The Impact of Consumers on the Dissipation of Economic Rents

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INTRODUCTION

Much of the work on rent-seeking activities of potential monopolists has focused on producers and neglected consumer reactions. In addition to the welfare, or Herberger (1954), losses induced by monopolization, mast, and perhaps all, of the economic rents are dissipated by competitive producer behavior in seeking the monopoly rents (Becker [1968], Corcoran and Kules [1985], Forrester [1981], Higgins et al. [1983], Forrester [1975], and Tullock [1967, 1979]). Tullock (1987) noted that, depending upon assumptions made about the number of players and the marginal cost of influencing the probability of winning, total rent-seeking producer expenditures can be greater, equal to, or less than the winner's economic rents. Corcoran (1983) emulated Tullock's by demonstrating that in a long-run setting with Tullock's model, rents will be exactly dissipated. 1

Recently, Wenders (1987) considered the possibility that inclusion of parallel rent-defending activity by consumers might more than double the minimum welfare costs of regulation. Those rent-defending activities are intended to avoid regulation and the consommant increase in price. However, Wenders did not examine those rent-defending activities in the same probabilistic sense that Tullock and Corcoran did.

This paper focuses on the impact that a consumer-player has on total rent-seeking and rent-defending activities. Section II considers the impact of the consumer-player in the Tullock model. Section III does an analogous job in the context of the Corcoran model. Section IV elaborates on a more general long-run model where firms and the consumer-player are not assumed to be identical. An important condition that emerges from this paper is that the inclusion of a consumer-player may not increase total rent-seeking and rent-defending expenditures very much and, in some cases, may actually decrease those total expenditures.

THE IMPACT OF THE CONSUMER-PLAYER IN THE TULLOCK MODEL

Following the Tullock model assume that there are "n" potential producers, that their expenditures are given as \( x_i, i = 1, \ldots, n \), that consumers act together as one player and that consumers' expenditures are given as \( c \). Let potential economic rents be \( X \) and the potential loss in consumer welfare be \( Y = X + T \) where \( T \) is the Herberger welfare triangle. Thus, each producer has \( X \) at stake, and consumers have \( X + T \) at stake.

The probability of firm "$i" winning is then given as

\[
P_i(n) = \frac{q_i}{\sum_{i=1}^{n} x_i + c}
\]

and the probability of consumers winning is given as

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\[ P(c) = c' / \left( \sum_{i=1}^{n} d_i + c' \right) \]

where \( r \) reflects the marginal cost of influencing the probability of winning. Note that a "win" for a producer is obtaining the regulated monopoly franchise, with its concomitant economic rents, while a "win" for consumers is no granting of a regulated monopoly franchise and, therefore, no consumers' welfare losses associated with the higher regulated monopoly price, as compared with the lower unregulated price. From the individual firm's perspective, a loss to another firm is no different than a loss to consumers. In both cases, the firm fails to obtain the economic rents. Likewise, consumers are indifferent as to the winning firm. For firm \( i \), the expected profits are

\[ E_i(p) = \left( d_i / \sum_{j=1}^{n} d_j + c' \right) Y - a_i \]

For consumers, the expected profits (or losses) are

\[ E(c) = \left( 1 - \left( e' / \sum_{j=1}^{n} d_j + c' \right) \right) Y - c \]

Consumers are in a position of minimizing losses since the expected gain will always be negative. The Cournot-Nash profit-maximizing solution for firm \( i \) is

\[ \left( d_i / \sum_{j=1}^{n} d_j + c' \right) = \left( e' / \sum_{j=1}^{n} d_j + c' \right) \]

If producers are all alike in their behavior as players then \( a = 0 \) for all \( i \) and (1a) becomes

\[ \left( \left( e' - 1 \right) a / \sum_{j=1}^{n} d_j + c' \right) \sum_{j=1}^{n} d_j + c' = 1 \]

The Cournot-Nash profit-maximizing solution for consumers is

\[ \left( \left( e' - 1 \right) a / \sum_{j=1}^{n} d_j + c' \right) \sum_{j=1}^{n} d_j + c' = 1 \]

where \( a = 0 \) for all \( i \).

Emotively, we might expect that with the addition of the consumer-player and a non-zero Harberger triangle the sum of rent-seeking and rent-defending expenditures would increase. However, that is not the case.

We can take the case of two producers, with rent-seeking expenditures of \( a_1 \) and \( a_2 \), and one consumer with rent-defending expenditures of \( c \). If we totally differentiate Eqs. (1a), for \( i = 1, 2, \) and (2) with respect to \( a_1, a_2, c, \) and \( T \), the impact of \( T \) on \( a_1, a_2, c, \) and can be approximated by evaluating \( \partial a_i / \partial T, \partial c / \partial T, \) and \( \partial T \) at \( T = 0 \). Let \( M = \partial a_i / \partial T, c = \partial a_i / \partial c, \) and \( P = \partial T / \partial c \). Note that when \( T = 0, a_1 = a_2 = c \). Also, \( M / a_1 = a / a_1 = a / a_2 = a / a_2 \). Total differentiation of Eqs. (1a) and (2) yields

\[ \begin{bmatrix} \alpha & \beta & \gamma & \delta \end{bmatrix} \begin{bmatrix} a_1 \ a_2 \ c \ end{bmatrix} = \begin{bmatrix} 0 \ 0 \ 0 \ \tau \end{bmatrix} \]

Solving for \( a_1, a_2, c, \) and \( T \) produces

\[ \begin{bmatrix} \alpha & \beta & \gamma & \delta \end{bmatrix} \begin{bmatrix} a_1 \ a_2 \ c \ end{bmatrix} = \begin{bmatrix} 0 \ 0 \ 0 \ \tau \end{bmatrix} \]

Substituting Eq. (3) into Eqs. (4) and (5) and canceling terms yields

\[ P(c) = a' \left( \left( e' - 1 \right) - a / \sum_{j=1}^{n} d_j + c' \right) \sum_{j=1}^{n} d_j + c' \]

where \( a = 0 \) for all \( i \).

We can see that the result obtained in the Corcoran model is no consumer-player, and in particular, when \( T = 0, a = c, \) the total value of rent-seeking and rent-defending expenditures is equal to \( X \). Also, note that the value of \( u \) is not dependent on \( T \), and that \( v > 1 \) as in Corcoran.

Let

\[ R = \left( \left( e' - 1 \right) a / \sum_{j=1}^{n} d_j + c' \right) Y - 1 \]

We can totally differentiate Eqs. (4) and (5) with respect to \( a, c, \) and \( T \) to obtain

\[ \begin{bmatrix} \alpha & \beta & \gamma & \delta \end{bmatrix} \begin{bmatrix} a_1 \ a_2 \ c \ end{bmatrix} = \begin{bmatrix} 0 \ 0 \ 0 \ \tau \end{bmatrix} \]

As before, we can approximate the impact of \( T \) on \( a \) and \( c \) in the Corcoran model by evaluating \( \partial a / \partial T \) and \( \partial c / \partial T \) at \( T = 0 \). At that value, \( a = c \) and

\[ (a_1) = a \left( \left( e' - 1 \right) \Phi \right) \]

\[ (a_2) = a \left( \left( e' - 1 \right) \Phi \right) \]

\[ (c) = a \left( \left( e' - 1 \right) \Phi \right) \]

\[ (T) = a \left( \left( e' - 1 \right) \Phi \right) \]

\[ (\partial a / \partial T) = a \left( \left( e' - 1 \right) \Phi \right) \]

\[ (\partial c / \partial T) = a \left( \left( e' - 1 \right) \Phi \right) \]

\[ (\partial T / \partial a) = a \left( \left( e' - 1 \right) \Phi \right) \]

\[ (\partial T / \partial c) = a \left( \left( e' - 1 \right) \Phi \right) \]

\[ (\partial T / \partial T) = a \left( \left( e' - 1 \right) \Phi \right) \]
where \( \Phi \) is the determinant of the matrix on the left-hand side of Eq. (6). It can be shown that at \( T = 0 \) and \( a = c, \Phi > 0 \). Since \( r > 1 \), this implies that \( \delta(T) < 0 \) and \( \delta d(T) > 0 \). As the size of the Harberger triangle increases, the number of rent-seeking firms decreases.

Finally, we can solve for the change in the total amount of rent-seeking and rent-defending expenditures with an increase in \( T \) from \( T = 0 \). This is given as

\[
\begin{align*}
&B(a(T)X') + c(X')X + [(n+1)c]X' \Phi X'
+ [(n+1)c]X' \Phi X
+[(n+1)c]X' \Phi X

&= [r(n+1)c]X' \Phi X'
\end{align*}
\]

Since \( r > 1 \) the above expression is negative and the inclusion of the consumer-player in the Corcoran model decreases the amount of rent-seeking and rent-defending expenditures. Although \( c \) increases as \( T \) increases from 0, the decrease in \( "n" \) more than offsets that. To summarize, when \( a = c, \) that total expenditure is \( X \) (perfect rent cessation). With a consumer-player and an increase in \( T \) from \( T = 0 \), those expenditures are then less than \( X \), which means that, in the context of the Corcoran long-run model, rents are not totally dissipated.

THE GENERAL LONG-TERM MODEL WITH NON-IDENTICAL PLAYERS

Consider a general long-term model, not necessarily of the Corcoran variety, where the firms and consumers are not identical in their behavior. We seek to determine the impact of the consumer-player on the total amount of rent-seeking and rent-defending expenditures. While the exact amount of those expenditures cannot be specified in general, limits can be placed on those expenditures. To provide us with a starting point, we consider a model without a consumer-player. Assume that the long-term solution is to use rent-seeking firms where \( \Phi = 0 \), and \( 1 \leq n \leq \infty \), represents the probability that firm \( "n" \) wins. In the long-run, firm \( "n" \) will seek rents as long as \( \Phi \geq 0 \). Therefore, the amount of rent-seeking expenditures is \( \sum \Phi \), which are equal to \( X = X \). If at least one firm's long-term expected profits are greater than zero (which is likely if the firms are non-identical), rents are not totally exhausted.

Let us now consider the addition of a consumer-player with a probability of winning of \( \Theta \). The consumer-player will not defend rents in the long-run unless \( \Theta \geq \Phi \). The sum of rent-seeking and rent-defending expenditures is

\[
\sum \Phi + c \sum \Theta \Phi \Theta \equiv X = \Phi + \Theta, T
\]

Wendler alleged that the maximum amount that consumers and producers would spend is \( 2X + T \) in his binary regulatory model. However, as seen here, the maximum amount is less than or equal to \( X + T \). In particular, as we decrease the probability that the consumer-player wins, that upper limit decreases.

CONCLUSION

Intuitively, it is assumed that the inclusion of a consumer-player, who acts to defend rents, in a rent-seeking model will increase total rent-seeking and rent-defending expenditures. However, that is not necessarily the case. We have demonstrated that in a Tullock model with two producers, the inclusion of a consumer-player, and a non-zero Harberger triangle, may actually decrease total rent-seeking and rent-defending expenditures. Thus, in the short-run model, it cannot be assumed that the total expenditures will necessarily increase.

In the Corcoran model, the introduction of the consumer-player and a non-zero Harberger triangle results in a decrease in total rent-seeking and rent-defending expenditures. These expenditures are less than the amount of economic rents at stake. This occurs because, while the long-term value of "a" does not change, there is a decrease in the number of producers, which more than offsets the increase in the long-term amounts of consumer expenditures.

REFERENCES


