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Strategic investments with spillovers, vertical integration and foreclosure in the broadband access market

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Abstract

We analyse competition between two retailers of broadband access when they differ in their ability to offer value-added services. One retailer is vertically integrated and controls the input-market for local access. This firm invests to increase the input quality (upgrading to broadband) before an access price regulation is set. We first show that access price regulation may lower consumer surplus and welfare if retailers do not differ too much. Second, if the integrated firm's ability to offer value-added services is much higher than that of the rival, the integrated firm uses overinvestment as an alternative foreclosure tool.
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1. Introduction

The purpose of this paper is to examine the interplay between a facility-based vertically integrated firm and an independent competitor in the retail market for broadband Internet connectivity. The latter firm buys local access as an input from the former firm. The vertically integrated firm undertakes an investment (broadband upgrades) that increases

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the quality of the input. We assume that the regulator has only one instrument available, an access price regulation for the input sold to the independent rival.[1] The retail market is assumed to be unregulated.[2] Furthermore, we assume that the access price is set after the investment but prior to retail market competition since the regulator has limited commitment ability. Both the timing structure and the one-sided regulation of the input segment correspond to the dominant regulatory paradigm in the EU and the USA (Laffont and Tirole, 2000; Hausman, 1997; Cave and Prosperetti, 2001). Installation of fiber in the local access network will be a substantial, lumpy, and irreversible investment, and the economic life of the investment will be longer than the regulation contract used for access prices (Hausman, 1997).[3]

The access price regulation may reduce investment incentives, and the main message of this paper is that the total welfare effect of access price regulation critically depends on which firm has the highest ability to transform input to output. The quality of the input component sold from the integrated firm is the same for both retailers, but the retailers may differ in their ability to offer value-added services (broadband services such as interactive video).[4] Except for the case where the independent firm has the highest ability to use the improved input quality, the integrated firm will foreclose the rival from the market through the access price in an unregulated environment. However, this is not a sufficient condition to ensure that an access price regulation improves consumer surplus and total welfare. If the retailers do not differ too much with respect to their ability to offer value-added services when the input quality is improved, we show that access price regulation reduces the vertically integrated firm's investment incentives. An access price regulation lowers consumer surplus and total welfare as long as the cost of investment is not too convex. If the vertically integrated firm's ability to offer value-added services is much higher than that of the independent rival, an increase in the investment will reduce the quantity offered by the independent retailer. An access price regulation still eliminates the vertically integrated firm's ability to use the access price as a foreclosure tool, but now the integrated firm may use overinvestment as an alternative tool to drive the rival out of the market.

Today the majority of residential consumers use their telephone lines for the last mile of narrowband Internet connectivity, and by upgrading their local networks the telecommu-

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[1] See Laffont and Tirole (2000) and Armstrong (2002) for comprehensive overviews of access price theory and practice. Cave and Mason (2001) give an extensive overview of the market structure and regulation in the Internet.

[2] See Laffont and Tirole (2000) for a discussion.

[3] Price cap regulations in telecommunication do not exceed 5 years, and other types of access price regulation are usually set for a shorter period. In contrast to the present paper, the literature on price caps typically focuses on incentives for cost-reducing activities within the regulatory contract.

[4] The independent firm may be anything from the geeks in the garage to AOL Time Warner. Compared to the facility-based vertically integrated firm, those firms' ability to offer value-added services will obviously vary a lot. The integrated firm's retailer may have an advantage in using the improved input quality due to economies of scope from integration. In contrast, if the independent retailer is a firm like AOL Time Warner, it may have an advantage compared to the integrated firm due to its experience from other markets.

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