Telecommunications Policy 36 (2012) 595–607

Contents lists available at SciVerse ScienceDirect

Telecommunications Policy

URL: www.elsevier.com/locate/telpol

Roaming and investments in the mobile internet market

Torben Stühmeier*

Heinrich-Heine-Universität Düsseldorf, Düsseldorf Institute for Competition Economics (DICE), Universitätsstr. 1, 40225 Düsseldorf, Germany

ARTICLE INFO

Available online 18 April 2012

Keywords:
Mobile internet
Investment spillover
National roaming
Regulation

ABSTRACT

This model discusses mobile network operators' (MNOs) incentives to invest in their network facilities such as new 4G networks under various regimes of data roaming charge regulation. Given an induced externality of investments (spillovers) due to the roaming agreements it will be shown that MNOs, competing on investments, widely set higher investments for below cost regulation of roaming charges. Otherwise, if MNOs are free to collaborate on investments, they set higher investment levels for above cost roaming charges. Both below and above cost charges may be preferred from a welfare perspective. Furthermore, the paper discusses effects of the roaming charge regulation on roaming quality and MNOs' coverage.

© 2012 Elsevier Ltd. All rights reserved.

1. Introduction

The telecommunications industry faces the transition from third generation (3G) to 4G networks such as long-term-evolution (LTE) networks. 'The boom in data traffic has caused mobile operators a lot of problems, because they need to invest in their existing 3G infrastructure and soon in new technologies like LTE and Wimax while maintaining parallel technologies like GSM (and in some cases CDMA),' says Uwe Steffen, the head of Nokia Siemens network's radio access solutions. The demand for mobile data traffic is persistently increasing throughout recent years. Global mobile data traffic grew 2.3-fold in 2011, mobile data traffic was more than three times greater than total Internet traffic in 2000.[1] Multimedia content through 3G services requires significantly larger capacities than voice or text messages through 2G, though. An email is normally between 1 and 50 kB, a page of an online newspaper can be 100 kB or more. The download of a song requires 2–5 MBs of data.

Hence, the transition from 2G to 3G and the rollout of LTE and Wimax networks, also referred as 4G, causes mobile network operators (MNOs) to consider new infrastructure models. Network operators begin to collaborate on infrastructure building or rely on infrastructure or network sharing. Collaborations on infrastructure tend to play a key role in the rollout of 4G. In Spain and Sweden networks already collaborate in building capacities for the new standards. In Germany, the incumbent operator Deutsche Telekom recently stated it would be open for collaborations in building up the fast LTE-Networks.[2] Under certain restrictions also Bundesnetzagentur (2010) (the national regulatory authority) would embrace such collaborations among competitors.

Network sharing as an infrastructure model can be implemented at different levels of a mobile network. It may take a form of passive sharing of masts and antennas or sharing active elements of radio active access networks (RNAs) or roaming in the core of the network.[3] The present paper focuses on cross sharing of infrastructure in terms of national data

* Tel.: +49 211 81 15497; fax: +49 211 81 15499.
E-mail address: torben.stuehmeier@dice.hhu.de

[1] Retrieved from http://www.cisco.com/en/US/solutions/collateral/ns341/ns525/ns537/ns705/ns827/white_paper_c11-520862.pdf.
[2] Retrieved from http://www.spiegel.de/wirtschaft/unternehmen/0,1518,723862,00.html.
[3] For an overview of alternative forms of network sharing and technical details see http://www.gsm.org/documents/gsma.pdf.

0308-5961/$ - see front matter © 2012 Elsevier Ltd. All rights reserved.
http://dx.doi.org/10.1016/j.telpol.2012.03.006

roaming. National roaming is considered as a form of network sharing where MNOs in the same country code, which are usually direct competitors, use each others' networks. The agreement permits subscribers to roam onto a host network if the home network is not available in a particular location or in a time of congestion. This kind of agreement has especially been employed at the early stage of the 3G rollout and in peripheral areas. In the early 2000s operators in Europe (T-Mobile/O2 in the UK and in Germany or Tele2/Telia in Sweden) or Telstra/3 Australia in Australia entered into national roaming agreements to rollout 3G networks quickly to provide services in rural areas with low subscriber density and to provide additional capacity in congested urban areas or in times of congestion. Likewise the 3G rollout national roaming agreements will likely become important in the 4G rollout.

Any agreement on collaboration and sharing of infrastructure is naturally of regulatory and competition authorities' interest. Collaborations are typically subject to Article 101 of the EU Treaty which defines criteria under which such agreements could be considered as anticompetitive, however, also allows for potential efficiency gains which are weighted against competitive harm. Referring to national roaming, two competition cases underpin the European Commission's current view on the potential impact of roaming on competition. In 2006 the European Commission found that the agreement between T-Mobile and O2 in Germany would restrict competition at the wholesale level with potential harmful effects in the downstream markets. According to the European Commission roaming would undermine infrastructure-based competition, since it would significantly limit competition on quality and transmission speed. Moreover, it would reduce scope for price competition at the retail level. The European Court of First Instance finally annulled the decision holding that the European Commission had not presented sufficient evidence of harmful effects on competition. However, it generally agreed that national roaming agreement may limit competition between operators, in particular when roaming occurs in urban areas or markets which can take more than one or two operators. The link between roaming agreements and their induced effects on competition on infrastructure building and competition on retail prices serves as the starting point of the present paper. It takes a roaming agreement between two MNOs, competing on the retail level and possibly competing or collaborating on investments, as given and analyzes its impact on providers' incentives to invest in infrastructure.

Hitherto regulators tend to rely on operators to engage in negotiations to set a wholesale roaming price on each others' networks. Due to cross sharing of infrastructure the roaming charge for data services shows some similarities to widely analyzed two-way externalities in voice telecommunications. The effect of wholesale prices on competition and its regulation is extensively debated in the literature of voice telephony but is rarely addressed with data services, yet. The recent academic literature on voice telecommunications discusses the regulatory concerns under two-way network competition, where networks may use the termination charge as an instrument of tacit collusion because of a raise-each-other's-cost effect (see Armstrong, 1998; Laffont, Rey, & Tirole, 1998). Fabrizi and Wertlen (2008) stress, though, that interconnection agreements within the mobile Internet services do not have entirely the same nature as interconnection agreements between voice communications operators. With voice telephony interconnection refers to enabling end-to-end users telecommunications traffic, which thus involves the origination of a given traffic within a network, its transportation, and its termination either in the same or the rival network. Data roaming instead refers to the access of the unilateral service by the rival network, origination and termination. The present model shows that although operators negotiate roaming charges above costs this does not necessarily harm retail competition, since the effects of roaming charges on investments in network quality have additionally to be considered. Investment incentives may be encouraged both by high and low roaming charges. Moreover, both roaming charges above and below costs might lead to under- and overinvestments from a welfare perspective.

Recent research on roaming in the mobile Internet market is conducted by Fabrizi and Wertlen (2008). Their focus is on optimal market coverage given roaming agreements among networks. In their model MNOs are free to enter sharing agreements. They show that MNOs avoid network duplication in order to maximize rents from roaming. Valletti (2003) considers national roaming for mobile telephony and shows that only colluding operators have an incentive to engage in roaming agreements. The present model is in line with Valletti and Cambini (2005), who analyze voice communications providers' incentives to invest given different regulation regimes. In their two-way access model, networks tend to underinvest in quality, which is exacerbated if they can negotiate reciprocal termination charges above costs. The present model is on one-way access and builds up on a model of Foros, Hansen, and Sand (2002), who analyze demand-spillovers due to voice roaming and joint investments in the mobile voice communications market. They abstract from any wholesale pricing and regulation of roaming charges and show that under collusion on investments, firms' and a welfare maximizing regulator's interest coincide, whereas with non-cooperative investments, firms even overinvest. The present model extends the model of Foros et al. (2002) by analyzing data traffic and wholesale regulation of roaming charges.

The paper is organized as follows: Section 2 describes the basic model. Section 3 solves the equilibrium in the retail market, whereas Section 4 analyzes incentives to invest given different roaming charge regulation regimes. Section 5 provides a social welfare analysis. Section 6 provides two extensions of the basic model, where MNOs choose the roaming quality and decide on their geographical coverage. Section 7 concludes.

2. The basic model

The model analyzes MNOs' incentives to invest in their network quality, where networks may collaborate on infrastructure investments, given different regulation regimes of roaming charge regulation. The following

دریافت فوری ← متن کامل مقاله

ISIArticles
مرجع مقالات تخصصی ایران

✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
✓ امکان دانلود نسخه ترجمه شده مقالات
✓ پذیرش سفارش ترجمه تخصصی
✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
✓ دانلود فوری مقاله پس از پرداخت آنلاین
✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات