Collusion and rent-seeking*

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Submitted 21 September 1989; accepted 15 December 1989

1. Introduction

The possibility of obtaining a monopoly franchise and its associated rents leads firms to invest resources in improving their chances of winning the franchise. Rent-seeking, as modeled by Rogerson (1982) and Tullock (1980), involves firms noncooperatively bidding for the rent, which is awarded to a firm with probability equal to its share of the total bids. This paper examines the possibility of collusion in rent-seeking.

The mechanism for collusion involves all firms but one in the colluding coalition refraining from rent-seeking expenditures, while the other colluding firm chooses expenditures to maximize the coalition's payoff. Side payments make such a scheme potentially attractive to all coalition members. The reduction in rent-seeking expenditures by colluding firms bestows an external benefit on non-colluding firms, which receive an increased probability of winning the rent even if they do not respond to the existence of collusion.

Collusion among otherwise competing firms is frequently illegal, creating incentives to keep collusion secret. The profitability of collusion in rent-seeking is analyzed under various assumptions concerning the knowledge that non-colluding firms possess about the degree of collusion. The public good aspect of the collusive gains reduces the circumstances in which collusion is privately profitable. Perfectly anticipated collusion is only profitable for coalitions that approach the size of the grand coalition. The profitability of collusion to the colluding firms is shown to rise as the non-colluding firms become less suspicious of the existence of collusion. This suggests that even if collusion in rent-seeking is legal, firms may attempt to conceal its existence from non-colluding firms. If rent-seeking expenditures represent social waste, then the

*We would like to thank Joseph E. Harrington, Jr., for helpful comments. All errors remain the responsibility of the authors.
reductions in rent-seeking expenditures that arise from collusion are socially beneficial. ¹

Issues such as scale economies in rent-seeking or a bias toward one firm in the award of the rent can be examined by appropriately adjusting the expression that determines a firm's probability of winning. The existence of economies of scale makes collusive behavior more profitable while diseconomies of scale reduce the attractiveness of collusion. Introducing bias into the award of the rent by favoring one of the firms results in lower aggregate rent-seeking expenditures. ² Under these circumstances the total profitability of collusion (including external benefits to non-colluders) falls as the bias increases. Nevertheless, firms may still gain from collusive expenditure reductions.

Research and development races are similar to rent-seeking contests in that all participants make expenditures but only one firm wins the prize (a patent). This suggests that R&D consortia can be analyzed within the framework of this paper. The uncertain prospect that any firm will achieve success, however, makes the analogy between the rent-seeking game examined here and R&D contests less than exact. Furthermore, even within an R&D consortium, substantial expenditures may be needed in order to ultimately secure the prize.

Section 2 explores the basic model, and derives the results that (1) anticipated collusion is unprofitable except for coalitions that approach the size of the grand coalition, and (2) the profitability of collusion to the colluding coalition falls as the collusion becomes more suspected by the non-colluding firms. Section 3 introduces the possibility of economies or diseconomies of scale in rent-seeking games and shows that increased scale economies make collusion more attractive. Section 4 extends the analysis to 3-firm biased rent-seeking games that involve an "incumbency advantage" for one firm, and Section 5 presents conclusions.

2. The model

There are n identical risk neutral firms, 2 ≤ n < ∞, each of which can choose expenditures xᵢ, i = 1, . . . , n, to attempt to win a monetary prize of size π > 0. Firm i's probability pᵢ of winning the prize equals firm i's share of total rent-seeking expenditures:

\[ pᵢ = \frac{xᵢ}{\sum_{j=1}^{n} xⱼ} \]  

(1)

To exclude the uninteresting case where each firm bids 0, assume that the probability of firm i winning when all bids are zero equals zero.³ Firm i choose xᵢ to maximize expected profit \( Vᵢ = (pᵢ \cdot π) - xᵢ \). The number of firms n and equation (1) are common knowledge to the firms.