The Aggregate Relation between Profits and Concentration Is Consistent with Cournot Behavior

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Abstract. An important and controversial stylized fact in industrial organization is the positive correlation between industry profit and concentration. One interpretation of this finding is based on the theories of Chamberlin and Stigler, which imply that concentrated industries facilitate collusion. But non-cooperative profit maximizing behavior can also generate a positive correlation. This paper presents an equilibrium model of oligopoly which nests the behavioral assumptions of Bertrand, Cournot, and Chamberlin. Simulations of the model under the Cournot assumption yield regression coefficients for the profits-concentration relation that are very close to the estimated coefficients in the literature.

Key words: Concentration, Cournot, oligopoly model, profits.

Despite decades of research, the cross-sectional variation in the rate of profit across industries remains poorly understood. Although most agree that a “handful of results have become conventional truths” in industrial organization, the field does not know what to make of them (Peltzman, 1991, p. 213). Instead, economists have generally abandoned inter-industry research to focus on what Bresnahan (1989) calls “important idiosyncracies” of individual industries. A healthy reason for this change in focus is the disorientation that follows from aiming a plethora of models at a small set of inter-industry facts.

We take the variety of models (many emphasizing the interaction between strategic elements and industry-specific conditions) as given and do not dispute the value of detailed analyses of individual industries. But it is our view that the critique of generalized models in industrial organization is overstated. There are important stylized facts that characterize industry performance (see Schmalensee, 1989, for a lengthy list), facts that have periodically motivated policy initiatives with serious consequences. Systematic modeling of inter-industry differences is certainly useful

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and perhaps necessary to gain a better understanding of these facts, irrespective of whether such models are capable of identifying structural parameters.\(^1\)

The contribution of this study is to show that the magnitude of a key finding in the literature – the inter-industry correlation between profits and concentration – is consistent with a slight modification of what many regard as the benchmark model of oligopoly, the Cournot model. This finding is important since it provides a simple explanation for a long-standing empirical fact that has generated numerous competing explanations and significant controversy. There has been a tendency in recent years to dismiss studies on the profits-concentration relation due to faulty methodology (Bresnahan, 1989) or flawed measurement of profits (Liebowitz, 1986; Fisher and McGowan, 1985). Yet the basic correlation appears in many forms. The original correlation using inter-industry rates of return was confirmed using price-cost margins beginning with Collins and Preston (1968), rates of return using firm-level data (Shepherd, 1972), and numerous studies of price within an industry (Weiss, 1989), where more detailed attention to costs is feasible. Furthermore, as Domowitz et al. (1986a) and Salinger (1990) have shown, a significant positive correlation between concentration and the price-cost margin appears in annual data in each and every year between 1958 and 1984. It is important to explain it. That a model as basic as Cournot predicts not just the sign, but the magnitude of this correlation is good news for economics in general and industrial organization in particular.

The correlation’s initial explanation, associated with its originator Joe Bain (1956) and the classic oligopoly models of Chamberlin (1933) and Stigler (1964), is that concentrated industries facilitate collusion, leading to supernormal profits.\(^2\) The primary competing interpretation holds that excess profit rates reflect efficiency advantages captured by large firms with large market shares, an idea first promoted by McGee (1971) and Demsetz (1973).

But there are many theories which imply a positive relation between profits and concentration. Indeed, with the exception of Bertrand, all of the major theories of oligopoly – Chamberlin, Cournot, Stackelberg, and Stigler – imply a positive relation between profits and concentration. It is obvious however, that the strength of the relation will differ depending on whether firm behavior is characterized as independent, as in Cournot, or collusive. To assess the empirical relevance of these

\[^1\] We suspect that there are few models in economics that can truly do so. There are many however that explain economic data in a coherent, systematic way. Our work in this paper should be interpreted in this light. For a glimpse of the critique of inter-industry models, see Bresnahan (1989) and Schmalensee (1989).

\[^2\] Scherer’s text (1980, p. 267) interprets Bain’s hypothesis in the following: “in view of the pricing behavior expected under monopoly or tight oligopoly, the average profit realized by firms in highly concentrated industries will tend to be significantly higher than that of firms in less concentrated oligopolies or atomistically structured industries” (emphasis added).