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Vertical integration and collusive incentives: an experimental analysis

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Abstract

We consider vertically related industries with multiple downstream markets; firms make simultaneous output choices in a repeated game. Upstream duopolists merge with producers in one of the downstream markets that also is a duopoly. Experimental duopoly markets are constructed to assess the effects of vertical integration upon outputs and profits. We find that integration raises outputs in both downstream and upstream markets, although only the upstream effect is statistically significant. Integrated profits are lower and consumer welfare is higher. The integrated markets tend to equilibrate more quickly. © 2000 Elsevier Science B.V. All rights reserved.

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JEL classification: L1; L22

1. Introduction

Consider an intermediate good that is sold as an input in multiple downstream markets. The production of this good is dominated by a few sellers that simultaneously choose outputs. One of the downstream markets is oligopolized, and upstream firms integrate into this downstream market. This market structure may describe, for example, large gasoline refiners merging with airline companies,

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movie studios acquiring theaters in major metropolitan areas, or manufacturers of a product integrating downward and becoming the major retailers in a certain geographic market. There exist a variety of reasons for outputs and prices to change in these markets as a consequence of such integration. We describe some of them.

Before merging, it is well known that this vertical relation suffers from the 'double marginalization' problem.[1] Downstream firms set a price above their marginal cost, which depends on the upstream price of the intermediate good. Profit maximizing upstream firms have already set a price for the input above their marginal cost; thus the input price is marked-up twice. By eliminating the dual markups, vertical integration should raise outputs and lower prices in both markets.

In addition, integration can eliminate uncertainty in the vertical relation. If the upstream market is in a state of disequilibrium, or maintains only temporary equilibria, and downstream producers are risk averse, they would be inclined to produce less and correspondingly demand less of the input in a vertically separated structure (Carlton, 1979; Perry, 1982). The often cited reason for airlines merging with petroleum refiners is that airlines wanted more stable deliveries and prices of jet fuel (*Businessweek*, November 17, 1980). In the 1948 Paramount Pictures case (334 U.S. 131 (1948)), movie studios claimed they were merging with theaters in order to guarantee outlets for their films. Since the integrated firm has information unavailable to the nonintegrated firms, a more precise prediction of upstream and downstream prices and outputs can be formed after a merger. Integration is therefore capable of mitigating production uncertainties; outputs also should increase for this reason.[2]

On the other hand, a fully integrated market structure might facilitate greater levels of cooperation than a nonintegrated market structure, which might lower outputs. There is the persistent notion that if firms interact repeatedly over an indefinite number of periods, more collusive outcomes that raise prices and restrict outputs at both levels of production are possible as a result of the mergers (see

[1] For a discussion of double-marginalization in the context of vertically related oligopolies, see Greenhut and Ohta (1979); Hay and Morris (1991); Perry (1989), or Tirole (1988). Since an increase in upstream output lowers downstream marginal cost, it raises marginal profit for the downstream firms. While upstream firms neglect this effect in a nonintegrated market structure, it is taken into consideration by vertically integrated firms. Thus, a unilateral merger raises the integrating firms' combined profits (relative to the level without integration). However, as we note below, if more than one pair of firms becomes vertically integrated, industry profits may fall.

[2] There can be more to this simple story. Crocker (1983) and Gal-Or (1992) show that vertical integration may take place to eliminate 'opportunistic' behavior by the downstream firm when it holds private information about its costs. The downstream firm may have an incentive to strategically distort reports of its true costs in order to boost profits on final sales. When firms are vertically separated this manipulation may go undetected by the upstream firm.

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