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On the competitive effects of vertical integration by a research laboratory

Joel Sandonís *, Ramon Faulí-Oller

Universitat d'Alacant, Department de Fonaments de l'Anàlisi Econòmica, Campus de Sant Vicent, 03071 Alacant, Spain

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Abstract

An independent research laboratory owns a patented process innovation ready to be used by an industry that produces differentiated goods. We analyze whether the laboratory prefers to license the innovation as an external patentee or to merge with one of the firms in the industry, licensing the innovation as an internal patentee. Under linear demand and Cournot competition, we show first, that the vertical merger is profitable only in the case of small innovations, whereas a merger increases welfare only for significant innovations; second, all profitable vertical mergers reduce welfare. However, some profitable mergers are welfare improving under price competition.

JEL classification: D43; D45; L41

Keywords: Patent licensing; Two-part tariff contracts; Vertical mergers

1. Introduction

The patent licensing literature has focused on the analysis of optimal licensing contracts with the laboratory being either an external or an internal patentee.[1] In this paper, we endogenize market structure by analyzing whether the laboratory prefers to license the innovation as an external patentee or to merge with one of the firms in the industry, licensing the innovation as an internal patentee. For example, in 1999 Celltech Chiroscience, a science-driven biotechnology

* Corresponding author.
E-mail addresses: sandonis@merlin.fae.ua.es (J. Sandonís), fauli@merlin.fae.ua.es (R. Faulí-Oller).

[1] See Kamien and Tauman (1984, 1986), Katz and Shapiro (1986), Kamien et al. (1992), Kamien (1992), Saracho (2002), Wang (1998), Wang and Yang (1999) and Kamien and Tauman (2002).

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firm merged with Medeva, a pharmaceutical firm, creating Celltech Group, UK's fourth largest pharmaceutical firm. Peter Fellner, Celltech's chief executive argued that the merger was aimed principally at retaining a greater share of profits by pushing products through its own sales force rather than licensing them out.[2]

We analyze a linear demand model with differentiated goods and two Cournot duopolists. The main results of the paper depend on the balance of two opposite forces. First, as an internal patentee the laboratory can better internalize market profits, whereas an external patentee also has to care about reducing the licensees' profits in case they refuse the contracts, namely, their external options. Second, whereas an external patentee may use two instruments (one contract for each potential licensee) to affect the market outcome, an internal patentee loses the commitment ability to restrict its own output as it can only use one instrument (the contract offered to the remaining independent firm).

We show that which effect dominates depends on the size of the innovation. For large innovations, the profits that any firm can obtain by refusing the contract offered by the external patentee are low, which allows the patentee to care mainly about market profits, as an internal patentee. As it can achieve this by means of one more instrument, being an external patentee must be more profitable. For small innovations, the external option of firms is large and thus, becoming an internal patentee turns out to be preferred, since the possibility to maximize market profits outweighs the loss of one instrument.

Regarding the effect of a vertical merger on social welfare, there are two opposite effects. The good news for welfare is that the merged firm loses the commitment ability to restrict its output since it cannot credibly increase its own marginal cost.[3] The bad news for welfare is that the merged firm has an incentive to reduce market competition by charging a higher royalty to the rival firm. The balance of these two forces leads to the result that for significant innovations the vertical merger increases welfare.

If we take into account that the antitrust authorities can either approve or reject exclusively mergers that are proposed by the merging partners (i.e., profitable mergers), in order to derive the optimal competition policy we must combine both the results on welfare and profitability. We realize then that profitable mergers are never welfare improving. Thus, a very simple prescription arises: the antitrust authority should forbid all (profitable) mergers.[4] This result is very sensitive to the type of competition. For example, with Bertrand competition, we find cases where profitable mergers increase welfare.

This model can be applied to a more general context of an upstream firm supplying an input to a downstream duopoly that can be by-passed by using a less efficient alternative input. Within this interpretation, the paper can be seen as a contribution to the old debate on the competitive effects of vertical integration. There are two opposite theories: on the one hand, the Chicago School (e.g., Bork, 1978; Posner, 1976) defended that, in the absence of efficiency gains, vertical integration could not increase the profitability of merging firms. Their argument was that a bottleneck monopolist could earn monopoly profit on the corresponding segment, but could not extend its market power to related segments (Rey and Tirole, 2005). On the other hand, the so-called new market foreclosure theory stresses the role played by vertical integration in restricting downstream competition.

[2] Financial Times, November 12, 1999.

[3] This commitment loss is also considered in Bonano and Vickers (1988).

[4] Of course, a merger among the laboratory and the two firms would be another possibility. The analysis of this case would be trivial, as that merger would be profitable and welfare reducing, so the antitrust authority should forbid it.