Public and Private Infrastructure Investment in Mixed Duopoly

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Abstract

The restructuring of network industries has raised concerns about underinvestment in network infrastructure. While previous work has established that the incentives of private firms to make infrastructure investments subtly depend on the restructuring approach, there has been little interest in the role of public investment. Yet, in many network industries, public network operators compete with private firms, and public infrastructure investment continues to play a major role. A case in point is the market for broadband communications services provided over fiber optics networks, where public network operators compete with private firms. In mixed markets, it seems natural to ask whether public investment crowds out private investment. More generally, we are interested in understanding how the presence of a public firm affects equilibrium investments, pricing and welfare.

In this paper, we study the investment and pricing decisions of private and public firms in a mixed duopoly model. We consider a two-stage game where firms simultaneously make demand-enhancing investments in stage 1 and compete in prices in stage 2. Firms produce horizontally differentiated products, and the public firm may be more or less efficient than the private firm. We compare the equilibrium outcome of the mixed duopoly with the outcome in a duopoly with private firms and the welfare optimum. We analyze a reduced-form model and illustrate our analysis with a standard linear demand function.

We derive the following key results (work in progress): First, the public firm adheres to an adapted marginal-cost pricing rule, where the price is corrected downwards because of the strategic interaction with the private firm. Second, under specific assumptions on demand, infrastructure investments are strategic substitutes, such that public investment crowds out private investment. Third, aggregate infrastructure investments is highest in the welfare optimum, medium in the mixed duopoly, and lowest in the duopoly with private firms.