Telecommunications Policy ∎ (∎∎∎∎) ∎∎∎–∎∎∎

Contents lists available at ScienceDirect

Telecommunications Policy

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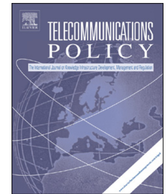

Exclusion and regulatory intervention in investment sharing agreements

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ARTICLE INFO

Article history:
Received 22 December 2015
Received in revised form
9 June 2016
Accepted 4 July 2016

Keywords:
Basic investment sharing agreements
Exclusion
Access price regulation

ABSTRACT

An incumbent and an other licensed operator may jointly invest to develop fiber network infrastructure while an outsider operator invests to develop cable network infrastructure. Regardless whether the investment sharing agreement occurs, market exclusion of the facility-based outsider does not hold. Considering the prevalence of the investment sharing agreement, it is not necessarily true that each insider contributes with an investment share of 50% since there may exist a trade-off between bargaining power and investment participation. Although full integration avoids duplication of investment costs, social welfare may be higher under partial integration. Presuming the increasing run for fiber, the framework proposes the inclusion of a fourth service-based operator that requires access to the fiber network infrastructure held by the consortium. This may define a tight oligopoly with simultaneous presence of investment sharing agreement. The service-based outsider is excluded from the retail market when the wholesale access price is unregulated. Subsequently, market exclusion depends on the competitive nature of the outsider firm. Finally, the framework reveals the conditions that legitimize ex-post regulation of the wholesale access price of fiber. An asymmetric regulatory intervention at the wholesale access price level is justified as a means of improving social welfare if the investment effort is excessively high. The same applies if the investment effort is intermediate, provided that an excessively high gap exists between the vertical spillover that affects the fiber consortium in relation to the vertical spillover that affects the cable operator.

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1. Introduction

The development of Next Generation Networks (NGNs), in particular, fiber is costly. In addition to avoid duplication of investment costs, other benefits resulting from investment sharing agreements include higher speed, dissemination and coverage of the innovative technology, reduction of entry barriers and mitigation of investment risk, something particularly relevant in sectors subject to continuous innovation and high degree of uncertainty. Semicollusion seems to be the main negative aspect resulting from these contracts given that insiders explicitly collude in investment, however, compete in other variables, for instance, price or quantity (Steen & Sørgard, 2010). Two main concerns emerge from regulatory standpoint. On the one hand, National Regulatory Authorities (NRAs) should understand whether investment sharing agreements imply outsiders' exclusion. On the other hand, the relation between individual interests and investment

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http://dx.doi.org/10.1016/j.telpol.2016.07.002
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coordination of insiders requires detailed explanation.

The goal of the paper is twofold. Firstly, economic literature exposes that investment sharing agreements imply the exclusion of the service-based outsider when the wholesale access price is unregulated (Cambini & Silvestri, 2013). However, in the present framework, the outsider is facility-based competitive. One should understand whether the conclusion of Cambini and Silvestri (2013) remains valid. Moreover, the analysis clarifies the trade-off between bargaining power and investment participation of insiders. While Cambini and Silvestri (2013) restrict the focus on partial integration, this study also compares partial integration with full integration through co-investment. Secondly, the robustness of the first result is investigated by extending the analysis to four market operators where the fourth firm is a service-based competitor. The purpose is to understand whether exclusion of this outsider occurs and under which circumstance ex-post access price regulation is legitimized as a means of improving social welfare. This extension is motivated by two reasons. On the one hand, this market structure may represent a tight oligopoly with simultaneous presence of co-investment agreement. The topic is currently under intensive analysis in Europe (BEREC, 2015). On the other hand, this market structure is representative of the Portuguese telecommunications industry.[1]

The main results are described as follows. On the first question, exclusion of the facility-based outsider does not hold. This finding does not contrast with Cambini and Silvestri (2013) but rather complements their conclusion. In fact, once incorporating the fourth firm, this service-based operator is excluded from the retail market when the wholesale access price is unregulated. Hence, market exclusion depends on the competitive nature of outsiders. The endogeneization of insiders' investment participation reveals the establishment of an inverse relation between bargaining power and investment share supported. Other theoretical and practical arguments also suggest that an egalitarian consortium may not always prevail. Although full integration avoids duplication of investment costs, the comparison between partial and full integration shows that the former may be the socially desirable regime. This conclusion is justified by the reduction of industry output and consumer surplus in addition to the ambiguous effect on producer surplus once changing from partial integration to full integration. On the second question, the wholesale access price of fiber may be subject to ex-post regulatory intervention if the investment effort is too high. In turn, if the investment effort is intermediate, ex-post regulatory intervention is also socially desirable as long as the vertical spillover that affects the fiber consortium excessively outweighs the vertical spillover that affects the cable operator.

The paper contributes for the strand of economic literature that analyzes the interplay between investment incentives, social welfare maximization and access price regulation in the context of NGN. Bourreau, Cambini, and Hoernig (2012) provide useful theoretical background. Inderst and Peitz (2012) analyze the timing of co-investment contracts and the role of access price regulation on innovation and competition. Ex-ante contracts lead to broad roll-out and less frequent duplication of investment costs in relation to ex-post contracts. Bourreau, Cambini, and Hoernig (2015) conclude that cooperative agreements increase total coverage if product differentiation and cost economies are both high. Mandated access reduces co-investment incentives while voluntary access raises coverage but reduces social welfare if product homogeneity is sufficiently high. Notwithstanding, the focus on the competitive nature of outsiders as well as the formal treatment of the endogenous relation between private interests and investment participation of insiders are under-exploited topics by previous contributions. There is also the common wisdom that co-investment agreements promote higher level of social welfare (Cambini & Silvestri, 2013). However, economic literature has not yet been capable of providing clearness about the market conditions, whereby adopting partial or full integration leads to an improvement of social welfare. The interested reader may observe, in Appendix B.2, a discussion on this matter in light of the contradictory regulatory measures on investment sharing taken during 2016 by the Comisión Nacional de los Mercados y la Competencia (CNMC) in Spain and by the Autorité de Régulation des Communications Electroniques et des Postes (ARCEP) in France.

The paper proceeds as follows. Section 2 presents the model with three market operators and provides the analysis and comparison of three distinct regimes, namely, facility-based competition, partial integration and full integration. Section 3 studies the model with four market operators, where the fourth firm is a service-based outsider. The concern relies on understanding whether ex-post access price regulation in favor of fiber should occur. Section 4 concludes. The remaining analysis is relegated to the Online Appendix.[2]

2. Model with three market operators

2.1. Basic environment

Three firms provide broadband connectivity in the retail market. Incumbent M and facility-based firm V are vertically integrated firms. Both have an investment option to upgrade the quality of the respective fiber network infrastructure which allows for the convergence of better and more value-added services for voice, data and streaming. Facility-based firm N

[1] See Appendix C.1 and Appendix C.2 for a detailed clarification.

[2] Formal proofs are exposed in Appendix A. Appendix B analyzes the environment without technological superiority of fiber in relation to cable, provides the formal treatment of Nash bargaining between insiders and discusses the absence of full integration emphasizing reasons emerging from the Portuguese telecommunications industry. Appendix C clarifies economic, technical and institutional aspects not exposed in the main text. Appendix D shows the economic intuition of the main findings.

Please cite this article as: Ribeiro, V. M. Exclusion and regulatory intervention in investment sharing agreements. *Telecommunications Policy* (2016), http://dx.doi.org/10.1016/j.telpol.2016.07.002

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