Available online at www.sciencedirect.com
ScienceDirect
International Journal of Industrial Organization
26 (2008) 266–287
International Journal of Industrial Organization
www.elsevier.com/locate/econbase

Entry for merger with flexible manufacturing: Implications for competition policy

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Received 16 February 2006; received in revised form 1 November 2006; accepted 6 December 2006
Available online 17 January 2007

Abstract

This paper studies a model of product variety with flexible manufacturers when, contrary to prior work, atomistic entry occurs prior to horizontal integration. In this model, more lax antitrust laws that allow for fewer and more concentrated merged firms lead to a greater extent of excess entry. Optimal policy permits no horizontal mergers when demand is perfectly inelastic, but may permit some horizontal integration when demand is price responsive.

JEL classification: D42; D43; L11; L12; L13; Entry

Keywords: Market structure; Horizontal merger; Flexible manufacturing

Flexible manufacturing systems that customize products for a wide range of consumer preferences are increasingly prevalent in a number of industries, including electronics, construction equipment, machine tools, construction materials, clothing, automobiles, furniture, computers, software, and aerospace (Norman and Thisse, 1999). In a small and growing literature, economists have studied implications of these systems for market structure, beginning with the initial work of MacLeod, Norman and Thisse (1988) and Lederer and Hurter (1986).[2] How do these systems affect equilibrium entry? And what are the attendant implications for economic welfare and antitrust policy?

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[1] I am indebted to Josh Gans and an anonymous reviewer for invaluable comments on a prior version of this paper. The usual disclaimer applies.

[2] For related work on flexible manufacturing systems, see Norman and Thisse (1996), Roller and Tombak (1990), Eaton and Schmitt (1994), Reitzes and Levy (1995), Anderson and Engers (2001). Other work studies flexibility in production quantities, rather than product attributes (e.g., Boyer and Moreau, 1997).

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doi:10.1016/j.ijindorg.2006.12.001

To address these questions, scholars study market settings characterized by either exogenous pure competition (the "interlaced stores" of Brander and Eaton, 1984; Norman and Thisse, 1999) or an incumbent firm (or firms) that has the first opportunity to proliferate products before any other firm can enter the market. The purpose of this paper is to study the entry and welfare effects of flexible manufacturing when there is a different ordering of who enters when. Specifically, we envision first a phase of differentiated product development wherein many firms work to identify local niches in product space; this entry phase is then followed by opportunities for horizontal mergers, subject to antitrust constraints. We thus assume that entry occurs *first*, before horizontal concentration takes place. Concentration occurs by horizontal merger, rather than by initial monopolization of the market.

There is reason to think that concentration by merger, as modeled here, is very relevant in certain markets. For example, food markets often fit the description for flexible production. Large numbers of differentiated food products are tailored to consumer tastes, with conventional U.S. supermarkets today selling between fifteen and twenty thousand items.[3] Moreover, in these markets, new product introductions are made both by dominant firms and proportionately more by a large number of much smaller firms. In 1993, the ten largest U.S. food companies accounted for less than 7% of all new food product introductions, but over 50% of total U.S. market share (among all publicly traded food companies).[4] The smaller food companies that are responsible for the vast majority of new product introductions may ultimately anticipate future mergers with other producers.[5] These firms are precisely the sorts of a priori entrants that we model in this paper.

Another relevant example is the paint and coatings industry.[6] This industry offers a large array of different products, often tailored to specific customer needs using flexible production technologies.[7] New products are constantly being introduced by new and incumbent firms,[8] and mergers are constantly absorbing smaller firms into bigger ones.[9] Hence, as in food markets, entrants can anticipate future mergers with other producers.

The ordering of entry has quite sharp implications for antitrust policy. In a model of flexible manufacturing wherein an incumbent monopolist can saturate the product space before any

[3] See www.fmi.org and Progressive Grocer (60th Annual Report of the Grocery Industry, 72:104, April 1993).

[4] These statistics are derived from COMPUSTAT sales data for companies in the food industry's two digit SIC class 20 (food and kindred products) for 1988–1995 and data on new product introductions reported in Prepared Foods (162:24, November 1993).

[5] Between 1997 and 2002, for instance, there was an annual average of 646 mergers in the food industry and 294 mergers in food processing, production and wholesaling businesses alone (The Food Institute Report, January 20, 2003). Prominent recent examples of food company mergers include acquisitions of Snapple by Cadbury (a leading soft drink producer) in 2000, Celestial Seasonings by the Hain Group (a leading natural foods producer) in 2000, and Earth's Best baby foods by Heinz (a leading baby food producer) in 1996.

[6] I am indebted to the Editor, Josh Gans, for suggesting this example.

[7] An industry organization (see www.paint.org) writes: "Many of the industrial and special purpose coatings are formulated in close consultation with the end-user, to achieve optimum product characteristics that conform to the applier's specifications, as well as to the available means of application." The range of products and the range of product applications are vast in this industry. For example, paints and coatings include enamels, primers, undercoats, stains, varnishes, clears, powders, UV cures, and aerosols, among others. Applications range from homes and buildings to aircrafts, automobiles, and ships to machinery and appliances to bridges and factories.

[8] For example, in one month (September 2006), a paint and coatings industry magazine (www.pcimag.com) identifies the introduction of five new materials (including a new colorant system, a new specialty coating, a new waterborne UV resin, and a new urethane dispersant), as well as new scratch-resistant coatings (using alumina and silica nanoparticle additives), reformulated paints that are less toxic to the environment, new acrylic and waterborne UV interior coatings, longer-lived ceramic coatings, and new advances in color technology (that more efficiently match colors, determine formulae, and design color schemes).

[9] For example, in one month, the industry magazine (www.pcimag.com) identifies fifteen key new industry mergers.