CHAPTER 15

Rent seeking

> The *positive* evils and dangers of the representative, as of every other form of government, may be reduced to two heads: first, general ignorance and incapacity, or, to speak more moderately, insufficient mental qualifications, in the controlling body; secondly, the danger of its being under the influence of interests not identical with the general welfare of the community. (Italics in original)
>
> John Stuart Mill

In Chapter 12 we discussed a model of political competition in which politicians provide policies or legislation to win votes, and citizens and interest groups provide votes. From the discussion up to this point, it seems reasonable to think that the legislation consists of either public goods with characteristics that appeal to given groups of voters or income transfers from one sector of the population to another. The latter might be a tax loophole benefiting a particular group coupled with a rise in the average tax rate to make up for the revenue lost through the loophole. Income can be transferred from one group to another by other, more subtle means, however.

The government can, for example, help create, increase, or protect a group's monopoly position. In so doing, the government increases the monopoly rents of the favored groups at the expense of the buyers of the groups' products or services. The monopoly rents that the government can help provide are a prize worth pursuing, and the pursuit of these rents has been given the name of rent seeking.

15.1 The theory of rent seeking

Rent seeking was first discussed systematically by Tullock (1967c). The term "rent seeking" was first used to describe the activity in question by Krueger (1974). Figure 15.1 depicts the demand schedule for a monopolized product. If the monopoly charges the monopoly price P_m instead of the competitive price P_c, the rectangle R of monopoly rent is created, as is the welfare triangle L of lost consumers' surplus on the output of the monopolized product, that would have been produced under perfect competition but is not provided by the monopolist.

In the traditional discussion of monopoly, it has been customary to treat L as a measure of the efficiency loss due to monopoly, and R as a pure redistribution of income from the consumers of the monopolized product or service to its producers. Suppose, however, that the monopoly has been created and is protected by an action of the government. For example, an airline might have been granted a monopoly

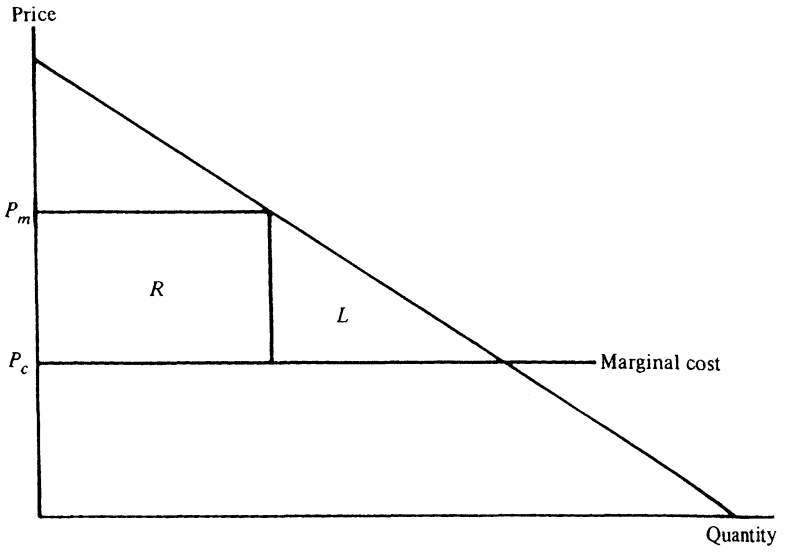

Figure 15.1. The social costs of monopoly with rent seeking.

over the routes between two or more cities. If there were more than one airline in the country that could service the routes, then R, or the present discounted value of R, would be a prize to be awarded to the airline that succeeds in inducing the government to grant it the monopoly over the routes. If the airlines could invest resources and increase the probability of obtaining the monopoly, they would do so. Tullock's (1967c) initial insight revealed that these invested resources may constitute a social cost of monopoly in addition to the welfare triangle L.

Buchanan (1980a, pp. 12–14) has identified three types of rent-seeking expenditures that may be socially wasteful:

1. The efforts and expenditures of the potential recipients of the monopoly
2. The efforts of the government officials to obtain or to react to the expenditures of the potential recipients
3. Third-party distortions induced by the monopoly itself or the government as a consequence of the rent-seeking activity

As examples of each of these, assume that the airlines employ lobbyists to bribe the government official who awards the routes. It becomes known that the income of this government official is supplemented by bribes, and thus lower-level government officials invest time studying the airlines industry to improve their chances of obtaining this position. Finally, assume that the government's additional tax revenue from creating the monopoly leads to a competition among other interest groups for subsidies or tax breaks. The lobbying effort of the airlines industry is an example of the first type of social waste. The extra efforts of the bureaucrats to be promoted is an example of the second category (assuming that they do not improve the route allocation process, which is a reasonable assumption if the awards are determined

by the bribes). The expenditures induced by the other interest groups to capture the extra tax revenue generated are an example of the third category of social waste.

Note that the bribe itself is not regarded as a social waste. If an airline could win a monopoly position simply by offering a bribe, and this bribe could be costlessly transmitted to the government official awarding the routes, and this was all that the bribe brought about, then no social waste would be created by the bribe. It would simply be a further redistributional transfer from the passengers of the airline, through the airline to the government official. The social waste in passing the bribe comes in the transaction costs of making the bribe, the fee of the lobbyist, and the wasted time and money of the bureaucrats competing for the promotion that places them in the position to receive the bribes.[1]

Considerable attention has been devoted in the literature to the issue of whether the rents of monopoly are totally dissipated by socially wasteful expenditures to capture them. We shall explore this question with a series of models beginning with the basic rent-seeking model with a fixed number of players. We shall then consider the consequences of free entry, sequential plays of the game, and a number of extensions of the model that have been proposed.

15.1.1 *The basic rent-seeking model with a fixed number of players*

In the basic rent-seeking game n players each invest I to capture a rent of R. The probability that any individual rent seeker captures the rent is assumed to be proportional to her investment,

$$\pi_i(I_i) = \frac{f_i(I_i)}{\sum_{j=1}^{n} f_j(I_j)}, \tag{15.1}$$

where $\partial \pi_i / \partial I_i > 0$. Investments in rent seeking exhibit diminishing, constant, or increasing returns as $\partial^2 \pi_i / \partial I_i^2 < 0, = 0$, or > 0. Tullock (1980) introduced this model under the assumption that $f_i(I_i) = I_i^r$, and much of the literature has explored this variant of the model. In this formulation, rent seeking has diminishing, constant, or increasing returns as $r < 1, = 1$, or >1.

Under the assumption that all rent seekers are risk neutral, each chooses the I that maximizes her expected gain $E(G)$,

$$E(G) = \left(\frac{I^r}{I^r + T} \right) R - I, \tag{15.2}$$

where T is the impact of the total outlays of the other $n - 1$ rent seekers, $T = \sum_{j \neq i} I_j^r$. Under the Cournot-Nash assumption that the other rent seekers' outlays remain fixed, the first-order condition from (15.2) is

$$\frac{r I^{r-1} R}{I^r + T} - \frac{r I^{r-1} I^r R}{(I^r + T)^2} - 1 = 0. \tag{15.3}$$

[1] That some expenditures to obtain rents may be transfers of one sort or another and not a pure social waste has been discussed by Brooks and Heijdra (1986). Congleton (1988) points out that the payment to the lobbyist is not simply a transfer, assuming that she could be employed doing something socially productive.

Assuming a symmetric equilibrium, we obtain from (15.3)

$$I = \frac{(n-1)}{n^2} rR. \tag{15.4}$$

A risk-neutral rent seeker invests the I given in (15.4), as long as this I when substituted into (15.2) yields a nonnegative expected gain. When the implied expected gain is negative, the potential rent seeker does not participate. Three sets of outcomes, depending on the value of r, are of special interest.

15.1.1.1 *Diminishing or constant returns,* $r \leq 1$. Substituting (15.4) into (15.2) and rearranging, we obtain the following condition to ensure a nonnegative expected gain from participation:

$$\frac{n}{n-1} \geq r. \tag{15.5}$$

Since the minimum n of interest is two, $1 < n/(n-1) \leq 2$, and (15.5) is satisfied for *all* $r \leq 1$. With diminishing or constant returns to rent seeking, an equilibrium always exists with positive rent-seeking investments.

The total amount invested at this equilibrium is n times the I implied by (15.4),

$$nI = \frac{n(n-1)}{n^2} rR = \frac{(n-1)}{n} rR. \tag{15.6}$$

Dividing this number by R, we obtain the total amount invested in rent seeking as a fraction of the rents sought,

$$\frac{nI}{R} = \frac{(n-1)}{n} r. \tag{15.7}$$

With constant returns to scale an analogous result to that of the Cournot oligopoly model is obtained. The fraction of the total rent which is dissipated ranges from 1/2 for two rent seekers up to full dissipation as n approaches infinity.

With diminishing returns to rent seeking ($r < 1$), the fraction of the rent dissipated is *always* < 1. For example, with $r = 1/2$, the fraction of R dissipated must be between 1/4 and 1/2.

15.1.1.2 *Increasing returns with* $1 < r \leq 2$. If $n \geq 2$, the upper bound of $n/(n-1)$ is 2, and (15.5) implies an upper bound for r of 2. With $r = 2$ and $n = 2$, each rent seeker invests $R/2$ and the total sum invested equals the total rent sought.

With smaller rs equilibria can exist with ns greater than 2. For example if $r = 1.5$, an equilibrium exists with $n = 3$ at which full dissipation occurs. If $n = 2$, only 2/3 of R is dissipated. The reason for the inverse relationship between r and the number of rent seekers who can exist in the rent-seeking game with $I > 0$ is easy to see from (15.4). Let I^* be the I that satisfies this optimality condition. Then $\partial I^*/\partial r = (n-1)R/n^2 > 0$. An increase in r holding n constant increases the optimal investment for each rent seeker, and thereby the likelihood that the sum of the

investments exceeds R, at which point participation in the game becomes irrational. On the other hand, an increase in n reduces a rent seeker's optimal investment, $\partial I^*/\partial n < 0$, thus increasing the likelihood of an equilibrium with positive Is.

With $1 < r \leq 2$, full dissipation of R occurs for values of n and r, which satisfy (15.5) as an equality; for example, $n = 2$ and $r = 2$, $n = 3$ and $r = 1.5$, $n = 4$ and $r = 4/3$, and so on. For all other equilibria with $I > 0$, $nI < R$.

15.1.1.3 *Increasing returns with $r > 2$.* With $r > 2$, increasing returns are sufficiently strong that no pure strategy equilibria exist. The extreme form of increasing returns would resemble an auction with R going to the rent seeker making the highest I. Each rent seeker has an incentive to try to outbid the other rent seekers so long as $I < R$, and an escalation of bids can be anticipated that leads all I toward R. In a normal auction, as say for a painting, the highest bidder gets the painting and pays out the amount bid, while all other bidders return home absent the painting but still in possession of the money that they bid. The nature of rent seeking is such, however, that all rent seekers forfeit their investments. No politician gives back the campaign contributions and bribes he received from those who are not rewarded with tariffs, price supports, etc. In a rent-seeking, bidding contest nI would appear likely to approach nR (Tullock, 1980).

Before I reaches R, however, the expected gain to a rent seeker becomes negative, and a risk-neutral rent seeker drops out. After all rent seekers have dropped out, the competition can begin again. No Nash equilibrium in pure strategies exists for this game, but mixed-strategy equilibria do exist at which all rents are fully dissipated ex ante.[2]

A mixed strategy is one in which each rent seeker effectively pulls an I out of a hat containing an infinite number of different Is lying between zero and R. Since no rational, risk-neutral person will enter such a game if her expected gain is negative, it is not surprising to find that the expected payoffs from this game are zero. In an actual play of such a game, the Is each player draws will in general not sum to precisely equal R. Thus, overdissipation of R can be expected *on some occasions*, when there are significant increasing returns to rent seeking. Baye, Kovenock, and de Vries (1999) demonstrate that the probability of observing overdissipation declines with N, but only as far as 0.44, when $N = \infty$.

15.1.2 *The impact of free entry*

Whenever the expected gain to a rent seeker remains positive after the entry of additional rent seekers, n can be expected to increase if entry is unrestricted. We saw in Subsection 15.1.1 that an equilibrium always exists with $I > 0$, when $0 < r \leq 1$. Thus, entry can always be expected in this case with n approaching infinity. From (15.7) we obtain

$$\lim_{n\to\infty} \frac{nI}{R} = r. \tag{15.8}$$

[2] See Hillman and Samet (1987) and Baye, Kovenock, and de Vries (1994).

Thus, in the case of free entry and constant returns to scale ($r = 1$), we expect full dissipation of the rent. Following Posner (1975), most empirical studies that have tried to measure the losses from rent seeking have assumed constant returns and free entry, and thus have approximated the rent-seeking losses by the area of the monopoly rent rectangle.

With ($1 < r \leq 2$), some finite $n^* \geq 2$ exists, such that the expected gain from an I^* satisfying (15.4) is nonnegative, while for $n^* + 1$ the expected gain is negative. Free entry will thus produce an equilibrium at which $n = n^*$. R will be fully dissipated if this n^* is such that (15.5) is satisfied as an equality; less than fully dissipated if it is satisfied as an inequality. The smaller r is, the larger n^* is, and the greater is the expected fraction of R that is dissipated.

As noted in Subsection 15.1.1.3, with $r > 2$ the only equilibria to the game are mixed-strategy equilibria with the rents fully dissipated ex ante by the sum of rent-seeking investments. This result is independent of n.

15.1.3 *Rent seeking with sequential investments*

Up until this point we have assumed that all players choose the levels of their investments simultaneously. As already mentioned, this way of modeling rent seeking is analogous to the Cournot oligopoly model, *except* that the normative implications are reversed. Where increasing the number of sellers in an oligopoly increases output and thereby social welfare because price falls, increasing the number of players in a rent-seeking game *reduces* social welfare by increasing the total funds invested in rent seeking.

Sequential output choices in an oligopoly were first studied by the German mathematician von Stackelberg. In the von Stackelberg oligopoly model, the first player to select an output can take advantage of the negative-sloped reaction curves that characterize a quantity-setting game by selecting an output that is greater than the equilibrium output in the simultaneous-play, Cournot game. If two sellers have different costs of production, society is better off in a Stackelberg duopoly game if the lower cost seller goes first. Once again in a sequential-play, rent-seeking game the situation is exactly reversed. Less funds are invested and society is consequently better off if the more effective rent seeker goes second.

To see this, consider a simple two-player rent-seeking game in which the first player leads by choosing an investment I_L, and the second player follows with an investment I_F. The mathematics is somewhat simpler if we capture the relative effectiveness of each player's investments through a multiplicative factor α rather than through an exponential relationship. Thus, we write the probability that L wins the rent-seeking contest as

$$\pi_L(I_L) = \frac{I_L}{I_L + \alpha I_F}, \tag{15.9}$$

where $\alpha < 1$ implies that the first player's investments are more effective than those of the second, and $\alpha > 1$ implies the reverse. L's expected gain from playing the

game can then be written as

$$E(G_L) = \left(\frac{I_L}{I_L + \alpha I_F}\right) R - I_L. \tag{15.10}$$

Maximizing (15.10) with respect to I_L produces

$$I_L = \sqrt{\alpha R I_F} - \alpha I_F. \tag{15.11}$$

The analogous exercise with respect to F's choice of I_F yields

$$I_F = \sqrt{\frac{R I_L}{\alpha}} - \frac{I_L}{\alpha}. \tag{15.12}$$

Equations (15.11) and (15.12) define the optimal choices of I_L and I_F, given the other player's investment. These two equations thus define the reaction functions for each player. L can exploit his first-mover advantage by substituting F's reaction function, (15.12), into L's gain function, (15.10), and choosing the I_L that maximizes this expression. Making this substitution we obtain

$$E(G_L) = \frac{I_L}{I_L + \alpha\left[\sqrt{\frac{I_L R}{\alpha}} - \frac{I_L}{\alpha}\right]} R - I_L. \tag{15.13}$$

which simplifies to

$$E(G_L) = \frac{I_L}{\sqrt{\alpha R I_L}} R - I_L. \tag{15.14}$$

Maximizing (15.14) with respect to I_L yields

$$I_L = \frac{R}{4\alpha}. \tag{15.15}$$

Substituting this value of I_L into (15.12) gives us follower F's optimal response to L:

$$I_F = \frac{R}{2\alpha}\left(1 - \frac{1}{2\alpha}\right). \tag{15.16}$$

It is easy to see from (15.15) and (15.16) that when the investments of both players are equally effective (that is, $\alpha = 1$), both invest the same amount, $R/4$, and the outcome is the same as under the simultaneous-play, Cournot game.

When $\alpha \neq 1$, the player whose investment is more effective earns a higher expected return by going *second*, while the weaker player earns a higher return by going first. This can be seen by using (15.15), (15.16), and (15.10) to obtain the expected gain from being the leader or follower:

$$E(G_L) = \frac{R}{4\alpha} \tag{15.17}$$

$$E(G_F) = R\left(1 - \frac{1}{2\alpha}\right)^2. \tag{15.18}$$

With $\alpha = 3/4$, the first player to choose an investment is the stronger player and his expected gain from (15.17) is $R/3$. Assuming the same relative strengths, but that the stronger play goes second, would imply $\alpha = 4/3$ and an expected gain for the now stronger, second player as given by (15.18) of $25R/64$, which is greater than $R/3$. If the players can choose both *when* to invest as well as how much, the stronger player will opt to go second, the weaker to go first, and society will be better off than under any alternative sequence, since the total amount invested will be minimized.

In this example we have assumed that the two players differ according to the relative effectiveness of their investments, as captured by α. An additional complication would be to assume that the two players value the rents differently. With $\alpha = 1$, the player who places the highest value on the rent will prefer to go second, and will make the highest investment. More generally, if α_1 measures the effectiveness of player 1's investments, α_2 the effectiveness of player 2's investments, and R_1 and R_2 are the values of the rents to the two players, then player 1 will invest more and opt to go second, if and only if $\alpha_1 R_1 > \alpha_2 R_2$.[3]

15.1.4 *Relaxing the assumptions*

The assumptions underlying the basic rent-seeking model have been relaxed in many ways. We shall not discuss every variant on this model that has been introduced. A few of the more important extensions warrant some attention, however.

15.1.4.1 *Risk-neutrality.* Consider first the effect of dropping the risk-neutrality assumption. Hillman and Katz (1984) illustrate the effects of risk aversion by rent seekers for the special case in which risk aversion is introduced by assuming that each individual has a logarithmic utility function. Table 15.1 is taken from their paper. The R/As are the rents to be gained relative to a rent seeker's initial wealth. The ns are the numbers of rent seekers. Note that when the rents to be won are small relative to the rent seeker's initial wealth (e.g., less than 20 percent), over 90 percent of the value of the rents is dissipated by the competition to obtain them. This result also holds when risk aversion is introduced by assuming other forms of utility functions (Hillman and Katz, 1984, pp. 105–7).

Much of the rent-seeking literature discusses the process as if rent seekers were individuals acting on their own behalf. In these cases, it is sometimes reasonable to assume that the value of the sort of rents sought is large relative to the initial assets of the rent seekers. But in most instances of rent seeking through the public sector, and probably in private sector rent seeking also, the size of the rents sought will be small relative to the assets of the rent seekers. If we assume that the stockholders of a corporation are the ultimate recipients of its profits, then the rents that the airline would earn by having a monopoly over an air route between two cities must be compared to the aggregate wealth of the stockholders of the airline. The rents that milk farmers earn from an increase in the price supports for milk must be divided

[3] Our exposition here has followed Leininger (1993). See also the more general results of Baik and Shogren (1992) who build on Dixit (1987), Hillman and Riley (1989), and Nitzan (1994a).

Table 15.1. *Competitive rent dissipation, logarithmic utility, A = 100*

	n						
R/A	2	3	5	10	50	100	1 000
0.10	98	97	96	96	95	95	95
0.20	95	94	93	92	91	91	91
0.50	88	85	83	82	81	81	81
1.00	76	74	72	70	70	69	69
5.00	32	34	35	36	36	36	36
10.00	18	21	22	23	24	24	24

Source: Hillman and Katz (1984).

by the assets of all milk farmers. In public sector rent seeking, the ratio of potential rents to initial assets of the relevant rent-seeking groups should be small, and the relevant rows of Table 15.1 are one and maybe two. Competitive rent seeking can be expected to result in nearly a full dissipation of the rents even when the rent seekers are risk-averse.[4]

The issue of the size of the rent seekers' assets becomes more complicated when we recognize the principal-agent problem in the joint stock company or the other forms of interest groups. The decision to invest airline revenues to win a monopoly on an air route is made by the airline's managers. To whose wealth should the investment be compared?

When the manager-agents of shareholders are the relevant actors in the rent-seeking game, the assumption that these actors are risk-averse is no longer very plausible. The bulk of the money that the airline's management is investing belongs to the company's shareholders, and this fact will induce managers to take greater risks (Jensen and Meckling, 1976). When rent seekers are agents investing the money of their principals, risk-taking behavior is more plausible than risk aversion, and an overdissipation of rents can be expected. Similar considerations probably apply to the rent-seeking actions of the agents of other interest groups (labor unions, farm associations).

Knight (1934) argued that the self-selection process for choosing entrepreneurs made entrepreneurs as a group risk takers. He thus predicted that aggregate profits would on average be negative owing to the overcompetition for profits by risk-taking entrepreneurs. Since profits and rents are one and the same to the individual entrepreneur, Knight's assumption would lead one to expect that entrepreneurial rent seeking under competitive conditions more than fully dissipates all potential rents. Moreover, this conclusion should hold whether the rents sought come from private market investments (e.g., advertising and patenting), or from political markets (campaign expenditures, lobbying). The principal-agent problem should, if anything, exaggerate this tendency.

[4] More generally, Konrad and Schlesinger (1997) show that an increase in the degree of risk aversion on the part of rent seekers has an *ambiguous* impact on the size of their investments.

15.1.4.2 *Rent seeking among groups.* When groups engage in rent seeking, there are two opposing effects on the levels of investment undertaken. First, by joining a group an individual effectively forms a cartel with all other members of the group. This increases the effectiveness of the group's rent-seeking efforts and increases the group's expected gain (Baik and Shogren, 1995). On the other hand, if the contributions of each group member are not specified with penalties imposed for underpayment, the usual free-rider problem arises and individuals tend to contribute less than the collectively optimal amounts – which of course from the point of view of society is good (Nitzan, 1991)!

Under the constant returns-to-scale assumption ($r = 1$ in (15.2)), the optimal payoff to each group member will be proportional to her contribution to the group's efforts, and the sum of all group investments will again tend to fully dissipate the rents sought (Lee, 1995).

15.1.4.3 *Rent seeking when the probability of winning is not defined logistically.* Using (15.1) to define the probabilities of each rent seeker's victory has the disadvantage of leaving these probabilities undefined when all investments are zero. A reasonable assumption to make in this case would be that each player has the same probability of winning, but then (15.1) would imply a discontinuous leap to one in the probability of victory for any player if she spends even a tiny sum to win the rent. Zero rent-seeking outlays is thus a very unstable equilibrium when the probabilities of success are defined logistically as in (15.1). This disadvantage can be avoided by assuming that the probabilities of winning the rent depend on the *differences* in the amounts spent on rent seeking rather than their ratios (Hirshleifer, 1989). This variant of the rent-seeking model also has some problematic implications, however. For example, with two rent seekers, A and B, the probability that A wins the rent takes the form $\pi_A = f(I_A - I_B)$. This probability will be the same whether A invests \$100 and B \$1, or A invests \$1,000,100 and B \$1,000,001.[5]

15.1.4.4 *Designing rent-seeking contests.* Much of the literature assumes that the value of the prize in a rent-seeking contest is the same for all players. The value of a license to import automobiles might well differ across potential importers, however. One airline may be able to make higher profits on a given route than another. When this is the case, the government may be able to increase the magnitude of the total rent-seeking outlays by appropriately structuring the rent-seeking contest.

Consider first a rent-seeking contest with two players who place the values R_1 and R_2 on the prize to be won – say, an import license. The prize will be awarded to the importer making the largest rent-seeking investment. No pure strategy equilibrium exists. When $R_1 = R_2 = R$, each player chooses an investment at random from the uniform distribution running from zero to R (Hillman and Samet, 1987). If $R_1 > R_2$, on the other hand, player 2 will realize that his optimal investment using this strategy is less than 1's, and thus that his chances of winning are less. This

[5] For an axiomatic characterization of the different types of rent-seeking contests, see Skaperdas (1996).

realization will induce 2 to invest still less than he would if $R_1 = R_2$. Thus, when one player places a much higher evaluation on the prize than do the other players, the other players are discouraged from investing, and the total rent-seeking outlays will be less than under a more equal distribution of payoffs to the rent seekers. Because of this, the government may actually increase its revenue from the rent-seeking contest by designing it in such a way that the player with the highest valuation is ineligible to compete for the prize.

To see this, consider a contest in which the prize is awarded to the player making the highest investment. The values of the prize to each player are $R_1 \geq R_2 > R_3 \geq \ldots R_n$. Baye, Kovenock, and de Vries (1993) have shown that in such a contest the maximum amount that the government can win, W, is given by the following expression:

$$W = \left(1 + \frac{R_2}{R_1}\right)\frac{R_2}{2}. \tag{15.19}$$

Because of the decline in investments by players 2 through n as R_1 increases, W varies inversely with R_1. If now $R_1 = 100$, $R_2 = 50$, and $R_3 = 45$, (15.19) implies that W will be 37.5 with player 1 allowed to bid for the prize, and 42.75 with player 1 excluded from the game. Given the similar evaluations of the prize by players 2 and 3, the increase in their investments caused by player 1's exit from the game more than offsets the loss of 1's investment. One way for the government to exclude player 1 is to run the contest in two stages. The government first announces a "short list" of eligible bidders (importers) for the prize (license), and then allows those on the list to make investments (bribes, campaign contributions, and so on). Player 1 does not make it onto the short list.[6]

15.2 Rent seeking through regulation

The traditional economic rationale for regulation sees the regulated industry as a "natural monopoly" with falling long-run average costs. The classic bridge example is a polar case of the natural monopoly situation. A single bridge is needed and, once built, the marginal cost of allowing additional cars to cross it is zero (crowding aside). The optimal toll on the bridge is then zero. However, if a private firm operates the bridge, it sets the price at the revenue-maximizing level, and the result is a socially inefficient under-utilization of the bridge. Any industry with continuously falling long-run average costs is a "natural monopoly" in the sense that only one firm is needed to supply all of the industry's output. Regulation is said to be needed to restrain that one firm from taking advantage of its monopoly position. In terms of Figure 15.1, regulation is thought to be necessary to help consumers capture some fraction of the consumers' surplus triangle L.[7]

[6] For further discussion and additional examples of the optimal design of rent-seeking contests, see Nitzan (1994c) and Gradstein (1998).

[7] In practice, regulation in the United States has tended to resemble average cost pricing more than marginal cost pricing, so that some welfare triangle losses have occurred even when regulation has worked well (Kahn, 1970).

In the regulatory process, producer and consumer interests are opposed. The higher the price that the regulators set, the bigger the monopoly rent rectangle going to the producers. Since regulation is a political bureaucratic process, it is reasonable to assume that the sellers of a regulated product place some pressure on the regulators to raise price and increase the size of the rectangle. In a seminal contribution to the regulation debate, Stigler (1971) shifted attention away from largely normative discussions of what price should be to minimize L, to a positive analysis of how the struggle to secure R determines price. Although predating the rent-seeking literature, Stigler's paper draws attention to the rent-creating powers of regulators and the rent-seeking efforts of those regulated.

In an important extension of Stigler's argument, Peltzman (1976) integrated both consumers and producers into the rent-seeking struggle. He depicted regulation as being supplied by a vote-maximizing politician. Let V, the number of votes the politician receives, be a function of the utilities of both the regulated producers, U_R, and the consumers of the regulated product, U_C:

$$V = V(U_R, U_C), \qquad \frac{\partial V}{\partial U_R} > 0, \qquad \frac{\partial V}{\partial U_C} > 0. \tag{15.20}$$

For simplicity, assume consumer and regulator utilities are linear in R and L; that is,

$$U_R = R, \qquad U_C = K - R - L, \tag{15.21}$$

where K is an arbitrary constant. Then assuming that the proper second-order conditions hold to ensure an interior maximum, the vote-maximizing regulator sets price, P, to satisfy

$$\frac{dV}{dP} = \frac{\partial V}{\partial U_R}\frac{dR}{dP} - \frac{\partial V}{\partial U_C}\frac{dR}{dP} - \frac{\partial V}{\partial U_C}\frac{dL}{dP} = 0 \tag{15.22}$$

or

$$\frac{\partial V}{\partial U_R}\frac{dR}{dP} = \frac{\partial V}{\partial U_C}\left(\frac{dR}{dP} + \frac{dL}{dP}\right). \tag{15.23}$$

The vote-maximizing regulator sets a price such that the marginal gain in support from the producers for an increment in monopoly rents, R, is just offset by the loss in consumer votes from a combined rise in R and L.

Although most regulated industries are not monopolies, the number of sellers is generally small. It is certainly small relative to the number of consumers. The costs of organizing the producers and the concentration of the benefits, R, on each producer are likely to combine to make $\partial V/\partial U_R$ large relative to $\partial V/\partial U_C$, at least over an initial range of values for R (Olson, 1965; Stigler, 1971; Peltzman, 1976). Stigler (1971) stresses this point in arguing that the main beneficiaries of

regulation are the regulated firms. Price will be raised until dR/dP falls sufficiently far, or $\partial V/\partial U_C$ becomes sufficiently large to bring (15.23) into equality. But note also that as long as $\partial V/\partial U_C > 0$ – that is, as long as there is some loss in votes from reducing consumer utility – (15.23) will not be satisfied at the rent-maximizing price, where $dR/dP = 0$. When $dR/dP = 0$, dL/dP is greater than zero, and that combined with $\partial V/\partial U_C > 0$ makes the right-hand side of (15.23) positive. The vote-maximizing politician may favor the regulated industry's producers, but stops short of setting price at the rent-maximizing level (Peltzman, 1976, pp. 222–41; Becker, 1976). Peltzman derives several interesting implications from his analysis. One is that "*either* naturally monopolistic or naturally competitive industries are more politically attractive to regulate than an oligopolistic hybrid" (1976, pp. 223–4, italics in original). Equation (15.23) implies that regulation brings price to a level somewhere between the pure monopoly and pure competition prices. Assuming oligopoly prices tend to lie intermediate between monopoly and competitive levels, then oligopolists and their consumers have less to gain from regulation than do the consumers of a natural monopoly product or the producers of a competitive product. By this argument, Peltzman helps to explain the ubiquitous regulation of agriculture around the world and other interventions in seemingly competitive industries like trucking and taxicabs in the United States.

Stigler (1971) emphasized the strength of the regulated groups in using the regulatory process to enhance their incomes, and several studies are supportive of this view of regulation (for example, Shepherd, 1978; Paul, 1982; Ulrich, Furtan, and Schmitz, 1987; Alexander, 1997). A classic example of the social costs of rent seeking through regulation was the commercial airline industry in the United States until it was deregulated in the late 1970s. The Civil Aeronautics Board (CAB) controlled price competition, but allowed airlines to compete for customers by offering non-price frills like free drinks, movies, and half-empty planes. The airlines competed away, through additional costs, the rents granted them by the prices that the CAB set (Douglas and Miller, 1974).

Posner (1975) assumed that the entire rectangle R is dissipated through rent-seeking outlays, and then used estimates of the rise in price brought about by regulation to calculate $R + L$ in several industries as a measure of the social costs of regulation. Posner's figures are reproduced in Table 15.2. The η_1 column presents demand elasticities calculated under the assumption that the industry sets price so as to maximize monopoly rents, $(P - MC)/P = 1/\eta$, using the independent estimates of the price rise under regulation. The estimates in the η_2 column are from econometric studies of demand elasticity for the industries. The C_1 and C_2 columns are measures of $R + L$ made using the η_1 and η_2 estimates, respectively. They are all fairly large, both in an absolute sense and relative to existing estimates of the social cost of monopoly in the private sector that rely only on measures of L.

Peltzman (1976) stressed the trade-off between consumer and regulator interests in the final vote-maximizing equilibrium. In trying to test the Peltzman generalization of the Stigler theory, scholars have generally tried to find variables that

Table 15.2. *Social costs of regulation*

	Regulatory price increase (%)	Demand elasticity		Costs (as % of industry sales)	
		η_1	η_2	C_1	C_2
Physician's services	0.40	3.500	0.575	0.42	0.31
Eyeglasses	0.34	0.394	0.450	0.39	0.24
Milk	0.11	10.00	0.339	0.15	0.10
Motor carriers	0.62	2.630	1.140	0.57	0.30
Oil	0.65	2.500	0.900	0.60	0.32
Airlines	0.66	2.500	2.360	0.60	0.19

Source: Posner (1975, p. 84). See original for references to sources for the various estimates.

measure both producer–seller and consumer interests. Leffler (1978), Keeler (1984), Primeaux, Filer, Herren, and Hollas (1984), and Becker (1986) all present evidence consistent with the view that both consumer and producer interests receive some weight in the final regulatory outcomes.

Paul and Schoening (1991) have extended the basic Peltzman model to include third-party rent seeking. They find evidence of third-party rent seeking, and support for the capture theory in their analysis of electricity price regulation. In particular, electricity prices are higher in states where the regulators are appointed than where they are elected. On the other hand, Teske (1991) found that elected commissioners were *more* willing to grant telephone rate changes in response to company requests. His case study of U.S. West does reveal that the firm was a very successful lobbyist, however.

Ippolito and Masson (1978) show that regulation in the milk industry redistributes rents from one group of producers to another, and from one group of consumers to another. Kamath's (1989) study of the regulation of the sugar market in India provides further evidence in support of the capture theory. Wise and Sandler (1994) also find that agricultural interests are able to influence legislation on pesticide regulation, while more diffuse, environmental interest groups were not successful. Salhofer, Hofreither, and Sinabell (2000) estimate the rectangle and triangle losses from rent seeking through agricultural protection in Austria. Although they find that Austrian farmers gain at the consumers' and taxpayers' expense, they find that up- and downstream producers in the food industry gain even more.

Two articles have employed the event-study approach to test for the presence of rent seeking. This approach examines changes in the stock prices of firms affected by regulations at the time that the regulations are announced. Schwert (1977) concluded from the declines in the market values of the major stock exchanges that consumers received substantial redistributive gains from the passage of legislation in the 1930s regulating the stock exchanges.

Beck and Connolly (1996), on the other hand, were not able to identify significant effects on the share prices of companies affected by government actions using a

sample of 48 observations. Their explanation for the lack of any wealth effects from winning a rent-seeking contest is that kickbacks and other investments that the firms make fully offset the rents, which are eventually won. This explanation goes too far, however. Although we have seen that there are many assumptions under which the total outlays of *all* rent seekers may sum to the value of the prize sought, the outlays of the subset that actually wins the prize presumably fall short of it. If not, why would any rational person enter the contest? Beck and Connolly attempt to account for their findings by invoking the winner's curse. This, however, amounts to assuming that rent seekers are not rational.

15.3 Rent seeking and the political process

The Stigler-Peltzman theory of regulation begins with the conflict between the sellers and buyers over price, and analyzes how this conflict might be resolved by the state in response to political pressure from both sides. The two groups involved are easily identified, as are their interests. In other rent-seeking situations, both the identities of the rent-seeking groups and their interests may be more difficult to determine. A more general politico-economic model of the rent-seeking process is required.

Building on a paper by Stigler (1976), McCormick and Tollison (1981) attempt to develop such a model. They make the fundamental assumption that all legislation consists of wealth transfers. Legislatures are organized to transfer wealth efficiently. Each individual or interest group is a potential supplier of wealth transfers, and at the same time a potential demander. The legislature takes from those who are least capable of resisting the demands for wealth transfers and gives to those who are best organized for pressing their demands. Thus, like the Stigler-Peltzman theory of regulation, McCormick and Tollison's (1981, chs. 1–3) theory builds on Olson's (1965) theory of interest group formation.

To succeed in securing a wealth transfer, an interest group must win a majority of votes in both houses of a bicameral legislature. The more seats there are in each house, the more resources that must be devoted to winning legislator votes. Moreover, assuming that there are diminishing returns to securing votes in any house, holding the total number of seats constant, it is easier to win legislator votes the more evenly divided the total number of seats in the two houses is. McCormick and Tollison (1981, pp. 45–55) find that these two variables, number of seats and the ratio of seats in the two houses, are significantly related to the degree of economic and occupational regulation across the states, and to the total number of bills enacted. Campbell (1994) also argues that these two characteristics of New Hampshire's legislature explain its relatively low levels of taxes. McCormick and Tollison go on to analyze the determinants of legislator wages, gubernatorial salaries, and other issues (1981, chs. 4–7).

Complementing the McCormick-Tollison models of government is the theory of the independent judiciary put forward by Landes and Posner (1975). They too see legislators as selling legislation for "campaign contributions, votes, implicit

promises of future favors, and sometimes outright bribes" (p. 877). In this setting, an independent judiciary can increase the value of the legislation sold today by making it somewhat immune from short-run political pressures that might try to thwart or overturn the intent of the legislation in the future. And this is apparently what the founding fathers had in mind when they established an independent judiciary in the Constitution. In the Landes-Posner theory, the first Amendment emerges "as a form of protective legislation extracted by an interest group consisting of publishers, journalists, pamphleteers, and others who derive pecuniary and non-pecuniary income from publication and advocacy of various sorts" (p. 893). By such fruit has the dismal science earned its reputation.

Less jaundiced implications emerge when interest groups are incorporated into the political process using one of the probabilistic voting models discussed in Chapter 12. In these models competition for votes leads each party to propose a platform, which maximizes some form of social welfare function in which all voters' utilities have positive weights. Although interest groups can be viewed as "buying legislation," once campaign contributions and lobbying are introduced into the models, they continue to imply that political outcomes are efficient insofar as they satisfy the Pareto-optimality condition.[8] These models have formed the logical foundation for much of the literature on endogenous trade policy to which we now turn.

15.4 Rent seeking through tariffs and quotas

15.4.1 *The economic effects of tariffs, quotas, and voluntary export restraints*

Few issues elicit greater agreement among economists than the proposition that society's welfare is maximized when there is free trade.[9] Yet tariffs, quotas, and other restrictions on international trade abound, and trade policy is a constant subject of political debate. As with regulation policies, one suspects that the allocative efficiency gains from free trade so obvious to the economist have been sacrificed to provide the equally obvious rents and redistributive gains that restrictions on trade engender.

To see what is involved, consider Figure 15.2. Let S_M be the supply of imports of product X, and S_D the supply of domestic production. S_T and D are the total supply and demand schedules in the domestic country. Under free trade, X_F is purchased at a price P_F, with output divided between domestic production, D_F, and imports, M_F. Now let a tariff be imposed on imports that shifts the import supply schedule including the tariff to S'_M. Total supply shifts to S'_T, and X_R divided into M_R and D_R is sold at a price P_R.

[8] See discussion in Chapter 20.

[9] For a review of the caveats, see Findlay and Wellisz (1986, pp. 221–2).

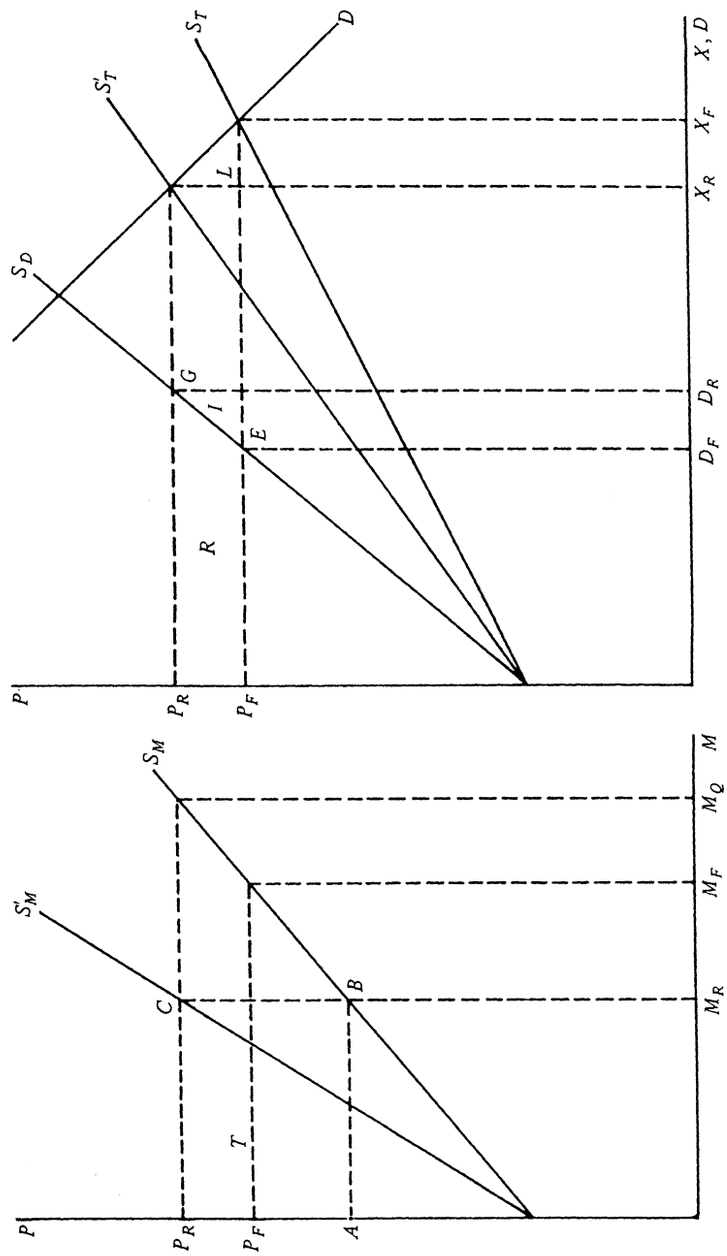

Figure 15.2. Imports and domestic production under tariffs and quotas.

The tariff brings about the welfare loss represented by the consumers' surplus triangle L on the foregone consumption $X_F - X_R$, and the triangle I under the domestic producers' supply schedule generated by the increased domestic output $D_R - D_F$. Triangle I constitutes a social loss insofar as it represents domestic resources used in the production of the additional output $D_R - D_F$ that would not have been needed if X were available at the free-trade price P_F.

In addition to these two welfare-loss triangles, Figure 15.2 depicts the rents earned by the factor owners and producers in the domestic industry, $R(P_R P_F E G)$, and the tariff revenue received by the government, $T(P_R C B A)$. Both R and T represent income flows that might stimulate a demand for the tariff by those in the protected industry or those in government.

The outcome of X_R sold at a price P_R can also be brought about by imposing a quota on imports restricting them to M_R. The domestic industry receives R in rents again, but the rectangle T now represents rents received by the importers "lucky" enough to get licenses for the M_R units of imports. Thus, political pressure from domestic sellers will be the same whether the trade restriction is a quota or a tariff (assuming the same level of imports results), but pressure for quotas will come from importers, while pressure for tariffs will come from those in government or from the eventual beneficiaries of the increase in government revenue.

Tariffs and quotas benefit factor owners in the protected domestic industries and perhaps recipients of import licenses, while at the same time harming producers in the exporting countries. These exporters can be expected to turn to their governments for "relief" from the adverse effects of the tariffs and quotas. The result is likely to be tension between the governments of the affected countries, or charges of treaty violations filed at the World Trade Organization. These unwanted outcomes can be avoided if the importing country chooses a third instrument to protect its producers – a voluntary export restriction, VER. The importing country's government approaches the government of the exporting country and asks it to negotiate with the exporting companies a "voluntary" reduction in exports equal, say, to $X_R - D_R$. The outcome as far as the producers and consumers in the importing country are concerned is exactly as before, but the rectangle T accrues now neither to the government of the importing country as revenue from a tariff nor to the importers, but rather to the companies in the exporting country. By arranging a VER the governments of the two countries have effectively assisted the producers in the two countries in forming a cartel and restricting output. Both governments can expect gratitude from these companies (Hillman and Ursprung, 1988). VERs have grown dramatically over the last two decades and have been estimated to result in protection levels as high as those that could be achieved by an ad valorem tariff of 40 percent (Tarr, 1989).

15.4.2 *Endogenous protection models*

Not all industries receive protection from import competition, and those that do receive it in varying degrees. How can one predict which industries will succeed at

gaining protection? Several studies have sought to answer this question by treating protection as an endogenous variable in models, which try in some way to account for the influence of political factors.[10] In one such model Grossman and Helpman (1994) seek to explain the "sale of protection" with a model in which the government is assumed to maximize a weighted sum of the utilities of all citizens plus the political contributions of the lobbyists seeking protection. This objective function is very similar, of course, to the one that one obtains as a result of political competition in the probabilistic voting models. And it leads to similar results in terms of the implied efficiency of the protectionist outcomes. The welfare loss triangle L in Figure 15.2 will be smaller, the more inelastic the domestic demand for the product is, and thus their model predicts, ceteris paribus, higher tariffs on products with more inelastic demand schedules. Not surprisingly, it also predicts higher tariffs in industries in which interest groups are well organized.

Goldberg and Maggi (1999) found support for these and the other predictions of the model using 1983 data for 3-digit SIC industries in the United States. Their measure of protection is the level of nontariff trade barriers, while their measure of interest group strength is a dummy variable defined according to whether an industry's campaign contributions were above or below $100 million in 1981–2.

A study of protection that is somewhat more closely related to the rent-seeking literature is that of Lopez and Pagoulatos (1994). They first estimate the size of the rent-seeking rectangles, R and T in Figure 15.2, and then relate these to political action committee (PAC) contributions. They find a positive and highly significant relationship. The more industry PACs give to politicians, the larger are their rents from tariff protection.

Where Goldberg and Maggi (1999) and Lopez and Pagoulatos (1994) both relate measures of actual protection to PAC contributions, other studies have related the way congressmen vote on protectionist legislation to the levels and sources of their PAC contributions. Baldwin (1985, pp. 59–69) examined the effect of union contributions to congressmen on their vote on the Trade Act of 1974; Coughlin (1985) examined the effect of contributions from labor on congressional voting on the Automotive Products Act of 1982, a piece of domestic content legislation; and Tosini and Tower (1987) analyzed the effect of contributions by interest groups from the textile industry on congressional voting on the Textile Bill of 1985. All three studies found a positive and significant effect of the size of political contributions from the interest group, and the probability that a congressman voted in favor of the protective legislation. Other significant variables in these studies measure the importance of the industries that would be protected in the congressman's district or state, the unemployment rate in the state, and the congressman's party affiliation.[11]

Following earlier studies Lopez and Pagoulatos (1994) also include a measure of industry concentration in their model. This variable's inclusion can be justified

[10] See in particular Findlay and Wellisz (1982); Mayer (1984); Hillman (1982, 1989); Magee, Brock, and Young (1989); Vousden (1990); and Trefler (1993).

[11] See also the review of the effects of PAC contributions on congressmen's votes in Chapter 20.

on two grounds: first, the more highly concentrated an industry, the easier it is to organize and thus the more effective its lobbying may be (Olson, 1965). Second, the more concentrated an industry, the easier it is for its producers to raise prices and take advantage of a reduction in competition from foreign producers. In addition to Lopez and Pagoulatos, studies by Pincus (1975), Marvel and Ray (1983), Godek (1985), and Trefler (1993) have also found tariffs to be higher in concentrated industries. Caves (1976) and Finger, Hall, and Nelson (1982) found industry concentration to be negatively related to tariff protection, however.

The same logic that predicts a positive correlation between seller concentration ratios and trade protection leads one to expect a negative correlation between buyer concentration and protection, and this too has been observed (Pincus, 1975; Trefler, 1993).

The Olsonian argument about group size and effectiveness in organizing receives further support from the fact that farmers receive more protection in the developed countries where they are small in number than in the developing countries where their numbers are large (Balisacan and Roumasset, 1987). The generally higher levels of tariffs in consumer goods industries further support the Olsonian argument (Baack and Ray, 1983; Marvel and Ray, 1983; Ray, 1991).

While consumers generally tend to be poorly organized, workers are often very well organized, and thus it is not surprising to find that tariff protection tends to be higher for labor-intensive industries (Caves, 1976; Anderson, 1980; Saunders, 1980; Ray, 1981, 1991; Marvel and Ray, 1983; Dougan, 1984; Baldwin, 1985).

These studies reveal that the political process responds to interest group pressure by offering trade protection. They do not answer the question, however, of whether this protection "merely" results in transfers to the favored factor owners, or whether it induces investments that dissipate the transfers. In her pioneering article, Krueger (1974, pp. 52–4) enumerated the many forms of social waste that can arise when governments "sell protection": (1) construction of excess plant capacity, when licenses are awarded in proportion to firms' plant capacities; (2) excessive entry and therefore less than optimal-sized firms, when licenses are allocated pro rata to applicants; (3) lobbying efforts and bribes in the form of hiring relatives of customs officials who are less productive than their earnings, to obtain import licenses; and (4) the wasteful competition among those in the government to be in a position to receive bribes.

Krueger presented data on the rents generated from several categories of licenses in India, the largest of which was imports, indicating a potential loss from rent seeking in 1964 of 7.3 percent of national income. Figures for 1968 for import licenses in Turkey implied a waste of resources equivalent to 15 percent of GNP (Krueger, 1974, pp. 55–7). As with Posner's calculations, these estimates are rough, but nonetheless impressive.

In the rent-seeking model of a natural monopoly, we start with the monopoly already in existence, and the issue is simply how much of its monopoly position it exploits and whether the rents are fully dissipated. The natural starting point when thinking about rent seeking through trade protection is, however, perfectly free trade. From this starting point trade protection results in both Harberger-triangle

losses and potential rent-dissipating investments. If the latter are sufficiently large to dissipate the full, potential rent, then the social costs from rent seeking through trade protection exceed the size of the rectangle.[12]

15.4.3 *Remaining puzzles*

The bulk of the endogenous trade policy literature begins with the assumption that governments use trade policy to redistribute income to certain groups, and then tries to explain which groups will be so favored and to what degree. In his excellent survey of this literature, Rodrik (1995) raises two troublesome questions. If the goal of trade policy is to redistribute rents and incomes, why do governments choose such an inefficient policy instrument to achieve this goal instead of relying, say, on direct income transfers and tax cuts, production subsidies, and the like, which generally have much smaller deadweight losses associated with them? Why do governmental interventions with free trade so overwhelmingly take the form of *restrictions* on trade like tariffs and quotas instead of stimuli to trade like export subsidies, given that the latter often dominate trade restrictions in terms of efficiency? Rodrik reviews the scant number of rational choice models that has addressed these two questions, but fails to come up with satisfactory answers.

The questions Rodrik raises with respect to trade policies are essentially the same questions public finance economists have raised for many years about the simultaneous popularity and inefficiency of in-kind transfers in comparison to cash transfers as a way to redistribute income. My personal hunch is that to answer these questions fully, one must step outside of the narrow bounds of rational choice models.

One might begin, for example, with the "irrational" asymmetry between the weights people place on a given loss in income relative to an equivalent gain in income (Kahneman and Tversky, 1979, 1984). This asymmetry would lead one to expect that people would lobby much more vigorously to reverse a loss of income caused by an expansion of imports than they would to obtain an increase income from an export subsidy. A related psychological factor is a sort of "Duesenberry effect" of subsidies. People become accustomed to a subsidy and lobby much more vigorously against its removal than they do for its introduction. These psychological regularities fit nicely with several of the "stylized facts" of trade policy: (1) trade protection is often a response to invents that adversely affect certain groups or industries like a sharp drop in the price of an imported good or a recession (Kurth, 1979; Takacs, 1981; McKeown, 1983; Ray, 1987; Magee, Brock, and Young, 1989, ch. 11; Hansen, 1990; Trefler, 1993; Rama, 1994; O'Halloran, 1994); (2) actual levels of trade protection or efforts to obtain relief are positively related to unemployment rates both over time and cross-sectionally (Takacs, 1981; Magee, 1982; Baldwin, 1985, pp. 142–80; Bohara and Kaempfer, 1991; Schuknecht, 1991; Trefler, 1993; Das and Das, 1994); and (3) the "path dependence" of trade protection. Once a trade

[12] It is possible, however, when one starts in a second-best situation, that rent seeking can sometimes improve welfare, as, for example, by eliminating a trade barrier (Bhagwati and Srinivasan, 1980; Bhagwati, 1982).

restriction is put into place, it tends to persist over time (Brainard and Verdier, 1997; Gardner and Kimbrough, 1989).

It should be noted that to the extent that irrational behavior is part of the explanation of the pervasive use of trade restrictions to redistribute income, it is only the behavior of those seeking compensation that is irrational in that they appear to *over*react to certain adverse events. The political response in catering to this lobbying effort may be perfectly rational – that is, vote-maximizing – on the part of the parties in government. Indeed, because of the difficulty of identifying and quantifying the losses to individual factor owners from events like a sharp drop in the price of an imported good, a tariff or quota may be the lowest cost way of channeling the redistribution to the "right" recipients (Feenstra and Lewis, 1991).

15.5 Rent seeking in other governmental activities

Regulation and trade restrictions are but two ways in which government alters the distribution of income. Direct transfers are a third, and they too can give rise to investments to change their size and the direction of their flow (Tullock, 1971d). More generally, Aranson and Ordeshook (1981, pp. 81–2) stress that even the production of a good with public good characteristics, like a highway, has distributional effects that may significantly influence the collective decision to provide the good:

> A larger view of production would embrace the idea that some contractor must build a road to the exclusion of other contractors. Some concrete manufacturer receives a subcontract while other manufacturers do not. Some bureaucrats must receive the wages for planning and overseeing construction, while another bureaucrat (or his agency) or even private sector taxpayers do not. And, those who speculate correctly on land in one area gain a windfall over those who speculate incorrectly elsewhere. In sum, a federally funded interstate highway system in production can be much like a private good; its supply is limited and subject to exclusion.

The entire federal budget can be viewed as a gigantic rent up for grabs for those who can exert the most political muscle.

The distributional consequences of government contracting can be expected to influence the flow of lobbying and campaign expenditures as in the rent-seeking models. Campaign expenditures should come from those seeking government contracts, and contracts should flow to those making contributions. Zardkoohi (1985) has found that the amount of campaign contributions a firm makes is positively and significantly related to the percentages of federal and state government outputs purchased by the firm's industry, and whether or not industry-specific regulation was applicable to the firm's industry. Wallis (1986) found that in the 1930s large states used their numerical advantages in the House to garner greater shares of federal relief programs than the Senate was willing to award them. Not surprisingly, those who work in the government also participate in the rent-seeking game. Waters and Moore (1990) have shown that the passage of state laws favoring public sector employees is positively related to measures of the strength of public employee

Table 15.3. *Estimates of the welfare losses from rent seeking*

Study	Economy	Year	Welfare loss
Krueger (1974)	India	1964	7% GNP
Krueger (1974)	Turkey	1968	15% GNP (trade sector)
Posner (1975)	United States	various years	3% GNP (regulation)
Cowling and Mueller (1978)	United States	1963–6	13% GCP[a] (private monopoly)
Cowling and Mueller (1978)	United Kingdom	1968–9	7% GCP[a] (private monopoly)
Ross (1984)	Kenya	1980	38% GDP (trade sector)
Mohammad and Whalley (1984)	India	1980–1	25–40% GNP
Laband and Sophocleus (1988)	United States	1985	50% GNP
Lopez and Pagoulatos (1994)	United States	1987	12.5% of domestic consumption

[a] GCP = gross corporate product.

Source: Adapted from Tollison (1997, Table 1, p. 514).

unions and inversely related to the strength of those interest groups which oppose them.

15.6 How large are the welfare losses from rent seeking?

Estimates of the welfare losses from rent seeking divide themselves into two categories. One set proxies the welfare losses by the areas of the profit rectangles and welfare triangles caused by tariffs or market power, or uses other proxies like increases in government spending. These estimates tend to be quite large ranging up to 50 percent of GDP. A few illustrative examples are given in Table 15.3.

A second group of studies uses the money actually spent on lobbying and the like. These studies have come up with estimates suggesting that the welfare losses are tiny fractions of the rents involved. For example, Dougan and Snyder (1993) calculate that federal oil regulation in the 1970s resulted in a net welfare-triangle loss of some $1.1 billion. The combined lobbying outlays of the interest groups affected by the regulation was estimated to be $125 million – 11 percent of the *triangle* loss.[13]

A similar conclusion can be drawn from Goldberg and Maggi's (1999) estimates for the Grossman/Helpman model. Recall that this model presumes that the government maximizes a weighted sum of the utilities of all citizens and the outlays of the interest groups. Goldberg and Maggi's estimates imply a weight of 0.98 on the welfare of the citizens, and 0.02 on that of the interest groups. These weights appear less surprising when one recognizes that impediments to international trade in the

[13] See also Tullock (1988).

United States are on average rather low. Although rent seeking through protectionist measures occurs and it has the predicted consequences, its effects do not appear to be very significant.

Before one removes rent-seeking costs entirely from one's list of social inefficiencies, however, one must recall that the outlays of those who successfully obtain rents are only a part of the social waste from rent seeking. To the investments of the successful rent seekers in the petroleum industry, one must add the outlays of unsuccessful rent seekers in other industries who were encouraged to try their luck after observing government policies in this industry. Moreover, the wealth changes that government policies bring about induce additional investments by those who try to anticipate these changes and profit from this knowledge. When the defense department announces that General Dynamics has won the competition for a particular weapons system and Boeing has lost, the typical stock market reaction is a rise in the price of General Dynamic's shares and a fall in the price of Boeing's shares. Anyone with knowledge of this contract decision before it is announced can earn a handsome profit on the stock market, even though she has no direct stake in the rents distributed by the government. The investments in information gathering to *anticipate* rent transfers must be added to the investments made to bring them about when calculating the full costs of rent seeking (Hirshleifer, 1971; Tollison, 1989.)

This latter example reminds us that rent seeking does not only occur in the public sector, and any attempt to estimate the total costs of rent seeking in the economy must include the costs of rent seeking in the private sector. An army of stockbrokers and analysts exists on Wall Street and elsewhere throughout the country. Billions of dollars are spent gathering information about companies so that investors can choose the "right companies" for their portfolios. Although an efficient capital market does lower the cost of capital to firms seeking capital on the equity market, only a small fraction of each year's annual investment by companies is financed through new issues of stock. Over 95 percent of the shares traded are not new issues. Any gain that a trader makes by buying shares in the "right company" is offset by a loss suffered by the person who sold the shares. The fact that some companies earn large rents and these rents fluctuate over time leads to tremendous investments in time and money by those who try and anticipate these changes and profit from them.

Cowling and Mueller (1978) included all corporate advertising in their estimates of the social costs of monopoly. Some advertising does inform buyers about certain characteristics of a product and improves the allocation of resources; thus, all advertising cannot be regarded as a social waste. But a great deal of advertising is intended merely to redistribute the rents being earned by companies in a given market. Some nontrivial fraction of all corporate advertising must be regarded as rent-seeking investments.

The same can be said for some fraction of R&D expenditures, and for the patent lawyer fees that make R&D profitable. Indeed, a large fraction of the activities of *all* lawyers can be regarded as pure rent seeking. Rent seeking by lawyers has been linked to slow economic growth (Courbois, 1991). Rama (1994) has also

shown that rent seeking via trade protection has had adverse effects on economic growth in Uruguay, albeit with a considerable lag. More generally, the evidence that the size of the government sector is inversely related to growth rates in the developed countries can be interpreted as evidence of the costs of rent seeking to the extent that rent seeking produces larger government sectors (see discussion in Chapter 22).

This observation suggests an alternative procedure for estimating the welfare losses from rent seeking in a society to those commonly employed. One could go through the national income accounts and identify all activities that are solely or primarily related to rent seeking. Such an exercise would produce a list that goes well beyond the lobbyists and people involved in political advertising. Although one cannot imagine a healthy capitalist economy without any stock analysts, lawyers, corporate advertising, and the like, it seems equally obvious that the tremendous rents generated by an economy like that of the United States have produced an equally impressive number of rent seekers.

In closing this chapter, it is interesting to compare the approach to measuring the social costs of rent seeking just described with the attempt by Phillips (1966) some time ago to measure "the social costs of monopoly capitalism." He too proceeded by adding different items from the national income accounts. His criterion was different, however; namely, activities that existed under monopoly capitalism that would not exist in an ideal socialist state. Thus, he included all defense expenditures, since in 1966 these were solely intended to protect American capitalism from Soviet communism. Although most public choice scholars would probably regard *some* of the defense budget as providing a pure public good, most would also probably agree with Aranson and Ordeshook (1981) that some fraction is also simply due to rent seeking.

Interestingly, Phillips (1966) included all the income of lawyers as part of the social cost of monopoly capitalism. This item would, as already noted, also figure prominently in any complete inventory of the social costs of rent seeking. Phillips also included all advertising. When he finished his list summed to 50 percent of GDP – a figure which matches the largest of those that have been estimated in the rent-seeking literature.

Bibliographical notes

The seminal contributions of Tullock (1967c) and Krueger (1974) along with several others have been brought together in a rent-seeking anthology by Buchanan, Tollison, and Tullock (1980).

Tollison (1982, 1997) and Nitzan (1994b) have surveyed the rent-seeking literature. The public choice literature concerning the determinants of protectionism has been reviewed by Frey (1984, chs. 2 and 3; 1985 in German; 1985, chs. 2 and 3); Nelson (1988); Hillman (1989); Magee, Brock, and Young (1989); Rodrik (1995); and Magee (1997). Bhagwati and Rosendorff (2001) collect some of the major contributions in this literature.

To the extent that bribes are pure transfers, they do not strictly belong to the wasteful rent-seeking category. But they do belong to the seamy tail of the distribution of activities rent seekers pursue. Hillman and Ursprung (2000) show how rent seeking in the form of bribes and corruption can lead to a nation's economic decline. Rose-Ackerman (1978, 1999) analyzes corruption from a public choice perspective. Her books are good complements to the rent-seeking literature.