasticity of demand.

Empirical evidence suggests that firms sometimes operate where their own-price elasticities are around one or even lower. (See, eg., Hagerty, Carman, and Russell (1988).) A positive MB could lead a firm which sets price and output to satisfy (2) and (3) to operate where $\varepsilon < 1$, although at least part of MB must then be tied directly to expansion of Q or reduction of P , regardless of changes in L and K . Otherwise, profit is never maximized where $MR < 0$, because it would be more profitable to waste one or more inputs.

The discussion above suggests that size-driven rent-seeking increases monopoly output by comparison with a conventional equilibrium, but this is not always true. For simplicity, let (2) be satisfied at just one output, Q_2 . Suppose the monopoly initially reaches a conventional profit maximum at which $S = S_0$ and $MC = MR$, and let monopoly output then be Q_0 . In general, $Q_0 \neq Q_1$, since the conventional monopoly's MC may differ from that of a size-driven monopoly. If we start at the conventional equilibrium and then allow the monopoly to seek further rent by raising S to the constraint level, it will increase both L and K , above L_0 and K_0 , since additional rent-seeking is profitable.

Thus the size-driven monopoly employs more resources than a conventional monopoly. However, at least some of these increases will be used in rent-seeking, or production of S , and it is straightforward to give an example in which $Q_2 < Q_0$. Consider the case in which: (i) the expansion of S , with $Q = Q_0$, leaves MR unchanged; (ii) MB depends entirely on the number of jobs provided by the monopoly (or L); (iii) the monopoly faces upward-sloping marginal factor costs of K and L . Suppose that $Q_2 \geq Q_0$. In this case, the size-driven monopoly produces

Q_0 with a greater labor intensity than the conventional monopoly, in the sense that $(L - lS)/(K - kS)$ is higher. Owing to additional rent-seeking, the marginal revenue product of K would otherwise be less than K 's marginal factor cost for the size-driven monopoly. This is inconsistent with $MR + MB \geq MC$ at $Q = Q_0$ if Q_0 is produced in the most profitable way.

But then the marginal revenue product of L plus L 's marginal political benefit may be less than the marginal factor cost of L at Q_0 , which is also inconsistent with $MR + MB \geq MC$.⁵ The marginal physical product of L is reduced by the greater labor intensity and by the diversion of additional L and K to rent-seeking as L increases. In addition, the marginal factor cost of L is higher at Q_0 for a size-driven than for a conventional monopoly. When $MR + MB < MC$ at Q_0 , the monopoly with size-driven rent seeking must reduce Q to get to its profit maximum, which is to say that $Q_2 < Q_0$. Thus while the size-driven monopoly produces where $MR < MC$ and uses more resources than a conventional monopoly, it may still supply less output.

Political Terms of Trade

To see how the terms of trade in political exchange are determined, let π_0 be the profit of a size-driven monopoly if no exchange of political support for political favors between the monopoly and the present government takes place. In this case, the monopoly will support a political opposition if this is consistent with profit maximization. Let G_0 be the government's support in the event of no exchange. If political exchange between these entities does in fact occur, there will be at least one possible outcome with $\pi > \pi_0$ and $G > G_0$. Such an outcome is assumed to exist here, although if it did not, we could do the same exercise with a political opposition in place of the government. Let $\Gamma(G - G_0)$ be the smallest sum of money which, if given now to the government, would enable it

to raise G_0 to G , for any $G > G_0$, or which it would accept in lieu of this increase. Then Γ is the value to government of $(G - G_0)$ and is assumed to be increasing with $(G - G_0)$. In maximizing G , the government also maximizes Γ .

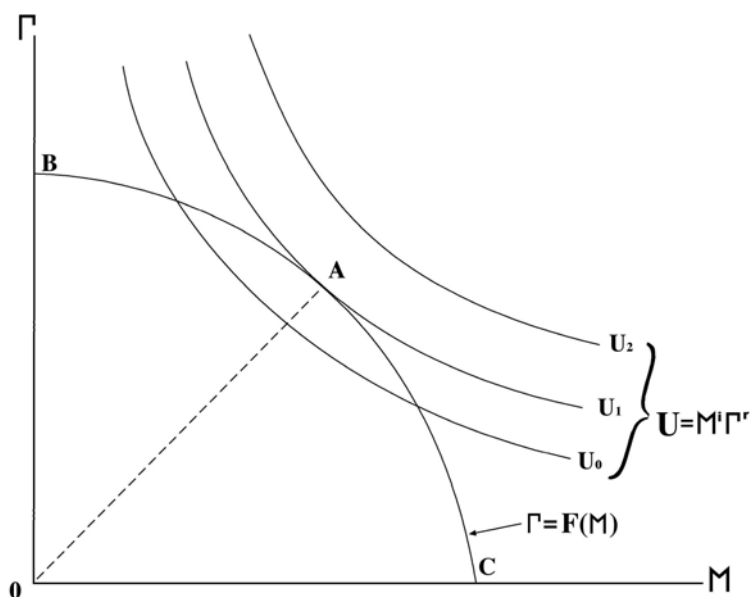
Let $M = (\pi - \pi_0)/\rho$ be the present value of $(\pi - \pi_0)$, where ρ is the monopoly's rate of time discount. In maximizing π , for any given ρ , the monopoly also maximizes M . Let r be the marginal cost to its present management of delaying receipt of a unit of M by one time period. In the simplest case, $r = (\rho - \ln \alpha)$, where α is the probability that present management will retain control for one more period of time if no exchange of political favors for support occurs.⁶ Since $\alpha \leq 1$, $r \geq \rho > 0$. Similarly, let $i > 0$ be the marginal cost to the present government of delaying receipt of a unit of Γ by one time period. In line with earlier discussion, the relative bargaining leverage of the monopoly vis-à-vis the government will depend on the relative values of i and r .

Pursuing this line of reasoning leads us to Bishop's "Zeuthen-Hicks" bargaining solution (1964), in which political exchange maximizes the generalized Nash product, $U = M^i \Gamma^r$, subject to a frontier, $\Gamma = F(M)$, of maximum attainable combinations of Γ and M . This also approximates Rubinstein's perfect equilibrium (1982) and is shown at A in Figure 2. The condition for being on $\Gamma = F(M)$ is that tax and other policy parameters be set to maximize Γ (or G), for any given M (or π), and vice versa.

Starting from any point on $F(M)$, let the government lower one or more tax rates on the monopoly. This will raise MB and/or lower MC , thereby increasing the profit-maximizing values of π , M , and S . By itself, the increase in S will raise G and Γ , but since we started from a maximal combination of Γ and M , the increase of M must coincide with a net fall in Γ , the reason being an increase in taxes on the competitive sector to

pay for the monopolist's tax break. Thus a fall in monopoly tax rates implies a movement down the political frontier. Let $-f$ be the slope of F , where $f (= -d\Gamma/dM)$ is the marginal political cost to government of increasing M by one unit. Then the larger is f —or the steeper is this slope—at any M/Γ , the more sensitive are Γ and G to the tax/deadweight costs of monopoly.

FIGURE 2



Because U is a Cobb-Douglas function whose indifference curves are asymptotic to both axes, $U = M^i \Gamma^r$ can only be maximized where both Γ and M are positive, as at A in Figure 2. The first-order condition for this is:

$$M = (1/f)(i/r)\Gamma \text{ or } \pi = \rho(1/f)(i/r)\Gamma. \quad (4)$$

The terms of trade, $(1/f)(i/r) = M/\Gamma$, index political capture. Although F is not necessarily convex from above, as depicted in Figure 2, it can be shown that whenever the political equilibrium is stable and unique, $fM/F = (-d\Gamma/\Gamma) \div (dM/M)$ is increasing around the maximum of U , as M and π increase. In this sense, there is rising marginal political cost of increases in monopoly profit. For any given political frontier, moreover, the higher is i/r , the greater will be the equilibrium values of M and π , and the smaller will be Γ and G .⁷

Let Γ_S be the value to government of a unit increase in S . A unit increase in Q raises Γ by $\Gamma_S S_Q$ —the marginal value to government of an increase in the monopoly's size—and π by MB . If the economy moves upward along OA in Figure 2, as the monopolist increases S , with M/Γ remaining constant, we have:

$$MB = \rho(1/f)(i/r)\Gamma_S S_Q. \quad (5)$$

MB is an increasing function of i/r and of the marginal value to government of an increase in the monopoly's size, and a decreasing function of the marginal cost (f) to government of raising M .

From (4) and the discussion above, political capture is a decreasing function of α , although the monopoly only has an incentive to exchange political favors for support when $\alpha > 0$. Thus the existence of political exchange implies that competition to control the monopoly is not perfect, since its present management expects that it might be able to survive for a time, even without the political favors brought by this exchange. The rationale would be that, by reason of past relationships and product, technology, industry, or firm-specific experience, present management has some advantage over rivals. If there is no competition to control the monopoly at all, $\alpha = 1$ and $r = \rho$, the minimum value of r . More generally, i/r will tend to be smaller, the more intense and immediate is the

competition to control the monopoly (or the smaller is α). Likewise, the more intense and immediate is the competition for political power, the larger i/r will tend to be. However, an increase in competition for political power does not necessarily increase political capture, since this may also affect f .

Suppose then that a political reform turns a stable dictatorship into a democracy by legitimizing competition between political parties, and that this increases competition for control of government.⁸ As a result, i/r will increase, which makes the indifference curves in Figure 2 steeper, but the marginal political cost of monopoly (f) may also rise, which shifts the political frontier, $F(M)$, inward and makes it steeper. How this will affect political capture depends on which increase is largest in percentage terms, in going from the old equilibrium to the new. Two possible outcomes are the following.

Outcome I: The dominant effect of reform is to make the political frontier steeper. In this case, $(1/f)i/r$ falls, which is to say that political capture decreases. Such a result is most likely when political reform is thoroughgoing, presenting voters with real and viable alternatives. As a result, G becomes more sensitive to the tax/deadweight costs of monopoly, because information about these costs becomes more readily available, and those who bear them can now translate this burden into downward pressure on G , simply by voting for rival parties. If the political cost of monopoly rises enough, G_0 will be the maximum value of G , which is therefore maximized by replacing the monopoly with competition, provided the post political reform government is able to do this. Even if the monopoly survives, the greater sensitivity of G to the costs of its political favors will put pressure on it to become more efficient.

Outcome II: The dominant effect of reform is to increase political competition. However, there is much anecdotal evidence to suggest that political reform may increase

political capture.⁹ Within the present context, the percentage increase in i/r would then exceed that of f because credible opposition parties or groups are unwilling or unable to credibly promise to break up the monopoly or increase competitive pressures on it. From (5), the increase in $(1/f)i/r$ also raises MB , and MB will rise further if the marginal value to government ($\Gamma_S S_Q$) of an increase in the monopoly's size goes up—since political reform makes it more important for government to have a large number of voters who benefit from political favors to the monopoly. The upward shift of MB will also raise the monopoly's equilibrium size.

Finally, from (4), the maximum value of M or π depends on the extent of political capture and on where the frontier, $\Gamma = F(M)$, lies. An increase in the amount of Q obtainable from given L and K may well shift this frontier outward and raise r by lowering α , thereby increasing political capture. Maximum π would then go up; profitability does depend directly and indirectly on efficiency in producing Q . But an increase in the amount of S obtainable from given Q , K , and L also shifts the frontier of maximal M and Γ outward. The management team able to earn the highest profit may gain its advantage from efficiency at rent-seeking—the ability to deliver more S from given Q , K , and L —rather than efficiency in producing Q . The management that is most efficient in production is not necessarily the most profitable or the one to survive.

The Effect of Size-Driven Rent-Seeking on the Monopoly's Cost

We next show that, in general, the monopoly whose political support is size-driven does not have an incentive to minimize the cost of its output, even allowing for the diversion of resources to rent-seeking (or even given the constraint, $S = s(Q, K, L, \pi)$). It may also waste inputs, in the sense of hiring units of L or K which it then keeps idle. Thus it may exhibit

internal inefficiency, or what is sometimes called X-inefficiency (Leibenstein 1966), which arises when a firm does not minimize its cost. Welfare losses from X-inefficiency are potentially high (eg., Leibenstein and Maital 1992).

To see why profit maximization and cost minimization may be at odds, note that a unit increase in L , with K and Q constant, has a marginal factor cost, denoted by w , and yields an offsetting gross marginal political benefit, $MB_L \geq 0$, since the rise in L , even with K and Q fixed, potentially enables the monopoly to increase S . Likewise, a unit increase in K , with L and Q constant, has a marginal factor cost of v , and yields an offsetting marginal political benefit of MB_K . In fact, $MB_L = -T_s s_L$ and $MB_K = -T_s s_K$, where the subscripts of T and s denote partial differentiation. Changes in T tied to increases in L and K are included in w and v (as was the case with MC).¹⁰ The cost to the firm of a unit increase in L , with K and Q constant, is therefore $(w - MB_L)$, and the cost of a unit increase in K , with L and Q constant, is $(v - MB_K)$.

The monopolist's production function can be written as $Q = \Theta((L - lS), (K - kS))$, where lS and kS are the amounts of L and K diverted to rent-seeking. We then substitute the constraint, $S = s(Q, K, L; \pi)$, into Θ to get Q as a function of K , L , and π . However, since K and L will be set to maximize π , we set $\pi = \pi^*$, the value of π at the maximum of $M\Gamma^r$, to get Q as a function of K and L only—say $Q = \mathbf{Q}(K, L)$. Convexity of Θ does not necessarily imply convexity of \mathbf{Q} . However, I shall assume that both K and L are required to produce any positive amount of Q and confine the investigation below to first-order conditions.

Let MP_L and MP_K be the marginal physical products of L and K , calculated from $\mathbf{Q}(K, L)$. Thus MP_L is the increase in Q resulting from a unit increase in L , with K constant, minus the cost in units of Q of additional resources devoted to rent-

seeking when L increases by one unit.¹¹ MP_K is defined in the same way. If the monopolist combines L and K in a way that maximizes the profit from any given Q , it will set L/K where:

$$MP_L(v - MB_K) = MP_K(w - MB_L). \quad (6)$$

If there is no cost *per se* of keeping inputs idle, $MP_L, MP_K \geq 0$, and (6) therefore gives best-profit production of a given Q only if the terms in brackets are both non-negative. When best-profit production occurs where $w = MB_L$ and $MP_L = 0$, with both MP_K and $(v - MB_K)$ positive, the monopolist chooses the smallest K that can produce this output, with L set where $w = MB_L$ and $MP_L = 0$. If best-profit production takes place where $v = MB_K$ and $MP_K = 0$, the smallest L is chosen that will produce this output, provided $(w - MB_L)$ is then positive. If $MB_L > w$, however, the firm is willing to increase L , even with no expansion of output, until $MB_L = w$, and similarly for capital whenever $MB_K > v$. The monopolist could therefore keep at least one input idle at the profit maximum.

By contrast, minimizing the private cost of any given Q requires:

$$w/v = MP_L/MP_K. \quad (7)$$

Thus only when $MB_L = (w/v)MB_K$ does the monopoly minimize cost in the private sense. If $MB_L > (w/v)MB_K$, it uses a higher L/K than (7) requires, whereas if $MB_L < (w/v)MB_K$, it uses a lower L/K , although it keeps no inputs idle as long as $w > MB_L$ and $v > MB_K$ at the profit maximum, since an increase in either input causes a net cost in the monopoly's cost. From a social point of view, however, (7) may also fail to give the lowest cost of producing Q when the monopolist faces upward-sloping input supply. Minimum social cost would be where $W/V = MP_L/MP_K$. Thus the monopoly here may produce a given output

at either a higher or a lower social cost than is implied by equation (7).

Let $MB_Q = -T_S s_Q$ be the gross marginal political benefit tied directly to an increase in Q or fall in P , independently of changes in L or K . This gives $MB = MB_Q + [(L'(Q)MB_L + K'(Q)MB_K)] - (wl + vk)S_Q$, where $L'(Q)$ and $K'(Q)$ are the total increases in $L(Q;S)$ and $K(Q;S)$ required by a unit increase in Q , including the increases used in rent-seeking. Maximizing π with respect to L and K requires:

$$MRP_L + MB_Q(MP_L) + MB_L = w. \quad (8)$$

$$MRP_K + MB_Q(MP_K) + MB_K = v, \quad (9)$$

where $MRP_L = MR(MP_L)$ and $MRP_K = MR(MP_K)$ are the marginal revenue products of L and K . Together, (8) and (9) imply (2), as can be seen by multiplying both sides of (8) by $L'(Q)$ and both sides of (9) by $K'(Q)$ and adding, while noting that $MC = w(L'(Q) - lS_Q) + v(K'(Q) - kS_Q)$ and $L'(Q)MP_L + K'(Q)MP_K = 1$ if no input is kept idle.¹²

The size-driven monopoly may use more or less of L or K than would equate the input's price with the value of its marginal product, and unlike a conventional monopoly, it may waste scarce inputs by keeping them idle. However, it never produces where $(MR + MB_Q) < 0$, since it could then raise its total revenue by decreasing Q without changing K or L . Thus it keeps units of both inputs idle only if $(MR + MB_Q) = 0$ at the profit maximum and then if and only if the profit-maximizing values of L and K are both greater than needed to produce the revenue-maximizing value of Q . If $(MR + MB_Q) > 0$, the monopoly wastes at most one input and then only if profit maximization requires a higher level of this input than maximizes Q , given the profit-maximizing level of the other input.

If the monopoly wasting scarce resources is the pessimistic scenario, a more optimistic scenario arises when G is more sensitive to deadweight losses, resulting in a steeper political frontier in Figure 2. In particular, suppose that G reflects efficiency weakly, for any given π , and given that $S = s(Q, K, L; \pi)$. That is, whenever a policy vector, e_1 , yields an allocation of resources that is Pareto superior to the allocation yielded by e_2 , and $\pi(e_1) \geq \pi(e_2)$, then $G(e_1) > G(e_2)$. (The same may not be true, however, if $\pi(e_1) < \pi(e_2)$.) Here $\pi(e)$ is maximum monopoly profit when the policy vector, e , prevails, and we recall that the components of e include the parameters of T and of net taxes on the competitive sector.

The monopoly has an incentive to publicize and promote Pareto-improving policy changes that raise π —provided this can be done without inadvertently promoting other changes that reduce π —and it has no incentive to oppose changes that leave π constant. Indeed, in the latter case, there may well be similar Pareto-improving policy changes that increase π (or allow the monopoly to share in the improvement). Monopoly support and publicity can partly compensate for the voter disincentive to acquire costly information and explains why one might assume that G reflects efficiency weakly for any given π .

$U = M^i \Gamma^r$ is then maximized by a policy vector that yields a Pareto Optimal allocation of resources, subject to $S = s(Q, K, L; \pi)$ and $\pi = \pi^*$, the U -maximizing value of π , since any Pareto superior allocation that is consistent with these constraints would also raise $M^i \Gamma^r$. The appendix indicates what conditions should be placed on the economy's tax parameters for this to occur. Each scarce input then has a positive marginal product—none is wasted—and the traditional deadweight loss triangle vanishes.

Yet, in general, the optimistic scenario is only a second best, owing to the use of resources in rent-seeking that could be producing useful goods and services. A first-best is possible only when the inputs used to produce S also shift the economy's production-possibilities frontier outward. For example, these resources might facilitate least-cost production of useful information for voters or for those who determine property rights and government policies, raising G by enabling production to become more efficient. U can not be maximized by unproductive rent-seeking in the optimistic scenario if productive rent-seeking is also available, that is consistent with $\pi = \pi^*$. However, exploration of this possibility lies beyond the scope of the present paper.

Conclusion

Rent-seeking occurs in any economy because governments create and preserve rents in order to increase their political support, which raises their ability to gain and stay in power, as well as to increase the wealth of politicians and public officials. Governments buy support with political favors, which leads to political capture or redistribution in favor of the economic interests whose support is purchased. In this context, the political influence of an economic interest—which depends on its ability to provide support—is assumed to increase as it grows larger, with the size advantage plausibly being greater in a democracy and in a country with relatively autonomous regional and/or local levels of government.

Monopoly can then be viewed as a political favor granted in exchange for political support. Because its ability to extend such support is constrained by its size, the monopoly analyzed in this paper sets output above the level where marginal cost equals marginal revenue and input use above levels where marginal factor cost equals marginal revenue product. The size constraint on political leverage leads it to sacrifice market

power for greater size and political influence. But while the size-driven monopoly uses more resources than a conventional monopoly, it may also supply less output.

Potentially, the size-driven monopoly creates three types of deadweight loss, whose combined burden may be high or low, depending on the extent of political capture and on the nature of G , or what the government has to do to maximize G . First is the opportunity cost of producing S , or of raising G_0 to G , plus the cost of any competition for control over the monopoly. Unless S is in some way helpful in the production of Q , rent-seeking directly reduces the output obtained from given K and L , and the same is true of competition for control over the monopoly. Second, the monopolist does not, in general, set an efficient rate of output—even allowing for the diversion of resources to rent-seeking—which causes inputs to be misallocated between sectors, and gives rise to the conventional “deadweight loss” triangle.

Third, when political influence depends on employment of inputs, the size-driven monopoly may be X-inefficient. That is, it may not minimize cost, and may even hire inputs and keep them idle. In addition, the management team able to earn the highest profit is not necessarily the one able to obtain the most efficient production, since profit also depends on efficiency in rent-seeking. Potentially, this is the largest part of the welfare loss from monopoly, since a completely different type of management is likely to emerge in an environment where ability to seek rent is more valuable than ability to succeed in the market.

The monopoly's political influence depends on its size, but also on the terms of trade in exchanging political favors for political support. These terms reflect the extent of competition to control the government and competition to control the monopoly, as well as the marginal political cost to government of increasing the monopoly's profit by giving it political favors.

In these conditions, political reform in the sense of democratization will lead to a monopoly that is more efficient—and perhaps even to its elimination—when the dominant effect of reform is to raise the political cost of monopoly. Otherwise, the increase in competition for control of government may strengthen the monopoly’s bargaining position and make government more reliant on its support.

More generally, if G is insensitive to the cost of monopoly, but strongly and positively responsive to its hiring of labor or capital, the likely outcome is a pessimistic scenario, in which the monopoly wastes resources, and politicians or government officials use it to provide jobs, rents, and other benefits to supporters and their relatives and friends. But if government must periodically face a sophisticated electorate, in an environment where clear-cut political alternatives exist and well-developed democratic institutions make transfers more transparent and inefficiencies harder to conceal, G will be more sensitive to tax and deadweight costs. Then the optimistic scenario, with its trimmer, more efficient monopoly, becomes more likely, or even replacement of the monopoly by competition.

APPENDIX

Suppose that G reflects efficiency weakly, for any given π , and that total supplies of labor and capital to the two-sector economy described in the text are fixed. Let T_C be the marginal tax on both labor and capital in the competitive sector and the only marginal tax on that sector. Let $T = T(Q,K,L;S)$ again be the net tax on the monopoly, with infra-marginal component, T_θ , and marginal tax rates, T_Q , T_K , T_L , and T_S , with respect to Q , K , L , and S . Given the production function, $Q = Q(K,L)$, we impose five conditions on T_θ and the four marginal tax rates: (i). $\pi = \pi^*$, the value of π that maximizes $M^i\Gamma^r$. (ii). $S = S^*$, the value of S at the maximum of $M^i\Gamma^r$. (iii). The government

budget must balance. (iv) and (v). $w = W(1 + T_C) + MB_L + [MB_Q + MR - P]MP_L$ and $v = V(1 + T_C) + MB_K + [MB_Q + MR - P]MP_K$, recalling that w and v are computed inclusive of net taxes on the monopoly which are not tied to changes in S .¹³

When (iv) and (v) hold, (8) and (9) become:

$$VMP_L = W(1 + T_C) \quad (10)$$

$$VMP_K = V(1 + T_C), \quad (11)$$

where $VMP_L = P(MP_L)$ and $VMP_K = P(MP_K)$ are the marginal value products of L and K . We then have as well:

$$MP_L/MP_K = W/V \quad (12)$$

$$P = MSC(1 + T_C) = W(1 + T_C)/MP_L = V(1 + T_C)/MP_K, \quad (13)$$

where MSC is the social marginal cost of Q .¹⁴

Equations (10), (11), and (13) are necessary conditions for Pareto Optimality, given fixed input supplies, which is to say that they are necessary to maximize a utility function increasing in Q and in the output of the competitive sector, subject to $Q = Q(K,L)$ and to the competitive sector's production function. The ratio of output prices in the two sectors then equals the ratio of marginal social costs. Equation (12) is necessary to minimize the social cost of Q , given that $Q = Q(K,L)$. The total tax collection from the competitive sector—also the subsidy available to the monopoly—is then determined by the value of T_C . Together with the parameters of T , this determines the maximum value of π . In fact, tax parameters should be set to maximize $M^i T^r$, but when G reflects efficiency weakly, for any given π , the first-order conditions for this maximization must imply equations (10)-(13).

Notes

1. Two basic rent-seeking references are Posner (1975) and Krueger (1974). Their well-known result is that the cost of rent-seeking equals the expected rent, but their approach differs from the one below in two respects. First, their rent-seeking is not size-driven. Second, they emphasize the role of competition to obtain rent (or competition to control the monopoly within the context of the present paper), but essentially ignore competition to control the government. In the present paper, both types of competition play a role, and neither can be perfect. Thus the treatment of monopoly and government here is more symmetric than in Posner.
2. For example, competition to exploit a scarce common-property resource may destroy the value of this property—and perhaps the resource itself—through over-use (Gordon 1954). If no one can establish an exclusive claim to the rent from a resource, this rent will vanish, and the resource will have no value. But the parties involved in exploiting it will try to prevent this by establishing exclusive claims. When they succeed, resources that are initially common property will come into private and/or public ownership, with provision for restricting access to them in order to preserve at least part of their value. The creation of these property rights via rent-seeking will be wealth increasing, provided the cost of creating them is less than the rent that they preserve. The right to claim this rent is what motivates rent-seeking, regardless of whether this is productive or destructive.
3. For additional evidence that size plays an important role, see, eg., Anderson and Baldwin (1981), Cassing and Hillman (1986), and Babcock, Engberg, and Glazer (1997).
4. The basic idea of a government support function comes from Grossman and Helpman (1994), although the one used here is different from theirs.
5. Using notation introduced below plus the convexity of the production function, Θ , introduced below, it is straightforward to show that equation (6) plus either $MRP_L + MB_L < v$ or $MRP_K < v$ at $Q = Q_0$ implies $MR + MB < MC$ for the size-driven monopoly.
6. If the exchange of political favors for support begins t time periods from now, the present value of the monopoly to its current management is $\alpha Me^{-rt} = Me^{-rt}$, where r is defined by this equality. In effect, its management receives a share of M , contingent on being in control when the exchange begins.
7. If we recast our optimizing problem as one of maximizing $\ln U$, subject to $\ln \Gamma = \ln F(e^{\ln M})$, where \ln denotes natural log, the indifference curves of $\ln U$ are linear in $\ln \Gamma$ and $\ln M$, with slope $-(i/r)$, and the slope of the political frontier in the $(\ln M, \ln \Gamma)$ plane is $-fM/F$. At the maximum of $\ln U$, (4) again holds, and if this maximum is unique and stable, fM/F must be increasing as M and π increase, because the indifference curves of $\ln U$ are straight lines. Moreover, suppose two utility functions, U_1 and U_2 , such that U_2 is characterized by a higher i/r . Then the maximum of $\ln U_1$ must lie above that of $\ln U_2$ on the frontier $\ln \Gamma = \ln F(e^{\ln M})$, where Γ is higher and M lower, because the value of $\ln U_2$ at the maximum of $\ln U_1$ is greater than at any higher point on the frontier.
8. For example, several former Communist Party dictatorships in Central and Eastern Europe legitimized political party competition in the late 1980s and early 1990s. Each of these economies then had a large sector of state-owned firms, which had historically been protected from competition—and which we can think of as the “monopoly” sector—plus a sector of mainly small nonstate firms, which we may think of as the “competitive” sector. These

countries also tried to transform themselves from Soviet-type to market economies, with widely varying degrees of success in establishing competitive and growing economies.

9. See, for example, Hellman and Kaufmann (2001), Blanchard and Shleifer, and Lambert-Mogiliansky, Sonin, and Zhuravskaya (1999).

10. Let ε_L and ε_K be the supply elasticities of L and K . Then $w = W(1 + 1/\varepsilon_L) + T_L + T_Q MP_L$ and $v = V(1 + 1/\varepsilon_K) + T_K + T_Q MP_K$, where subscripts of T denote partial differentiation with respect to the indicated variables.

11. Comparing $Q = Q(K, L)$ with $Q = Q(L - lS, (K - kS))$, where $S = S(Q, K, L; \pi^*)$, gives the following relation between MP_L and the more conventional marginal product of L , MP'_L , or the increase in Q caused by a unit increase of L , with K and S constant. $MP_L = MP'_L - [(MP'_L l + MP'_{Kk})(s_L + s_Q MP_L)]$, where the subscripts denote partial differentiation. Likewise $MP_K = MP'_K - [(MP'_L l + MP'_{Kk})(s_K + s_Q MP_K)]$. Also differentiating $Q = Q(K(Q; S(Q; \pi^*)), L(Q; S(Q; \pi^*)))$ with respect to itself gives $L'(Q)MP_L + K'(Q)MP_K = 1$.

12. See note 11.

13. See note 10.

14. Marginal social cost is given by $MSC = WL'(Q) + VK'(Q)$, where W , V , $L'(Q)$, and $K'(Q)$ are as defined in the text. Equation (13) then comes from (12) and the relation, $L'(Q)MP_L + K'(Q)MP_K = 1$ in note 11.

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