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A NOTE ON THE STABILITY OF LARGE CARTELS¹

BY ANDREW POSTLEWAITE AND JOHN ROBERTS

PROFESSOR JOHANSEN [2] has made a valuable point in raising the issue of the stability of competitive behavior and outcomes, even in large economies composed of many small agents, when these agents can collude in attempting to manipulate price formation. In [4], we argued that in most situations involving a large number of small agents² the ability of any individual to manipulate prices by altering his offers to buy and sell from their competitive values would go to zero as the number of agents increases. Correspondingly, the gain he could realize by such non-competitive behavior would vanish asymptotically. Thus, if there are any differential costs involved in such manipulation there would be no incentive in large economies for agents individually to depart from competitive behavior. Professor Johansen suggests that this argument does not apply if agents collude, and certainly one would expect that usually some group would find forming a cartel to its advantage.³ However, cartels would seem to present a serious threat to the competitive system in the long run only if they are themselves stable against individuals breaking from the cartel and readopting competitive behavior. The purpose of this note is to show how a minor adaptation of our analysis in [4] indicates that instability of this type is pervasive for the case of cartels composed of many small agents. We believe this serves to highlight the nature of the oligopoly problem.

The idea of the argument is simple.⁴ If a group of individually small agents is to remain large in the aggregate, it must grow at more or less the same rate as the rest of the economy. But as the numbers increase, whether a particular agent belongs to the cartel or breaks from it has an increasingly insignificant impact both on the overall make-up of the cartel and on the demand arising from the rest of the economy. Now suppose that the offers to buy and sell that the cartel chooses to make at any price depend continuously on the composition of the cartel and the structure of demand in the rest of the economy, and suppose that the correspondence between an economy's demand structure and its market-clearing prices is continuous. Then in large economies there will be little change in prices when a single agent breaks from the cartel and adopts price-taking behavior, with this change disappearing completely in the limit.⁵ Now, suppose that the agent has been actively contributing to the cartel's manipulation of prices by purchasing a bundle that was different from his competitive one at the prices prevailing in each economy, and suppose that these bundles converge to a bundle different from his

¹ Thanks are due to Leif Johansen, whose paper [2] stimulated us to further thinking on this subject, and to the National Science Foundation for its support of Roberts' research under grants SOC 74-04076 and SOC 76-20953.

² An individual's size here is in terms of the fraction that his endowment or purchases are of the aggregate.

³ For an interesting and important analysis in which cartels emerge endogenously, see [1].

⁴ This argument is given in detail in [3].

⁵ This limit economy involves a continuum of infinitesimal agents.

competitive choice in the limiting, infinite economy. Then in large enough economies, he would actually be strictly better off breaking from the cartel and acting competitively, even if the terms of trade are thereby turned against him somewhat.

This argument hinges on two continuity assumptions: that the cartel's choice of market behavior is jointly continuous as a function both of its composition and of the demand from the rest of the economy, and that market-clearing prices vary continuously as the excess demand relations change. The second of these, which we actually require to hold only at the limit (atomless) economy, is known to be true for an open, dense set of economies. Thus, although it may fail, and consequently a small agent might be able to influence prices markedly no matter how large the economy (see [4, pp. 121–123]), such cases should probably be considered as pathological and of no real consequence. The continuity of cartel behavior can be viewed as requiring the cartel not to react violently (a costly activity) to the departure of one small agent. This would seem to be a reasonable postulate in large economics. Thus, we should expect that cartels of large numbers of small agents will be inherently unstable and will not be a serious threat to competition.

This prediction is certainly borne out by the observations by students of industrial organization: cartels of large numbers of agents do tend to collapse in the absence of government steps to legitimize and enforce the cartel agreement through marketing boards, rate bureaus, licensing procedures, closed-shop rules, and the like. Thus, both theoretically and empirically, the threat to competition from such cartels is not significant.

Clearly, however, imperfectly competitive behavior does exist. But we would suggest that observed imperfect competition corresponds either to a legally binding cartel agreement or to a situation where a small group of agents is a significant part of one side or another of some market. In terms of the model, either of these situations can be viewed as one in which, even though there are a large number of agents, some agents are not small. Clearly, this case can present a real threat to competition; clearly, too, our analysis does not apply here.

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