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Consumer behavior towards on-net/off-net price differentiation

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ABSTRACT

This paper explores how consumers react towards price differentiation between on-net and off-net calls in mobile telecommunications – a pricing policy that is common in many mobile telecommunications markets. Based on a survey of 1044 students it is demonstrated that some consumers may suffer from a "price differentiation bias", i.e., a fair number of consumers may overestimate the savings that result from reduced on-net and/or off-net charges, as they do not appear to weigh the prices with the probabilities of placing off-net and on-net calls. This may help to explain why it have been the smaller operators in various countries who have introduced on-net/off-net price differentiation. The paper also discusses the implications that such a consumer bias may have for market competition.

1. Introduction

In July 2007, KPN lodged a complaint with the European Commission that T-Mobile and Vodafone would have a position of collective dominance in the German mobile telecommunications market (KPN, 2007). According to the reasoning of KPN, the main source of that allegedly dominant position was the price differentiation between on-net and off-net calls, which leads to tariff-mediated network effects. As T-Mobile and Vodafone entered the market two years prior to E-Plus (KPN's mobile subsidiary in Germany) and six years prior to O2 (the fourth and still the smallest mobile network operator in Germany), the two early movers were able to build a customer base which, in combination with differentiation between on-net and off-net prices, enabled the two larger firms to act largely independent from their smaller rivals, so the argument. While the Federal Cartel Office in Germany has discontinued its investigations by the end of 2009 (Bundeskartellamt, 2010), similar complaints against price differentiation between on-net and off-net calls have been made in other countries such as Austria and Italy (ERG, 2008, p. 43), Turkey (Atiyas & Dogan, 2007) or New Zealand (Commerce Commission, 2010).

The argument that the combination of a large initial market share and tariff-mediated network effects can be strategically used to foreclose the market and to secure market power sounds initially rather reasonable and has also been explored in the academic literature (Cabral, forthcoming; Harbord & Pagnozzi, 2010; Hoernig, 2007, 2008; Lopez & Rey, 2009). In addition, there has also been some empirical support for this hypothesis by Kim and Kwon (2003). Based on a consumer survey for the Korean mobile telecommunications market, their conditional logit analysis reveals that consumers prefer carriers with a larger number of subscribers other things being equal. As Kim and Kwon (2003) argue that intra-network call discounts are, among other factors, one likely source of that effect.

While the anticompetitive use of on-net/off-net retail price discrimination is certainly an issue if practiced by an incumbent in response to market entry (as recently happened in New Zealand), an interesting observation in this context is, however, the fact that in a number of European mobile telecommunications markets they have been the small entrants who started to price differentiate between on-net and off-net calls. In Germany, it was in fact E-Plus (the complainant's own subsidiary) who started

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to price differentiate between on-net and off-net calls when it entered the market in 1994 (Frontier Economics, 2004). Similarly, it has been reported by Frontier Economics (2004) that in the UK, on-net/off-net differentials were first introduced in late 1993 by One2One and in early 1994 by Orange when the two new networks launched their services, while the two incumbents only introduced such differentials in their charges in October 1998 (Vodafone) and in spring 1999 (BT Cellnet). In Ireland, Digifone entered the market in May 1997 with on-net/off-net differentials while incumbent operator Eircell only responded with similar differentials in May 1999 (Frontier Economics, 2004). Finally, in Austria it was tele.ring who first introduced on-net price discounts on its market entry in 2001 (Dewenter, Haucap, & Kruse, 2004). In other countries, however, the combination of on-net discounts and high off-net prices has apparently been used by incumbents to stifle competition. The most dramatic example may have been the case of the third mobile network operator in Slovenia, Vega, which exited from the Slovenian mobile market in 2006 after five years of operations, reportedly at least partly due to the aggressive on-net/off-net price differences offered by the two incumbents (Trilogy International Partners, 2009). Similarly, the third mobile operator that entered the New Zealand mobile market in 2009 (called 2degrees) has lodged complaints against anticompetitive on-net/off-net differentials by the two incumbent operators (Commerce Commission, 2010). However, even though in some instances (such as recently in New Zealand) incumbents appear to have clearly used on-net discounts to foreclose the market against competitive entry, the above observation that, at least in a fair number of countries, entrants have initiated on-net discounts appears to be at odds with the idea that on-net price discounts are only used as a tool to foreclose the market by large incumbent operators.

One potential explanation may be based on the so-called "calling club" argument, formulated among others by Gabrielsen and Vagstad (2008). According to this line of reasoning, consumers are grouped into social networks or "calling clubs", the members of which call each other more often than people outside the network. Therefore, customers are less interested in the absolute size of a mobile network than in the number of friends and family members associated with a given mobile operator. In fact, many European operators offer tariff options with discounts for calls to "family and friends". Moreover, based on UK survey data, Birke and Swann (2006) find that the proportion of off-net calls falls as mobile operators charge a premium for off-net calls, but even in the absence of any price differential between on-net and off-net, there is still a form of pure network effect, where a disproportionate number of calls are on-net. In addition, they find that the choice of operator is heavily influenced by the choices of others in the same household. The utility that an individual consumer derives from using mobile telecommunications heavily depends on which of her potential calling partners has already subscribed and to which network. More precisely, Birke and Swann (2006) estimated that roughly 9.2 million subscribers to a network have the same impact as one additional member from the same household being on the same network. Similarly, Corrocher and Zirulia (2009) have found that local network effects (among partners, friends, and family) play a role for customers in Italy. Their paper investigates the extent to which consumers take account of their contacts' mobile operators when choosing a provider for themselves. For this purpose Corrocher and Zirulia (2009) rely on a survey of 193 high-school and university students in Italy and show that these consumers are highly heterogeneous with respect to the importance they give to the operators chosen by their friends/family members in choosing which provider to use. Against this background, discounting on-net calls may be seen as a tariff innovation in order to compete for families or other "calling clubs".

This paper offers another, complementary explanation, which is based on recent observations from marketing science and behavioral economics. Starting from the observation that, in reality, many consumers are choosing calling plans that are not cost minimizing for them (Lambrecht & Skiera, 2006), it is argued that the bounded rationality of mobile telecommunications consumers may be exploited to some degree by operators, and that it may be more attractive for new entrants to offer plans with discounted on-net calls than for incumbents with a large installed customer base. If customers fail to weigh prices with the appropriate call minutes or probability of placing a certain call, but base decisions on unweighted prices, discounting certain call prices may be more attractive for newcomers than for incumbent operators, as will be argued below. This observation also offers a new perspective on the competitive effects of on-net price discounts.

The rest of the paper is now organized as follows: The next section reviews the related literature on consumer choice of multi-part tariffs and tariff choice biases as well as the literature on price discrimination between on-net and off-net calls. Section 3 describes the survey and presents the empirical analysis, before section 4 draws out policy conclusions. Finally, section 5 summarizes the main findings.

2. Related literature

In recent times, there has been a fastly growing literature on consumers' decisions between multi-part tariffs and various tariff choice biases. This literature usually finds that consumers fail to choose calling plan, which would minimize their expenses. Given that the four mobile network operators alone offer more than 400 different tariffs and that, as of 2010, there have been more than 150 mobile telecommunications service providers in Germany,[1] it is not really surprising that consumers do not choose the calling plan that would minimize their expenses. Even the neoclassical search cost literature, as initiated by Stigler (1961), has shown that, if consumers face search costs, it is not optimal to compare all the prices available in the market, but to limit one's search to a limited number of offerings. As mobile calling plans are rather complex, usually consisting of far more than ten single prices for various types of calls or data services (such as SMS etc.)

[1] The price comparison website www.teltarif.de/a/mobilfunk.html listed 156 mobile service providers as of 30 December 2010 (retrieved from http://www.teltarif.de/a/mobilfunk.html).