Long-Run Equilibrium and Total Expenditures in Rent-Seeking: A Comment

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Long-run equilibrium and total expenditures in rent-seeking: A comment

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Although Corcoran is mathematically right, I believe his comment is not very helpful. In order to discuss the matter in some detail, I have reproduced here Table 1 from my 'Efficient Rent-Seeking.'[1] This shows the equilibrium investment of each individual, different numbers of individuals playing the game (n), and differing values of r. Table 2, also reproduced (ibid.), shows the total investment.

Corcoran assumes that in a dynamic process the profits would be exhausted, i.e., that people would enter or leave until such time as there was no profit in doing so. In his equation 7, he calculates the number of entrants necessary to meet this condition. I have no complaints about his algebra, but as I shall point out below, equation 7 is not very helpful.

In terms of Tables 1 and 2, if individuals are able to enter, they have an incentive to enter as long as the value in Table 1, for the appropriate values

Table 1. Individual investments (N-person, no bias, with exponent)

	Number of players				
Exponent	2	4	10		15
1/3	8.33	6.25	3.00		2.07
1/2	12.50	9.37	4.50	I	3.11
1	25.00	18.75	9.00		6.22
2	50.00	37.50	18.00		12.44
3	75.00	56.25	27.00		18.67
5	125.00	93.75	45.00	II	31.11
8	200.00	150.00	72.00		49.78
12	300.00	225.00	108.00		74.67
		III			

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1. 'Efficient rent-seeking,' in *Toward a theory of the rent-seeking society*, edited by James M. Buchanan, Robert D. Tollison, and Gordon Tullock, 1980, pp. 97–112. College Station: Texas A&M University Press.

Table 2. Sum of investments (N-person, no bias, with exponent)

Exponent	Number of players 2	4	10	15		Limit
1/3	16.66	25.00	30.00	31.05		33.30
1/2	25.00	37.40	45.00	46.65	I	50.00
1	50.00	75.00	90.00	93.30		100.00
2	100.00	150.00	80.00	186.60		200.00
3	150.00	225.00	270.00	280.05		300.00
5	250.00	375.00	450.00	465.65	II	500.00
8	400.00	600.00	720.00	746.70		800.00
12	600.00	900.00	1,080.00	1,120.05		1,200.00
			III			

of n and r, is less than $\frac{1}{n}$. For any given value of r, the total return to rent-seeking with equilibrium entry, is 1 (the 'prize') minus the total investment (the value in Table 2 at the given value of r and the last value of n for which total investment is ≤ 1. It may be noted that the total return to rent-seeking is not generally zero. Consider first situations in which r is less than 1. Corcoran says 'If $r \leq 1$ entry is unbounded.' (The solution to equation 7 is a negative number of people.) In this case it is clear that the profits are not exhausted, as can be seen from my Table 2. If r is one-third, then even if an infinite number of people choose to play, only one-third of the profits will be exhausted.

Turn next to the case where r is between 1 and 2. It is in this case that I think Corcoran makes what contribution his article does make. If, for example, r is 1.5 then n is 3, and it does seem to me quite likely that entry would proceed until such time as three people had entered, at which point profits would be exhausted. Suppose, however, that r is 1.6. Then n is 2 2/3. But the number of entrants must be an integer.

If only two people have entered there are profits for that collectivity of two, whereas a third entrant will guarantee for himself and his predecessors net losses. It is also not possible for two people to enter in full, and the third person to put in only two-thirds as much as they have because it would be a losing bet for the third person.

When $r > 2$, all solutions lie with some number between 1 and 2 playing the game. Thus, entry would cease with one entrant, who would have positive profits.

For the benefit of those who have not read my original article, it will be noted that there are lines in Table 2 dividing the parameter space into categories 1, 2, and 3. Categories 2 and 3 raise the problem that it doesn't seem sensible to play these games but, on the other hand, refraining from playing them guarantees very large profits to the one person who does play. Thus there is another game in the precommitment stage, in which the parties attempt to make the first commitment so that no one else will enter. This other game must be investigated, and it seems to me that the major value of Corcoran's paper is in laying out some of the framework in which this precommitment game would be played.

It should be kept in mind that although an economist is annoyed to discover opportunities for true profit in a competitive economy, that is merely an intellectual problem. The real problem of rent-seeking is the waste of resources. We don't want the rent-seeking cost to work out to the same as the benefit. We would much prefer that the benefit come at zero rent-seeking cost, and if that is not possible that the cost at least be low.

So much for Corcoran. I should like to take this opportunity to clear up some loose ends on the original article on which he comments. Turning back to Tables 1 and 2, in the article, 'Efficient Rent-Seeking,' I said that in zones 2 and 3, as shown on the figure, 'There is no stable solution (page 103). I was more correct than I realized. I had made only a partial check of the second order conditions and it turns out that for the bulk of the numbers in zones 2 and 3, specifically those where $r<\frac{n}{n-2}$, the second-order conditions for mutual maximization are not met. Thus we really should have had zones 2, 3, and 4, but what I have said about zones 2 and 3 would remain true respect to 2, 3, and 4.

Although it makes no practical difference in the outcome, it may be of some interest to explain how I came to make this mistake. Because of the way in which our research proceeded, I began by establishing that all of the two-person equilibria were stable. There were a few tests of individual outcomes in other areas, but unfortunately I chose, in order to simplify my work, those in which the exponent was 1. Thus the area of instability was missed.

With respect to Tables 3 and 4, having to do with two persons, biased processes, there are corrections of two sorts that must be mentioned. First, due to an error in the calculation procedure, the numbers are correct only if the column headings are reinterpreted as b_r, rather than b. For the second-order conditions to be satisfied the bias factor must be between $\frac{r-1}{r+1}$ and its reciprocal. Thus, bias has an even greater impact in reducing rent-seeking than I suggested.

But although in this case the failure to check the second order conditions thoroughly turned out to be irrelevant, I certainly don't believe we could always count on that. To repeat the advice which you hear so often but which is unfortunately frequently disregarded, always check the second order conditions.