



Bulletin

Water
 Energy
 Retailing
 Transport
 Financial services
 Healthcare
 → **Telecoms**
 Media
 Post
 Competition policy
 Policy analysis and design
 → **Regulation**
 Strategy
 Contract design and evaluation
 Dispute support services
 Market design and auctions

JUNE 2005

Wrong numbers

DIFFICULTIES IN ESTIMATING THE WELFARE GAINS FROM REGULATION

Regulators and their government masters are under some obligation to demonstrate that their interventions actually benefit consumers. The Competition Commission's inquiry into mobile phone call charges illustrates the pitfalls. The Commission's attempts to quantify the welfare gains of its proposals, which have attracted widespread interest amongst European regulators, suffered from defects that led to a serious over-estimation of the potential benefits from regulation. This bulletin explores the weaknesses in the Commission's analysis.

During 2002, the UK Competition Commission carried out an inquiry into fixed-to-mobile call termination charges. During this inquiry Frontier acted as economic advisers to Vodafone. The central questions addressed in this inquiry were whether these charges required regulation and, if so, at what level. In seeking to answer these questions, the Competition Commission attempted to measure the welfare benefits of regulation. Unfortunately, the method that the Commission applied was flawed. →

To determine the impact of regulation on welfare, the Commission attempted to measure the changes in “consumer surplus” resulting from alternative prices. This is the term economists use to describe the difference between what consumers pay for something and the value they ascribe to it – that is to say, the difference between what they actually pay and the maximum they would be prepared to pay. Regulation of call termination charges could be said to result in welfare gains if it increased consumer surplus.

The Commission started from a position that is generally accepted, namely that – in the absence of any regulation – the charge that mobile networks would levy on fixed networks for terminating calls might be set above efficient levels. Such a distortion would tend to lead to a reduction in overall consumer surplus, as well as transferring surplus from consumers who only use fixed-line telephony to consumers who only use mobiles.

However, fixed-to-mobile call termination charges do not exist in a vacuum. They are part of a complex package of charges, including those for calls from mobile to mobile or mobile to fixed lines, as well as for monthly subscription charges and the price paid for phone handsets. Changes in one particular charge can be expected to have knock-on effects on others, and an estimate of the total effect on consumer surplus must take this into account. Regulating the price at which operators sell one product (call termination) which is linked to the sale of others (subscription and outgoing calls) is more complex than traditional utility regulation, and the welfare gains are much more difficult to calculate.

MODEL BEHAVIOUR

The Competition Commission divided the services provided to customers by mobile networks into three groups: subscription to the network (which includes handset prices), outgoing calls and call termination. These services are clearly linked. For example, subscribers who want to make calls are required to subscribe to a network first.

At the same time, competitive pressures affect the three types of service differently. Operators may wish to compete by subsidising subscription charges, recouping the expense by increasing call charges above cost. However, since additional profits made on charges are likely to be competed away in the market for subscriptions, the overall effect on consumer surplus of high termination charges is likely to be much less than might be supposed from looking at call termination in isolation.

In order to estimate the optimum level of mobile termination charges, Frontier constructed a model representing demand for the three services through a series of inter-linked demand functions. The model allowed for both own-price and cross-price elasticities and included the presence of network externalities through parameters that linked the demand for mobile calls and fixed-to-mobile calls to the number of mobile subscribers. We used the model to calculate a set of prices that would maximise consumer surplus, under a given set of cost assumptions.

While the Commission did not use this model (or similar ones submitted by other parties) to determine optimal fixed-to-mobile termination charges, it did try to use them to determine the impact of different call termination rates on consumer welfare. It then used this analysis to support its justification for regulating call termination charges. Problems arose from the way in which the Commission used these models.

STARTING AT THE WRONG END

The Commission sought, by means of discussions with market operators, to make a realistic assumption as to the level of call termination charge that they might levy if this charge were not regulated at all. These discussions yielded a guesstimate of 17 pence per minute (ppm), at the time of the inquiry in 2001-02. The Commission then sought to calculate the level of consumer surplus at this and two other levels of charge: 10.5 ppm, which was the average actual charge at the time, and 6 ppm, which was the level which the Commission thought would be a “fair charge”. (Note that these are wholesale termination charge levels, rather than retail prices, which in all

Wrong numbers

cases would be higher by the fixed operators' margins.) The Commission wanted to test the potential benefits of tightening regulation as well as the potential disbenefits of removing regulation altogether.

The Commission's estimates for the level of consumer surplus at each of these three levels of fixed-to-mobile charge are reproduced in Table 1 below. These suggested that considerable welfare gains were achieved by regulating termination charges, and that these could be significantly increased by a further downward push.

Fixed-to-mobile call termination charge, 2001-02	Total consumer surplus (£m per quarter)	Change in surplus from current charge level (£m per quarter)
6 ppm (Commission's "fair charge" level)	3,280.9	+54.4
10.5 ppm (current level)	3,226.5	
17 ppm (unregulated level)	2,822.7	-403.8

Table 1: Fixed-to-mobile charges and consumer surplus: Commission estimates

Source: Competition Commission

The key issue, of course, is how the Commission calculated these effects. The method was clearly problematic. Instead of using the models to generate optimum prices in different conditions, the Commission chose to fix some assumptions in order to get the models to "solve" at the call termination charges that it wanted to consider. It did so by, in effect, increasing and decreasing assumptions about the level of fixed and common costs (i.e., those applying to all services), which naturally had a powerful effect on the level of charges generated by the model.

This approach had one obvious flaw. It had the effect of raising all charges proportionately (for the "unregulated" termination scenario) and decreasing them all proportionately (for the "fair charge" scenario). This explains why the changes in consumer surplus are so large, particularly for the "unregulated" scenario. But this was the answer to the wrong question. Rather than estimating the welfare effect of raising call termination charges, the Commission had instead measured the welfare effect of a substantial increase in the mobile industry's cost base.

Self-evidently, an increase in the price of all products will have an adverse impact on consumer surplus; and the conclusion that consumer surplus is significantly greater with lower levels of costs is scarcely surprising. To be fair to the Commission, it did try to compensate by deducting the value of the increased costs that it imposed from the estimate of the reduction in consumer surplus – but here as elsewhere, two wrongs do not make a right. By using an assumption (higher fixed costs) that put upward pressure on all charges, the Commission simply did not allow for the fact that a rise in one might be more or less compensated for by a fall in another. With a constant level of fixed and common costs, an increase in the fixed-to-mobile termination charge could be expected to lead to a reduction in other mobile tariffs (as discussed in Frontier's bulletin *Patching Up the Waterbed* on the "waterbed effect", the graphic phrase describing these ups and downs), not to an increase¹.

GETTING THE RIGHT ANSWER

At Frontier, we therefore used our own model to perform an analysis of the welfare impact of different termination charges. We did so in a way deliberately designed to use the same assumptions as the Commission in all but its peculiar treatment of fixed costs: we used an identical system of demand equations and the same assumptions as the Commission with respect to marginal costs.

For each of the Commission's chosen levels of fixed-to-mobile termination charges, we used the model to estimate the subscription and mobile outbound charges that would

Wrong numbers

maximise consumer surplus. This process in effect identifies the level of other charges that mobile operators could be expected to set in a competitive market. It has the plausible property that increases in call termination charge result in lower equilibrium mobile outbound and subscription charges, not the higher ones predicted by the Commission's approach. Table 2 shows the consumer surplus at each level of fixed-to-mobile charge.

Fixed to mobile call price	Total consumer surplus (£m per quarter)	Change in surplus from current price level (£m per quarter)
6 ppm (Commission's "fair charge" level)	3,280.9	+4.7
10.5 ppm (current level)	3,276.2	
17 ppm (unregulated level)	3,213.2	-63.0

Table 2: Fixed-to-mobile charges and consumer surplus

Source: Frontier Economics analysis

This table indicates that the welfare gain in moving from the then current level of charges to the Commissions' proposed "fair charge" would have been extremely modest – less than 10% of the gain suggested by the Commission. It therefore contradicts the Commission's conclusion that there were substantial welfare gains to be made from further reducing fixed-to-mobile termination rates. The evidence of our model, when used correctly, is that there would have been very little welfare gain.

CONCLUSION

It is generally acknowledged that in the absence of any regulation, mobile operators are likely to set termination rates above efficient levels so to increase the subsidies that can be offered to their own subscribers. In the presence of a threat from one mobile operator to increase termination rates, all operators are likely to increase rates to ensure that they are able to offer retail subsidies in line with the first operator.

But care is needed in basing arguments for regulatory intervention to reduce termination charges on estimates of welfare gains, or reductions in consumer surplus. The impact on other, linked, charges, which may rise in response, has to be taken into account. The calculations of consumer surplus presented here suggest that the gains from regulating mobile termination charges are likely to be relatively modest, and the gains from further downward pressure on termination charges may be insignificant. Given the level of uncertainty, acknowledged by the Commission, as to the exact efficient level, the benefits of reducing termination charges from their existing level were highly questionable.

When used correctly, the models that Frontier (and other parties) produced provide a powerful contribution to the debate regarding the future of telecoms regulation. They have already demonstrated that mobile call termination charges cannot be considered in a vacuum. The challenge now is to develop such tools, to enable a debate on mobile subscription charges to be conducted by regulators and operators in a theoretically coherent fashion.

SOURCE	1. See "Patching Up the Waterbed"; Frontier Bulletin March 2005 for a discussion of the "waterbed effect", the graphic phrase describing these ups and downs.
CONTACT	Dan Elliott dan.elliott@frontier-economics.com
	George Houpis george.houpis@frontier-economics.com
	Frontier Economics Ltd 71 High Holborn London WC1V 6DA
	LONDON COLOGNE MELBOURNE SYDNEY
	www.frontier-economics.com