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## Phone a friend

**THE POTENTIAL FOR LARGE MOBILE NETWORKS TO USE DIFFERENTIAL CALL CHARGES AS A MEANS OF FORECLOSURE**

*In many countries mobile-to-mobile (M2M) access charges are set above cost; and the price of mobile phone calls to subscribers on different mobile networks ("off-net" calls) is higher than calls to other subscribers on the same network ("on-net" calls). This raises questions about the incentives on mobile network operators (MNOs) in setting M2M access charges and the relative position of large and small networks. Frontier's modelling work challenges the regulatory view that large operators may use high charges to foreclose their competitors.*

The price that a mobile customer pays for calling someone on another mobile network is often much higher than the price of calling someone on the same network. National Regulatory Authorities (NRAs) around Europe have been taking an increasing interest in these price differences and it seems to have become accepted by them that, if left unregulated, mobile networks have an incentive to set high M2M access charges; and →

that the resulting difference between the price of on-net and off-net calls can be used by large operators as a foreclosure weapon against smaller competitors.

The European Regulators Group (the ERG), in its consultation on appropriate remedies under the new EU framework<sup>1</sup>, argued that low on-net and high off-net charges put a small network “at a disadvantage” to large networks. The ERG refers to this as “tariff-mediated network externalities”. The Irish regulator, Comreg, in its notification to the EC on wholesale call access<sup>2</sup>, suggests that M2M access charges could be raised to “directly influence the retail tariffs of competitors in the mobile market and could cause potential margin squeeze issues”<sup>3</sup>.

The underlying argument advanced by both the ERG and Comreg runs as follows. Setting the M2M access charge above cost will mean that off-net calls are more expensive than on-net calls. Customers of a large network can be expected to make proportionately more on-net calls than the customers of a smaller network. Subscribers to the smaller network will therefore experience a higher average call charge than subscribers on the large network putting the small network at a competitive disadvantage. However, the academic literature does not support this view.

The early works on this topic by Armstrong (1998)<sup>4</sup> and Laffont, Rey & Tirole (1998)<sup>5</sup> found that networks are able to use their reciprocal access charges as an instrument of collusion: by raising each other’s costs, they can dampen competition and raise their profits. However, virtually all papers published subsequently call this conclusion into question. These indicate that, under more realistic assumptions, networks do not have a clear incentive to drive up reciprocal access charges. Such papers typically indicate that mobile operators would prefer to set M2M access charges at cost<sup>6</sup> which means that retail off-net call charges would also be set at cost.

Laffont, Rey & Tirole indicated that the collusive result was special to the case where networks are not able to charge any form of fixed rental charge (including periodic handset charges for pre-pay customers). However, work by Gans & King (2000)<sup>7</sup> suggested that it might actually be profit-maximising to set access charges (and hence retail off-net call charges) below cost when operators can discriminate between the retail price of on-net and off-net calls; while Carter and Wright (2003)<sup>8</sup> suggested that when networks are of unequal size, it is the stronger network that has the stronger incentive to set access charges at cost.

## OUR ANALYSIS

Frontier has designed a simulation model which we can use to compare the relative magnitude of the effects two-way access charges and on-net/off-net price differentials. This model enables us to answer a number of critical questions.

### Do high M2M charges advantage larger operators?

The model enables us to look at competition between two networks. Following the differentiated Bertrand approach, it is assumed that customers are distributed along a line, with the competing networks located at either end. The networks compete for customers by offering prices designed to maximise the welfare that customers would get from subscribing to their networks. Customers choose the network that they believe offers them the greatest welfare - taking into account a search cost that makes them inclined to favour the closest on the line. The degree of differentiation between networks can be controlled by adjusting the size of the search cost parameter. The higher the search cost, the more “differentiated” the networks and the lower the intensity of competition.

We begin by allowing networks to differentiate between on-net and off-net call-charges. The results of this analysis are given in Figure 1 which shows that, in the case of symmetric networks (i.e. two networks, sharing the market 50:50), operators would choose to set a reciprocal access charge below cost.

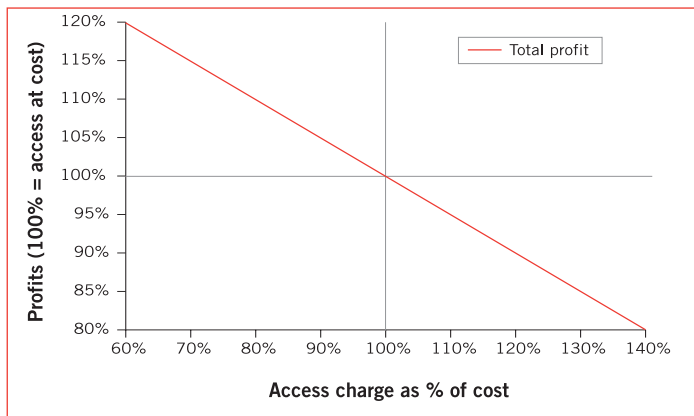


Figure 1: Gans & King - the effect of access charges on profits

Source: Frontier model

As M2M access charges increase, the value to each network of stealing each other's customers also increases. Higher M2M access charges therefore intensify inter-network competition, putting pressure on profits.

We then extended the work to model the situation where the two networks are of unequal sizes. We now have two conflicting pressures. On the one hand, there is a "static" effect: as noted earlier, if M2M access charges are set above cost then off-net calls cost more than on-net ones, and this favours the larger network. On the other hand, there is the "dynamic" effect illustrated in Figure 1: if access charges are set above cost all networks will put extra effort into winning market share, and this intensifying of competition reduces profits.

We therefore used our model to assess which one of these two effects was likely to dominate. We found that the dynamic effect is much stronger than the static one, regardless of the parameters chosen for the model, as illustrated in Figure 2.

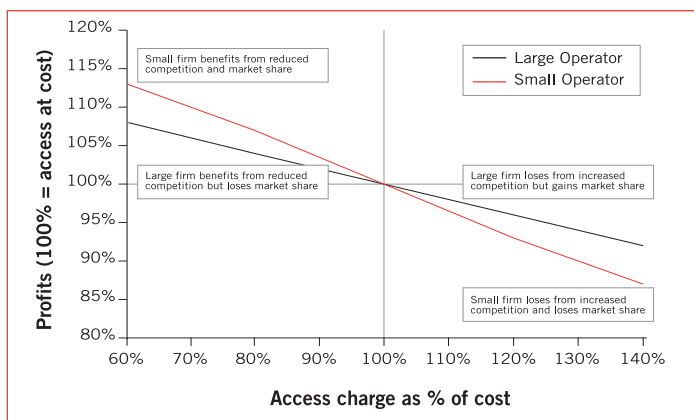


Figure 2: Sensitivity of profits to access charge with network asymmetry

Source: Frontier model

Even though high access charges would seem to give the larger network an advantage, it will still be wary of setting high access charges, because of the threat to profits from the stimulus to competition.

### What is the risk of predation?

Our modelling suggests that maintaining high (reciprocal) M2M access charges is not a profit-maximising course, even for larger networks. However, this does not resolve the question of the risk of predation. By definition, predation involves a dominant company engaging in behaviour that is not profit-maximising in the short run in order gain advantage in the long run.

We have therefore used our model to address the question of whether a dominant operator would find it easier to "buy" market share by raising access charges or by the more conventional means of cutting retail prices. Our results are shown in Figure 3.

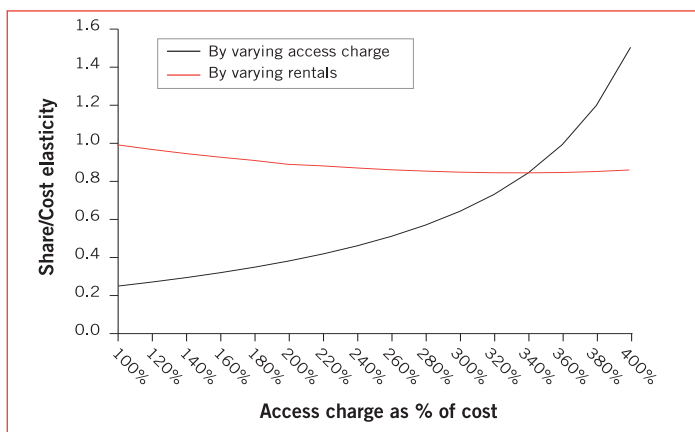


Figure 3: Relationship between market share gained and profit foregone by varying access charges or monthly rentals

Source: Frontier model

These results indicate that, provided access charges are in the vicinity of cost, cutting retail prices is a much more effective strategy for gaining market share than raising access charges. Only when access charges are already several times cost does it become more efficient for the dominant firm to try to use access charges to drive up its market share. The exact cross-over point depends on the strength of competition in the market and the degree of asymmetry between the large and the small players but this result holds at all plausible values for these parameters.

### CONCLUSION

These findings are the basis for an understanding of the dynamics of competition in asymmetric telecoms markets. High M2M access charges intensify competition between operators, and this effect is stronger than any static price advantage that large operators get from on-net/off-net differentials. This calls into question the received wisdom that high M2M access charges and on-net/off-net differentials favour large incumbents. Furthermore we have shown that, unless access charges are very substantially in excess of cost, it is more effective for the dominant firm to use retail price competition rather than high access charges to raise its market share. This reinforces our view that the risk of on-net/off-net differentials being used as a foreclosure mechanism is small.

Perhaps this should not be a surprise. It is worth noting that in many countries (including the UK and Germany), it was the entrants (Orange and One2One in the case of the UK) and not the existing incumbents who first introduced on-net/off-net differentials. That would have been a curious strategy if such differentials naturally disadvantaged the small player.

\* This bulletin summarises one of the issues relating to mobile access charges addressed in *Two-way access charges and on-net/off-net differentials*, a paper presented by Dan Elliott to the IDEI conference on Electronic Communications in Toulouse, October 15-16, 2004.

<b>SOURCE</b>	<ol style="list-style-type: none"> <li>1. "Consultation Document on a Draft joint ERG/EC approach on appropriate remedies in the new regulatory framework", 21st November 2003.</li> <li>2. "Response to Consultation and Notification to the European Commission – Wholesale voice call termination on individual networks", Comreg Doc. No. 04/62a, 8th June 2004.</li> <li>3. See para. 4.35.</li> <li>4. Armstrong, M. (1998), "Network Interconnection In Telecommunications", <i>Economic Journal</i>, 108 (May), pp. 545-564.</li> <li>5. Laffont J.J., Rey P. and J Tirole (1998), "Network Competition I: Overview and Nondiscriminatory Pricing", <i>RAND Journal of Economics</i> 29 (1-37)</li> <li>6. If charges were set reciprocally and without the risk of arbitrage with F2M access charges.</li> <li>7. Gans, J.S &amp; King, S.P. (2000), "Using 'Bill and Keep' Interconnection Arrangements to Soften Network Competition".</li> <li>8. Carter M. and W. Wright (2003), "Asymmetric Network Interconnection, <i>Review of Industrial Organisation</i> 22 (27-46).</li> </ol>
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