

Mobile Termination Charges: Calling Party Pays *vs* Receiving Party Pays

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Abstract

There has been widespread concern at the level of mobile termination charges, leading to increasingly severe price controls. Oftel and the Competition Commission identified the Caller Pays Principle (CPP) as the source of the market power that enabled termination charges to be set above cost. Both accepted that the alternative Receiver Pays Principle (RPP) would solve the monopoly problem, but rejected it primarily because RPP might lead to significant numbers of users switching off their mobile phones.

Evidence from RPP countries is consistent with RPP solving market power problems. CPP is almost certainly less efficient than RPP. US and other evidence suggests that the argument about customers switching off phones is not tenable. If the aim is efficient resource allocation, undistorted by excessive termination charges and subsidised handsets, to be achieved by competition rather than price controls, then RPP is preferable to CPP.

JEL classification: L51, L96

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Mobile Termination Charges: Calling Party Pays versus Receiving Party Pays

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Introduction

Mobile termination charges – the charges that mobile operators levy on each other and on fixed network operators for terminating calls on their networks - have become an increasing focus of concern in most countries throughout the world. The level of these charges is perceived to be high both in absolute terms and in relation to termination charges on fixed networks. Insofar as there are now (since 2002) more mobile subscribers than fixed subscribers, such charges are perceived to be increasingly important, and to constitute an inhibition on the growth of telecommunications services generally.² Increasingly, the charges have become the object of regulatory attention.³

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² E.g. “In most countries across the world, termination on mobile networks is significantly more costly than termination on fixed networks. ... excessive interconnection charges can be cited as a serious inhibitor to future growth of national and international traffic in mobile networks.” Valerie Feldmann (consultant), “Mobile Overtakes Fixed: Implications for Policy and Regulation”, ITU Strategy and Policy Unit, June 2003, p. 6 (available at <http://www.itu.int/osg/spu/ni/mobileovertakes>)

³ E.g. “With growing amounts of international traffic flowing to mobile handsets, mobile termination costs have become an increasingly important issue for international carriers, consumers, and regulatory agencies. ... The grave reality of these effects, exacerbated by burgeoning call volumes, has fomented a complete reversal in regulatory trends over the past few years. Where national regulatory agencies (NRAs) were once more concerned with stimulating the industry growth and competition, often through implementing calling party pays (CPP) payment structures and pricing constraints on fixed interconnection, they are now scrutinising the charges levied for connection to the networks and, in some cases, intervening on behalf of fixed-line operators.” *Telegeography 2004*, pp. 48, 51

Regulation of mobile termination charges has perhaps been most thoroughly analysed and is of longest standing in the UK. RPI-9 price controls on the two largest operators were put into effect from 1998 to 2002, requiring termination charges to be reduced by 9 per cent per year in real terms. After a lengthy consultation and investigation, Oftel concluded at the end of 2001 that mobile termination charges were still substantially in excess of cost. It proposed price controls of RPI-12 for the next four years on the four mobile companies Vodafone, O₂ (formerly BT Cellnet), Orange and T-Mobile (formerly One2One). The companies objected and the matter was referred to the Competition Commission (henceforth the Commission).

The Commission broadly endorsed Oftel's proposals. It concluded⁴ that competitive pressures did not constrain termination charges; that termination charges should in principle be cost-reflective; that they were presently some 30 to 40 per cent in excess of a fair charge (and at present levels would be up to double the fair charge by 2005/06); that this led to a series of public interest detriments that were not offset by public interest benefits that could justify their continuation; that a price cap was the only remedy likely to address these detriments effectively; and that this price cap should be at the rate of RPI-15 for the next four years. The Commission considered that this would yield significant welfare gains without an increase in average retail prices or a significant loss of retail subscribers. The Commission thus recommended an even more severe price cap than Oftel, requiring termination charges to reduce by 15 per cent per year for the next four years. The companies took the Commission to judicial review, but without success. The price cap is presently in course of implementation.

Other countries have followed the UK lead. Formal or informal regulatory pressures have been applied to mobile termination rates in many European countries⁵, and in Australia and Japan.⁶ The US, whose mobile network is not characterised by high mobile termination rates, has expressed concern

⁴ *Vodafone, O2, Orange and T-Mobile*, Competition Commission report presented to Oftel, December 2002, published 2003. (Henceforth this publication is referenced as CC)

⁵ E.g. "the UK, French, Italian, Dutch and Portuguese regulatory authorities have decided to introduce significant CPI-X per cent price cap reductions for mobile termination services that mobile operators will be obliged to implement over the coming years." *Mobile Services Review 2003*, ACCC, April 2003.

⁶ E.g. Crandall and Sidak, 2004, pp. 8-15.

about European practices.⁷ The FCC has been considering whether to take action.⁸ It has now “announced that it will issue a Notice of Inquiry to evaluate the effect of high foreign mobile termination rates on US consumers and competition”.⁹

Is widespread and severe regulation really needed in what otherwise seems to be a flourishing and competitive industry? Economists differ as to the seriousness of the problem, and as to the appropriate remedy.¹⁰

Some have argued or assumed that price controls are needed to deal with market power, and have focused on precisely how these should be set – for example, whether termination charge should be equal to marginal cost, or above it by an allowance for consumption externalities.¹¹ Others have questioned whether the welfare loss associated with excessive termination charges is as significant as Oftel and the Commission assumed. Yet others have suggested that any market failure can be overcome in other ways, including by facilitating more competition to provide termination services or by increasing customer information.

There seems to be recognition, not least by Oftel, the Commission and among economists that have studied the matter, that the high termination

⁷ “The European Union, long a leader in both international traffic and mobile penetration, has been most notorious for its pronounced interconnection price differentials (occasionally as severe as 2000 percent), attracting vociferous complaints not only from European fixed-line operators but also from bodies such as the Office of the United States Trade Representative (USTR) and the Federal Communications Commission (FCC).” *Telegeography 2004*, p. 52. See also Crandall and Sidak 2004 pp. 19-22.

⁸ “the [Federal Communications] Commission has acknowledged the increasing concern that US carriers and consumers originating international calls from fixed networks in the US may bear the burden of such subsidies [from fixed to mobile networks, see below]. In October 2002, the Commission initiated a proceeding in which it sought comment on the issue of high foreign mobile termination rates and their effect on US consumers and competition.” *Annual Report and Analysis of Competitive Market Conditions With Respect to Commercial Mobile Services, 8th Report*, WT Docket No 02-379, FCC 03-150, 14 July 2003, para 203, p. 89. (Henceforth *8th Mobile Report*) and fn 654, p. 91.

⁹ FCC Press release 11 March 2004.

¹⁰ See Crandall and Sidak 2004 for a recent summary; also Feasey (2004) for a forthcoming collection of papers on the Commission’s report.

¹¹ This assumes, as explained shortly, that a termination charge above marginal cost leads to a subsidy on handsets or connection/subscription charges, and thereby encourages more subscribers to join the network, which is assumed to be beneficial for other subscribers.

charges reflect monopoly power created by the arrangement of Caller Pays Principle (abbreviated to CPP) that is used throughout Europe and most other countries. The main alternative to the CPP arrangement is the Receiver Pays Principle (RPP)¹² as used in North America, China and a few other Asian countries. In the RPP countries termination charges are significantly lower and there seems to be no need for regulation of them.¹³

Few economic papers seem to have looked in any detail at RPP as an alternative to CPP, but those that have tend to favour it. Doyle and Smith (1998) explain why RPP would change the incentives on mobile operators and increase competition. Crandall and Sidak (2004) expand on this and examine experience in US and Canada. They conclude that “MPP [RPP] is the better option for pricing mobile calls”. In their view “CPP *without price regulation* is a second-best solution”. (p. 45 italics in original)

Yet there has been no move from CPP to RPP; in fact at least 27 countries have changed from RPP to CPP since 1991.¹⁴ Oftel and the Commission raised the possibility of changing to RPP but dismissed it rather cursorily. The purpose of this paper is to explore this option more thoroughly.

The material is grouped in six main sections:

- An economic analysis of the call termination market and problem, as reflected in the Oftel and Commission reports, and the analysis of economists
- the impact of CPP on the allocation of resources and the welfare gains and losses
- the views of Oftel and the Commission on the advantages and disadvantages of RPP

¹² In the US the terms Mobile Party Pays (MPP) and Wireless Party Pays (WPP) are used instead of Receiving Party Pays (RPP). For the avoidance of doubt, RPP, MPP and WPP do not mean that the receiving/mobile/wireless party pays the whole of the cost: the calling party still pays an originating charge towards the cost of call origination.

¹³ E.g. Ben Petrazzini, Fixed-Mobile interconnection case studies, ITU Strategies and Policy Unit, Fixed-Mobile Interconnection Workshop, ITU New Initiatives Program, Geneva, 20-22 September 2000; Feldmann, Figure 9 p. 25; Crandall and Sidak 2004. See also the discussion in section 6 below.

¹⁴ Stefan Zehle, “CPP Benchmark Report”, Coleago Consulting Ltd, 23 February 2003, Figure 1, p. 2. (available at <http://www.coleago.co.uk/downloads.php>). 21 of these countries are from Central and South America and the Caribbean; the remaining six in chronological order are Czech Republic, Mongolia, Cambodia, Romania, Pakistan and India.

- CPP, RPP and the efficient pattern of calling
- the reported phenomenon of switching off of mobile phones, and the experience of developing countries overseas that use RPP including those that have changed to CPP
- the experience of RPP in the USA and a comparison of .termination charges, prices, penetration ratios and usage.

A final section concludes.

1. Economic analysis of the call termination market

At first sight, the high level of mobile termination charges presents a paradox. On the one hand, the mobile sector has been characterised by outstanding performance over the last few years. This includes new entry, rapid growth in number of mobile phones and subscriber penetration, price reductions and quality improvements, significant innovation, and in general all the signs of a competitive industry. This is particularly the case for the UK - the FCC notes that “The UK is widely regarded as the most competitive large mobile market in Western Europe.”¹⁵ - but it is true elsewhere too. On the other hand, the charges for terminating calls on mobile networks have remained stubbornly high: the Competition Commission calculated that they were 30 to 40 per cent above what it called a fair charge¹⁶ and the widespread objections to the charges have been noted above. How are these two elements mutually consistent?

a) Inadequate competition?

Part of the explanation might be that the mobile market is not as competitive as it seems. Oftel has argued that while competition in the mobile sector is developing, the market is not yet fully or effectively competitive, only ‘prospectively competitive’.

As evidence for this lack of fully effective competition Oftel instanced the very high profit rate achieved by Vodafone. A counter to this argument was

¹⁵ *Annual Report and Analysis of Competitive Market Conditions With Respect to Commercial Mobile Services, 8th Report*, WT Docket No 02-379, FCC 03-150, 14 July 2003, para 203, p. 89

¹⁶ The Commission based this ‘fair charge’ on “the Long Run Incremental Cost (LRIC) of call termination (including fixed and common network costs) and a mark-up for relevant non-network costs.” (CC p. 4) There was also “a small mark-up for the network externality”.

that the average profit rate in the mobile sector as a whole was far from excessive. The other companies were barely covering their costs of capital or in some cases making losses. Vodafone's explanation for its own high profits was essentially superior efficiency: a better and more profitable mix of customers and a better designed and managed network with lower costs.

The Commission "broadly concurred" with Oftel's view that "persistent high returns were difficult to reconcile with a competitive sector, because over time competitors should be able to replicate efficiencies or produce rival innovations". However, it noted that "Vodafone's returns have been earned in a period when the mobile phone market has been expanding extremely rapidly" and in these circumstances "we do not conclude that Vodafone's high profit levels ... demonstrate, in themselves, ineffective competition". (p. 48)

The Commission in fact found that there was "intense competition among the mobile network operators (MNOs) to attract and sign up subscribers to their networks". However, there was "less effective competition in call origination". Furthermore, "each of the MNOs has a monopoly of call termination on its own network". "All of this indicates, in our view, less than effective competition at the retail level." (CC para 2.211)¹⁷

b) The effect of CPP on termination charging

Nevertheless, the effectiveness or otherwise of competition at the retail level was not the explanation for the high level of termination charges. The explanation for the latter, as proposed by Oftel and accepted by the Commission, lay in the monopoly of termination.

Each mobile network operator has a monopoly of the termination of calls made to subscribers on its own network. Adoption of the "caller pays principle" (CPP) means that mobile operators can charge other operators for termination, and these other operators – and hence their subscribers - have to pay these charges (or find alternatives to making the call). It is therefore plausible that each mobile operator should wish to charge a monopoly price for access by subscribers of other networks.

¹⁷ This conclusion is broadly consistent with Oftel's analysis. For Oftel's more recent views, see Wholesale mobile voice call termination consultation, 19 December 2003.

However, if there were only mobile operators to consider, and if their subscribers made roughly the same number of calls to each other (as is broadly the case in the UK), it is arguable that the mobile operators would not find it worthwhile to charge each other for termination. Doing so would be costly in terms of administration and collection, and would simply circulate revenues between them to no good effect. Indeed, increasing the prices of 'off-net' calls (calls made to subscribers of other networks) would reduce the use and potentially the profitability of the mobile networks as a whole.

In practice, the market comprises fixed as well as mobile operators. Indeed, in most countries the majority of the calls for which termination charges are levied come from fixed network operators (FNOs) rather than from other mobile operators¹⁸. In the UK (and many other countries) the termination charges levied by the fixed operators (such as BT) are regulated and capped at about equal to cost. If the mobile operators set their termination charges above cost, and the fixed operators do not, there is a net flow of revenue from the fixed network and its customers to the mobile networks and their customers. This may more than compensate for the loss of business from higher charges. Hence, in these circumstances, high termination charges are potentially profitable for mobile operators.¹⁹

But are the mobile operators able to keep these increased revenues from the higher termination charges? Not if the mobile sector is competitive. Each additional subscriber is likely to be called by subscribers on other mobile and fixed networks, so will bring a flow of termination charge revenues to the mobile operator. Each mobile operator will therefore try by a variety of means to attract subscribers to its network. This may involve incurring marketing costs, cutting other prices, and offering various subsidies. As the Commission put it, "There is vigorous competition among the MNOs to attract and sign up subscribers to their networks, for example through the payment of incentives and discounts to retailers, and handset subsidies to

¹⁸ "Calls to mobiles from FNOs accounted for a much larger proportion (70 per cent) of termination minutes than off-net calls (about 30 per cent) in 2001/02 (mobile-to-mobile, or on-net calls, do not attract termination charges), and provided nearly all the MNOs' net revenue from call termination charges in that year." (CC p. 3)

¹⁹ The FCC is quite explicit about this cross-subsidy. "In effect, high termination rates on fixed-to-mobile calls have served to promote the development of the mobile telephone industry in Europe by directing subsidies from established fixed-line services to mobile services." *8th Mobile Report*, para 210, p. 91.

customers, but this is funded by excess returns from termination charges.” (CC p. 4) The Commission calculated that “the average net cost of acquiring a new customer was around £100”. (p. 52)

In the limit, mobile operators would find it worthwhile to spend up to the expected value of the net revenue from termination charges in order to attract new subscribers. The more competitive the market, the more likely this is to happen, because the mobile operators have no alternative but to do so.²⁰ Conversely, the less competitive the retail market, the more that the surpluses would remain with the operators instead of being passed through to the subscribers.

This analysis explains how high termination charges facilitated by the CPP principle are consistent with different degrees of competition in the mobile sector as a whole. This explanation is consistent with the evidence of relatively strong performance and competition in the UK mobile sector. However, it also implies that increasing competition in the mobile sector will not bring relief from the problem of high termination charges as long as the CPP principle continues to apply. Even new entry associated with the potential development of third generation technology would not overcome the problem. In other words, if price controls are considered necessary to combat high mobile termination charges, they would seem to be a permanent rather than transitional phenomenon.

c) Views of economists

A number of economists have analysed network termination charges in recent years.²¹ There seems to be widespread acceptance of the general proposition that, with CPP and under market conditions typically obtaining, mobile operators do have market power over terminations and have an incentive to exercise this by setting high termination charges. These charges may be at the monopoly level, even in the face of competition between mobile networks. They may even be above. For example, if callers do not

²⁰ “Vodafone said there was nothing ‘discretionary’ about its marketing expenditure: it was a sign of how effective competition was that each MNO was forced to incur ever greater costs to win and retain subscribers, up to the point at which any excess profits were competed away.” (CC p. 50)

²¹ E.g. Armstrong 1998, Doyle and Smith 1998, Gans and King 1999, Jeon et al 2001, Wright 2002, Crandall and Sidak 2004, Gans et al 2004. In fact, the chairman of the Commission panel had earlier written on this topic, Geroski et al 1989.

know the level of charges applicable to a particular call and assume it to be at the average level charged by all operators, then larger operators would have an interest in reducing charges if that increased total traffic in the sector, but small operators including new entrants would find it profitable to set higher charges.²²

2. Welfare gains and losses

The views to the Commission, and its own conclusions, were a mixture of concerns about income distribution and real resource loss.

a) views of the parties and the Commission

If the mobile market is competitive, does the precise pattern of charges matter? The mobile operators argued that it did not: “because most people now have a mobile phone, what consumers lose in paying high termination charges they gain on cheap handsets and competitively priced on-net calls.” (CC p. 4)

The Commission rejected those arguments.

Some callers to mobiles from fixed-line telephones or from payphones do not themselves own a mobile phone, and so subsidize mobile customers through high call termination charges, with almost no reciprocal benefit. Moreover, to the extent that callers with both fixed and mobile phones use their fixed lines to call mobiles more than they use their mobile phone, they suffer a detriment due to the high termination charges of the MNOs. The high prices of fixed-to-mobile, and low prices of on-net, calls also tend to skew usage from the lower-cost (that is, fixed) technology to the higher-cost (that is mobile) technology. (CC p. 4)

The Commission summarised (CC p. 5) the public interest detriments of the excessive termination charges as follows:

- a) consumers pay too much for fixed-to-mobile and off-net calls
- b) as a result, too few fixed-to-mobile calls are made
- c) some consumers (those who make more higher priced calls) unfairly subsidise other consumers (those who make more lower price calls or mainly receive calls or who make little use of their mobile phones)

²² Gans and King 1999, Dewenter and Haucap 2003.

- d) there are significant distortions in competition: undervaluation of handsets by customers and greater turnover or ‘churn’ of customers between networks, leading to greater expenditure in mobile customer acquisition
 - e) greater use of higher-cost (mobile) technology at the expense of the lower-cost (fixed) alternative.
- b) income distribution and real resource loss

Some of these items - the quoted view of the mobile operators, the Commission’s rejection of this, and the first and third of the Commission’s detriments - are essentially about transfers of income or revenue. Such transfers - from consumers to producers, or from one set of consumers to another – may be a public policy concern, but they do not involve what economists would call real resource costs.

The implication of the quoted operators’ view, and indeed of the economic analysis of this issue that the Commission broadly accepted, is that the net transfer of income from consumers in aggregate to producers in aggregate is minimal. Therefore, to the extent that the Commission gave weight to these income transfer detriments, it was taking a view on behalf of particular subsets of customers (those who made more fixed-to-mobile and off-net calls) and against other subsets of consumers (those who made more on-net calls or mainly received calls or made little use of their mobile phones). It was not acting to increase benefits to customers generally.

The other detriments do involve real resource costs. They involve a comparison with the allocation of resources assumed to obtain in a fully competitive or ‘optimal’ benchmark situation. The contention is that, under present arrangements with termination charges in excess of cost and handset prices and other charges below cost, excessive resources are devoted to certain goods and services (handsets, the acquisition of mobile customers and the use of mobile networks generally) while inadequate resources are devoted to other uses (the number of fixed-to-mobile calls and the use of fixed networks generally). As a result, the presumption is that customers as a whole are worse off than if the resources available were used in the way that customers would most prefer.

The Commission did not go into detail on these points. For example, after listing the detriments of the present level of charges, its Summary simply

comments that “We did not find that there were ... any offsetting public interest benefits arising from the termination charges set by the four MNOs being in excess of the fair charge, which could justify their continuation.” (CC p. 5)

c) characterising the benefits and detriments

It is worth exploring a little more what these “offsetting public benefits” might be. The ‘misallocated’ resources are not wasted; they do not produce goods and services of no value at all. Rather, they produce goods and services that customers do value, albeit assumed not as highly as the preferred goods and services. In fact, the economic model set out above implies that the then-obtaining set of prices yields a set of benefits essentially corresponding to the inverse of the detriments identified by the Commission. That is, as a result of the higher termination charges that presently obtain:

- a) consumers pay less than they otherwise would for on-net mobile calls
- b) as a result, more on-net mobile calls are made
- c) some consumers benefit from subsidies from other consumers
- d) handsets are less costly to customers than they otherwise would be, changing networks is also easier and less costly, and mobile operators devote more resources to acquiring and keeping customers than they otherwise would
- e) mobile calls are less expensive than they otherwise would be, relative to fixed calls, so that mobile networks offer more effective competition to the incumbent fixed networks than they otherwise would do.

It is not clear that higher customer acquisition costs are an unambiguous disadvantage. Based on what is said in the Commission report (CC pp. 50-54), higher termination charges and the consequent greater attractiveness of customers mean that there is more frequent upgrading of handsets, mobile operators pay greater attention to designing and offering packages including tariffs that will appeal to customers, greater attention is paid to informing customers about the alternatives available, there is greater choice including of payment arrangements, retailers have greater incentive to be more attractive to customers, and customer care costs are higher than they otherwise would be. Thus customer acquisition costs are higher because the quality of customer service is higher.

This is not to argue that this list of benefits (some of which are transfers of income and others of which reflect real resource costs) outweighs the Commission's list of detriments. Rather, it is to emphasise that the system of high termination charges and low access charges has benefits as well as detriments. Consequently, any reform to that system is likely to involve reducing benefits as well as reducing detriments. The key question for public policy is not whether some new arrangement such as a tighter price cap will reduce the identified detriments, but whether that reduction in detriments outweighs the reduction in benefits.

d) quantifying the costs and benefits

The calculation of the costs and benefits of the present arrangements, and of changes to them, is therefore of considerable importance. Given the complex interrelationships between termination charges and the different kinds of call charges, subscription charges and handset prices, some sophisticated modelling might be expected. This was indeed the case. It seems that all the mobile operators hired consultants to model the situation, as did OfTel and the Commission itself. There was then a lengthy and detailed debate about the appropriate models and assumptions. In its Appendix 9 the Commission describes at some length these models and the contested assumptions and the discussion process.

The Commission's own conclusion was that "Regulating termination charges from current levels produces welfare gains (in net present value NPV terms) of around £700 million (with an immediate reduction in charges) and around £325 million (with a progressive reduction in charges) over the three year control period." It is unfortunate, however, that neither the summary nor the conclusions chapter gives any outline of the Commission's own assumptions and the implications of its model for prices, call charges, number of subscribers, and so on. The debate may have been accessible to the participants, but it is difficult for an outside observer to understand and appraise the Commission's position. The adequacy of the Commission's assumptions therefore becomes somewhat a matter of faith.²³

These assumptions are particularly sensitive given the remarkable diversity of views among the companies on all the parameters in the models used, and

²³ There is some further discussion of OfTel's cost-benefit analysis in OfTel, Wholesale mobile voice call termination consultation, 19 December 2003, annex L.

the considerable criticism of the Commission's assumptions and conclusions. For example,

Professor James Mirrlees of the University of Cambridge explains that the welfare gains that could be realised by a move toward regulation of mobile call termination rates would be modest at best. Mirrlees estimates that the annual welfare increase would be roughly one tenth the size of the benefits upon which the UK's Competition Commission relied in justifying its price cap on mobile termination rates (£4.7 million versus £54.5 million). He argues that the Commission failed to understand that, as mobile termination rates increase, mobile operators lower other mobile rates, which stimulates mobile subscriptions and increases welfare in the unregulated scenario.²⁴

e) the waterbed effect

The notion that, as mobile termination rates increase, mobile operators lower other mobile rates, was known as "the waterbed effect". This succinctly encapsulates the economic analysis of the termination market as set out above. It works both ways of course. If termination charges are reduced, then it will be less profitable to subsidise customers into the network. The prices of handsets, access and on-net calls will therefore increase as a consequence of the fall in revenue from termination charges.

The extent of the waterbed effect impacts on customers and mobile operators in opposite directions. A 100 per cent waterbed effect implies that companies will recover all the lost revenues from a reduction in termination charges – but by the same token this implies that benefits to customers from the termination charge reductions will be heavily offset by the countervailing increases in other charges. Similarly, a zero waterbed effect means that a reduction in termination charges yields maximum benefits to customers. However, it allows no offsetting increase in other revenues to mobile companies, and hence may call into question their continued viability.

Oftel's dilemma on this issue is therefore understandable. At one point it assumed a 50 per cent waterbed effect, arguing that 50 per cent of the

²⁴ Crandall and Sidak 2004, p. 4, citing the witness statement of Mirrlees in the judicial review, 5 March 2003.

reductions in termination charges would be recovered in the form of increases in other charges. Some companies pointed out that if operators recovered only 50 per cent of the loss in termination charges revenue, this would be inconsistent with maintaining profitability, given that most of them were scarcely earning a return to cover their cost of capital. Something near a full waterbed effect would be necessary for these companies to maintain profitability. However, the fuller the waterbed effect, the greater the increases in other charges as termination charges are reduced, which considerably reduces the welfare gain from lowering termination charges.²⁵

f) the contrast with other price controls

It is not the purpose of this paper to take a view on the precise level of the waterbed effect, or on the likely effects of reducing termination charges and the plausible value to be attached to the resulting benefits and detriments. I understand that most of Oftel's work, and work done for it by Jeffrey Rohlfs, in fact assumes that a full waterbed effect applies. However, Oftel points out that the welfare gains in its analysis are primarily driven, not by the level of the waterbed effect, or the overall price level, but by the 'dead-weight loss' from the excessive termination charges plus the further 'dead-weight loss' from the use of excess profits to fund below-cost retail services.

Oftel's approach, which the Commission adopted, thus focuses on what economists call 'allocative efficiency': an improved allocation of resources. It is worth emphasising that the logic of this approach demands that detailed welfare calculations be done, no matter how reliable or otherwise they can ever hope to be. Moreover, the use of allocative efficiency as the benchmark means that the net benefits are always likely to be small. In this respect the price controls on mobile termination charges stand in contrast to price controls on other utility networks.

To explain, the RPI-X price controls on gas, electricity and water networks serve two main functions: they protect customers from excessive prices and they stimulate the companies to greater efficiency.

²⁵ I understand that most of Oftel's work, and work done for it by Jeffrey Rohlfs, assumes that a full waterbed effect applies. However, Oftel points out that the welfare gains in its analysis are primarily driven, not by the level of the waterbed effect, or the overall price level, but by the dead-weight loss from the excessive termination charges plus the further deadweight loss from the use of excess profits to fund below-cost retail services.

The first function has in practice led to significant redistributions of income from producers to consumers, in all three sectors mentioned. However, the logic of the economic analysis underlying the determination of mobile termination rates – in simple terms the waterbed effect – means that the control on mobile termination charges does not serve this function. As noted earlier, it may serve to redistribute income between different types of consumers, but not between consumers and producers.

The second function of utility price controls has also been remarkably effective elsewhere. Operating costs in particular have reduced spectacularly in gas and electricity, and to a substantial extent in water too. No doubt this reflected the higher costs that accumulated over many years of operation in the nationalised sector of the economy. However, this function too is inapplicable to mobile termination charges: the mobile networks were not built and have never operated in the nationalised sector, and it has not been argued that a purpose of the control has been to improve the efficiency of the mobile operators.

In contrast, the justification for a price control on mobile termination charges depends essentially on promoting allocative efficiency. This benefit – the so-called welfare triangle or dead-weight loss - is likely to be an order of magnitude smaller than the gains from reducing prices or costs. (It reflects the product of two relatively small magnitudes: a change in price or cost times a change in output rather than times output itself.) It also requires calculating not only the costs and benefits of the present allocation of resources, but also predicting what the alternative allocation of resources would be and what the costs and values of the resulting outputs would be. As indicated, this is by no means a straightforward task, and for the most part not one that regulators of other utility sectors have taken on board.

3. Oftel and the Commission on the “Receiving Party Pays” principle

a) the advantages of RPP

Present arrangements in the UK are based on the “calling party pays” principle, or CPP. In some other countries the “receiving party pays” principle, or RPP, obtains, notably in the US and Canada where it is known as “mobile party pays” or MPP.

The Commission “considered whether a system of RPP whereby the billing systems of the MNOs [Mobile Network Operators] would be modified so that called parties paid for the termination leg (but not the outbound leg) of an inbound call might represent an alternative to the regulation of termination charges for remedying the adverse public interest effects that we had identified.” (here and below quotations from CC pp. 113-4)

The Commission at first seemed very sympathetic to this approach.

Such a system could be expected to bring about a greater concern on the part of mobile customers about call termination charges and encourage competition between the MNOs in the setting of termination charges in order to gain customers. An additional incentive to the MNOs to keep termination charges low would be the desirability of encouraging customers to keep their mobiles switched on, so that the MNOs would not lose termination business.

Oftel, too, was apparently sympathetic.

The DGT [Director General of Telecommunications] told us that he accepted that a system of RPP was likely to remove the competition problems associated with CPP, by increasing competitive pressures on prices for inbound calls.

In its separate paper on this matter, Oftel went further: RPP “would probably remove the need for further regulatory intervention”.²⁶

BT too endorsed this view.

BT considered that RPP would, if it could be introduced, make call termination charge control unnecessary, since it would remedy the underlying cause – CPP – of the problem.

This is a quite remarkable support for RPP. By these accounts it constitutes a solution to the problem of market power and competition, and makes continued price control of termination charges unnecessary. What then are the objections to it that are so serious as to render it less suitable than price control?

b) the disadvantages of RPP

²⁶ Receiving Party Pays compared to Calling Party Pays, Oftel, 19 April 2002 (paper prepared for the CC and available on Oftel’s website). (Henceforth Oftel RPP 2002)

According to Oftel, “the benefits of RPP were likely to be outweighed by adverse effects on economic efficiency, and also in terms of consumer resistance, and the initial costs of implementation. The DGT’s view, therefore, was that the case for the introduction of RPP in the UK was weak.” BT “accepted that RPP might be costly to implement and might lead to mobile phone users turning off their phones to avoid paying for unwanted incoming calls.”

The mobile operators and some third parties also objected. O₂ said that people would turn off their phones. Vodafone said there would be sub-optimal usage of mobile services contrary to the objectives of section 3 of the Act. Orange said that RPP would have distorting effects and would be disruptive for customers and MNOs. T-mobile also said that compulsory RPP would be disruptive but asked the Commission to recommend optional RPP packages (which T-Mobile itself already offered). The International Telecommunications Users Group (INTUG) said that RPP would be disruptive, confusing and expensive. The Consumers Association (CA) said that “the benefits of RPP had to be balanced against the evidence from other markets, such as the USA, where RPP had constrained market growth through encouraging customers not to keep their phones on, severely undermining the network benefits offered by all MNOs”. The NCC said that RPP would be disruptive to customers and operators.

In sum, there were four main objections to RPP. First, it would be economically inefficient, in terms of the allocation of resources, including the concern that it would lead to distortions and sub-optimal usage. Second, it would be disruptive for the mobile operators and costly to implement. Third, it would be disruptive to customers and therefore meet with consumer resistance. Fourth, it would or might lead to subscribers turning off their mobile phones.

What view did the Commission take of these proposed detriments? First, the Commission did not make any explicit reference to efficiency considerations: in particular, it did not endorse Oftel’s concern about adverse effects on economic efficiency. Second, the Commission was not convinced that cost and disruption to the operators was an obstacle: “The evidence we received suggested that the MNOs might be able to change their systems to RPP at reasonable cost.”

The Commission's sole concern was the effect of RPP on customers and their usage (or lack of usage) of mobile phones:

a mandatory system of RPP would entail too many significant disadvantages for consumers for us to recommend it as an appropriate and proportionate remedy for the adverse public interest effects that we have identified, not least because it might lead to significant numbers of users switching off their mobile phones.

However, apart from the possibility that RPP "might [not "would"] lead to significant numbers of consumers switching off their mobile phones", the nature of these "too many significant disadvantages for consumers" remained unexplained. Oftel's assessment of what it called 'consumer resistance' may provide some insight.

In Oftel's view, existing mobile users would react strongly against having to pay to receive calls. Oftel would have a hard job explaining that overall it was in their interests to pay for such calls when previously they received them for free. Oftel believes that MNOs would also be likely to criticise the changes, lobby against them, and blame the CC and Oftel for their introduction. The political outfall would be considerable.²⁷

4. CPP, RPP and the efficient pattern of calling

Although the Commission did not take up or endorse Oftel's analysis of the effects of CPP and RPP on economic efficiency, this item took up most of Oftel's brief note to the Commission on RPP versus CPP. Moreover, economic efficiency is the basis on which Oftel and the Commission have justified their policy. It is therefore worth examining whether more weight should have been attached to this economic efficiency analysis.

Oftel analyses the relative merits and disadvantages of CPP and RPP in terms of the efficient pattern of calling. Assume that efficiency is defined in terms of calls being made for which the sum of the (expected) value to the caller and receiver exceeds the sum of the costs of originating and terminating the call. Assume that prices charged reflect cost. Assume further that the receiver can identify the caller without significant cost (e.g. from a caller display system).

²⁷ Oftel, RPP 2002, para 12, p. 4

Under both CPP and RPP all calls that are actually made and completed are “efficient” (in the sense that the total value to the parties exceeds the total cost). Moreover, no “inefficient” calls will be made (they may be started but the recipient will not accept them). However, in both systems some calls that would be “efficient” will not be made. The difference between the two systems lies simply in the nature of the “efficient” calls that are not made.

With RPP, there will be some “efficient” calls that are not made (more precisely, not completed) because the value to the receiver is less than the cost of termination, even though the value to the caller exceeds the total cost of calling plus receiving. With CPP these calls would be made because there is no charge for receiving calls. In respect of these calls, CPP is more efficient than RPP.

However, with CPP there will also be some “efficient” calls that are not made (more precisely, not initiated) because the value to the caller is less than the aggregate cost of the call (even though it exceeds the cost of origination) but where the value to the receiver exceeds the cost of termination. With RPP these calls would be made because the caller would be charged less than under CPP and the receiver would be willing and able to pay the extra cost of the call. In respect of these calls, RPP is more efficient than CPP.

The analysis is complicated by questions such as whether the recipient knows the identity of the caller, and can make an informed estimate of the value of receiving the call. Oftel points out that, with RPP, the receiver might accept some calls that in retrospect do not have the expected value, and might also reject some calls that (with more information) would have been valued more highly. But it is also the case that with CPP the caller might (in retrospect or with more information) have made more, fewer or different calls.

Without further evidence, neither system can be said to be unambiguously better than the other. Put crudely, RPP may be problematic where the caller values the call highly but the receiver does not. But CPP may be problematic where the caller does not value the call highly but the receiver does. Oftel effectively recognises this, and provides no argument or evidence to suggest that the set of potential problems and inefficiencies associated with RPP is greater than the set associated with CPP.

It has been argued elsewhere that “when both parties benefit from a call, they should bear its costs in proportion to the benefit they receive. Therefore, imposing all of the costs of an internetwork call on the calling party’s network can be inefficient”²⁸ It is also arguable that some of these problems, where of particular concern, could be overcome by arrangements between subscribers.²⁹

One further empirical consideration is very relevant here. The analysis has hitherto assumed that charges for originating and terminating calls reflect costs regardless of which system of charging is adopted. But in practice this is not the case. There is abundant evidence from all around the world that CPP leads to termination charges substantially in excess of cost – hence the concern on the part of regulators in almost all CPP systems to introduce price controls to reduce such charges. In contrast, as we shall see, there is evidence from other countries that RPP does not lead to termination charges in excess of cost, and in some countries the termination charges may be negligible or zero.

This means that, in practice, the number and value of “efficient” calls that are deterred by CPP are likely to be significant, whereas the number and value of “efficient” calls that are deterred by RPP are likely to be negligible. In terms of this aspect of economic efficiency, RPP is almost certainly superior to CPP.

5. Switching off mobile phones

a) the perception

²⁸ DeGraba 2003, abstract.

²⁹ For example, it is possible in the US for one subscriber to pay the costs incurred by other nominated subscribers (e.g. dependents) in receiving calls. Oftel recognises the possibility of internalisation, and asserts that “it is probable that CPP facilitates the internalisation of a greater proportion of call externalities than RPP”. The only basis for this is the suggestion that “the problem of mobile customers not publicising their number is likely to be smaller”. But since mobile customers would have an incentive to ensure that those whom they wished to call them would know their number, it is not clear that this problem is of much practical significance, particularly if (as in RPP countries today) the termination charge is low or zero. Crandall and Sidak 2004 discuss at some length the practical scope for internalising externalities. Jeon et al 2001 provide a more formal mathematical analysis and discuss some earlier references.

The Commission rejected RPP because “RPP would entail too many significant disadvantages for consumers .. not least because it might lead to significant numbers of users switching off their mobile phones”. What is the evidence for this switching off?

Three witnesses – O₂, BT and CA – are reported as making the claim. Oftel’s paper referred to “some users turning off their handsets (as in the USA)”. To substantiate this it provided the statistic that “in USA 20% of mobile customers never switch their phones on except to make a call”.³⁰ However, none of these parties is reported as providing any further evidence for the claim.³¹ Nor did the Commission itself cite any evidence.

Elsewhere, other commentators reflect or report a similar perception. For example

Some have argued that under an MPP system, a mobile subscriber has an incentive to switch off his mobile phone when not placing calls, so as to avoid being charged for incoming calls.³²

Experience from receiving party pays (RPP) regimes, e.g. in the United States, indicate that consumers are wary of switching their mobile phones on or using them at all when they fear overspending.³³

Proponents of the CPP system argue that RPP discourages mobile use. Subscribers in RPP countries are much more likely to turn their phone off, or refuse to answer calls, in order to avoid paying for them.³⁴

But again, none of the commentators give any evidence to support this.³⁵

b) evidence?

³⁰ Oftel RPP 2002, para 5 and Table and footnote accompanying para 3.

³¹ I understand that Oftel attributes the 20% statistic to evidence provided to the CC by the industry. I have not seen this evidence.

³² Crandall and Sidak 2004 p.16.

³³ Feldmann 2003, p. 6

³⁴ Rohan Samarajiva and William H Melody, Briefing Paper, Fixed-Mobile Interconnection Workshop, ITU New Initiatives Program, Geneva, 20-22 September 2000.

³⁵ Crandall and Sidak 2004 reference Hausman 2002 p. 595. However, Hausman does not make this specific claim. He simply comments that “As a consequence [of RPP] many US mobile customers do not give out their mobile number”, before noting that this effect is now decreasing. The Crandall and Sidak footnote seems to refer to their following sentence, which makes the same point as Hausmann.

In 2002 the ITU held a Workshop on mobile interconnection, which might be expected to provide some evidence.³⁶ The case study of India, where the courts blocked the proposed change from RPP to CPP, does not mention mobile phones being switched off.³⁷ The case study on Mexico, which did change to RPP, observes that there was an increased degree of congestion, and notes as a possible explanatory factor that “under the CPP system the majority of the mobile users do not disconnect their telephones as used to be the case when called party pays was the ruling system”.³⁸

The ITU case study on China and Hong Kong, both of which still have RPP, records some phones on “stand-by” in China.

Due to this RPP regime, carrying both a mobile phone handset and a radio pager simultaneously has become a common phenomenon in many places across China. The mobile phone is mainly used to originate calls while the pager is used to help the subscriber decide whether or not a prompt reply is needed. The mobile phone remains in stand-by most of the time. In this way the subscriber can save some money by avoiding receiving and paying for unimportant calls. However, this has frustrated the usage behaviour of subscribers as their convenience is sacrificed. As a result there has been a strong demand for the introduction of CPP regime in China.³⁹

However, “the regulator was very reluctant to move to a CPP regime”.⁴⁰

³⁶ See Samarajiva and Melody above, and Samarajiva 2001.

³⁷ “Fixed-Mobile Interconnection: The case of India”, Lara Srivastava and Sidhartha Sinha, Fixed-Mobile Interconnection Workshop, ITU New Initiatives Program, Geneva, 20-22 September 2000. See also Srinavasta and Sinha 2001.

³⁸ “Fixed-Mobile Interconnection: The case of Mexico”, Arturo Briceno, Fixed-Mobile Interconnection Workshop, ITU New Initiatives Program, Geneva, 20-22 September 2000, p. 25. The paper notes the increased number of calls after the move to CPP (despite the increased call prices). It offers as a “possible explanation” (advanced by a colleague) that “Before CPP, a mobile subscriber used to keep off his mobile at certain times to avoid receiving unwanted calls that had to be paid by him for receiving the call”, thereby creating a degree of ‘repressed traffic’, whereas after CPP there is no need to do so. See also Zehle 2003.

³⁹ Fixed-Mobile Interconnection: The case of China and Hong Kong SAR, Xu Yan, Fixed-Mobile Interconnection Workshop, ITU New Initiatives Program, Geneva, 20-22 September 2000, p. 10.

⁴⁰ “The major concern behind the regulator’s reluctance to change is that a transition to CPP might lead to the immediate shrinkage of the paging branch of China Unicom, in which the Chinese government had invested heavily in past years. [“the state-owned new entrant China Unicom operated the largest radio paging service in the country”].

In contrast, although the RPP policy applies in Hong Kong too, the reaction there is quite different: “Due to relatively low tariffs resulting from competition and relatively high per capita incomes, neither the regulator nor the operators have been subjected to the pressure [for] moving to a CPP regime.”⁴¹

One final report comes from St Kitts & Nevis: “Our customers were extremely pleased with the introduction of CPP. Before CPP many customers kept their phones switched off, but now everyone keeps their phone on.”⁴²

There are thus several reports of mobile phones being switched off to avoid paying termination charges, at least in certain parts of the world where the mobile networks were then little developed. But there seems to be no quantitative evidence anywhere on what proportion of mobile subscribers are claimed to have switched off their phones, nor on what proportion of the time these phones are off. Whether these proportions are about 10% or 90% or somewhere in between is unknown. Nor are there comparable figures for CPP networks, which is relevant since subscribers switch off mobile phones even there, in order to avoid being disturbed at inconvenient times or simply to avoid running down the battery, and it is presumably the difference between the proportions for the CPP and RPP systems that is of concern. This lack of quantification is a rather unsatisfactory basis for serious policymaking (which an RPI-15 price cap surely is).⁴³

c) other evidence

Moreover, it was feared that the introduction of CPP would increase the overhead budget of governmental departments and state-owned enterprises still dominating the Chinese economy.”

⁴¹ Id p. 12

⁴² Mobile Marketing, Cable & Wireless, St Kitts & Nevis, cited in Zehle 2003, p. 10.

⁴³ Whether more mobile phones being switched off is an unambiguous detriment also seems worth a little consideration. If switching off prevents the receiver from unwanted disruption, or receiving (and paying for) an unwanted call, then it represents a benefit. There must also be many people who would welcome a reduction in the number of mobile phones switched on, particularly in trains, restaurants, shops and public places. Some provision is beginning to be made for this in public places, but the welfare analyses do not seem to consider this factor.

It might be argued that the precise extent of switching off mobile phones is not very relevant. The main issue is whether CPP leads to limiting of inbound calls, whether by switching off or by other methods such as using calling line identification (CLI) devices to decide whether or not to accept a call, not distributing the telephone number widely, or indeed changing the telephone number.⁴⁴

There seems to be clearer evidence that a change from RPP to CPP can increase the number of inbound calls. For example, after Mexico switched from RPP to CPP on 16 April 1999, “there was a significant increase incoming mobile traffic (+ 28.7 per cent), despite the fact that the effective fixed-to-mobile tariff went up from US\$0.115 to US\$0.403 per minute (i.e. 250 per cent).”⁴⁵ An increase in traffic after such a change in system is said to be true more generally.

All evidence available to me suggests that when a change from RPP to CPP is made inbound and outbound call volumes increase substantially. This suggests that RPP system substantially inhibits inbound call volumes and also outbound call volumes.⁴⁶

A study of the countries that have changed from RPP to CPP systems is in no doubt about the significant impact that the change has had.

The introduction of CPP in Central and South America and the Caribbean between 1995 and 2002 more or less showed the same pattern [as in Pakistan and Mexico].

- CPP was a contributing factor in accelerating the growth in mobile subscribers.
- Average monthly mobile terminated minutes per customer increased.
- The introduction of CPP lead to an increase in gross margins for fixed and mobile operators.⁴⁷

⁴⁴ “In India while RPP was still in effect, mobile phone users were interviewed as to reason for churning (i.e. terminating one number and taking out a new one). It emerged that an important reason was that the number got known too widely.” Stefan Zehle, personal communication, 30 October 2003.

⁴⁵ Samarajiva and Melody, 2000, Box 1, p. 4. Attributed source Mexico Case Study. An associated Figure shows that incoming mobile traffic increased from 73 to 94 minutes of use per subscriber, while outgoing mobile traffic reduced from 89 to 83 minutes per subscriber.

⁴⁶ Stefan Zehle, personal communication, 24 October 2003.

⁴⁷ Zehle 2003, p. 10.

For policymakers in Europe it is relevant to ask how these various magnitudes relate to the level of termination charges and the level of (national and personal) income. How far is the experience of a developing country indicative of what would happen in a more developed one? Arguably experience in North America might be more relevant in considering the possible effect of a RPP policy in the UK and Europe generally. It is therefore particularly important to consider experience of RPP in the USA.

6. US experience

a) switching off in the early days

It has been argued that RPP in the US reduced the number of incoming calls.

Typically in the USA with wireless party pays tariffing inbound call minutes account for 26%-30% of total call minutes. In calling party pays environments traffic is initially 40% inbound, but as numbers are circulated widely in some networks inbound minutes account for nearly 50% of internetwork traffic.⁴⁸

A market trial by one US operator suggested that switching from RPP to CPP would lead to more inbound calls.

In 1994 AT&T Wireless conducted extensive calling party pays market trials. These trials showed that over time inbound calls minutes for customers who converted to CPP increased from 26% of total minutes to 32% within approximately half a year. Over time the increase is likely to be substantially higher.⁴⁹

Anecdotal evidence also suggests that switching off may indeed have occurred in the early days of US mobile telephony.⁵⁰ Withholding of

⁴⁸ Stefan Zehle, Coleago Consulting Ltd, "Customer Acceptance of CPP and Effect on Market Growth", IIR Calling Party Pays Conference, San Francisco, USA, March 1998, p.10.

⁴⁹ Id. p. 11

⁵⁰ E.g. "On the claim that mobile phone users under MPP tend to have their handsets off and withhold their phone numbers, certainly this was true in my experience in the first 3-4 years of usage in the US." Eric Ralph, personal communication, 13 October 2003.

telephone numbers is also reported there, this time with an element of quantification.⁵¹

b) the situation now

However, most of this evidence is from the mid-1990s, which were the early days of US mobiles. US conditions have changed considerably since then, not least because mobile operators have taken steps to reduce or eliminate the financial obstacles to making and receiving mobile calls. These steps include providing “buckets” of free minutes that may apply to incoming as well as outgoing calls, making the first minute of any incoming call free to the receiver, providing free caller ID, and reducing the charge for receiving calls.⁵²

Oftel concurs. After its remark about 20% of US phones turned off, it adds the footnote “The trend may have changed recently, as US MNOs have recently introduced packages with generous quantities of bundled free minutes covering both inbound and outbound calls.” Other commentators too agree that the US situation is now different.⁵³

The FCC has recently dealt explicitly with this issue, since at one time there was a possibility of the US changing to CPP.

⁵¹ “... customer research carried out by Bell Atlantic (2001) ... found that personal users in the US had relatively limited distribution of their mobile number under RPP. The main reason cited (by 33% of personal users who did not distribute their number) was that it costs them to receive calls.” *Modelling the UK mobile market: The potential impact of a switch to receiving party pays*. A report prepared for Vodafone, Frontier Economics, London, October 2002. Annex 3 p. A 28. (This is an unpublished report, hereafter cited as *Frontier Modelling*.) The Bell Atlantic study is not further referenced there.

⁵² The correspondent in the previous footnote continues “This was, as I remember it, one of the explicit reasons for the first free incoming minute, and also for caller ID being standard (that is, free) on these phones (making it possible for the paying mobile subscriber to screen calls). ... Calls were much more expensive then. ... the buckets were much smaller and the fixed fees and out-of-bucket per minute prices much higher than they are now. I certainly was personally concerned about receiving calls then, whereas today I care only marginally. This may be in small part due to habituation, but price has played a very important role.”

⁵³ E.g. “... it is often argued that subscribers withhold disclosure of their numbers to deter unwanted incoming calls. However, with digital systems, caller line identification (CLI) and tariffs which permit the first minute of an incoming call to be free, such as practised by Sprint PCS, help to prevent this.” Doyle and Smith 1998, p. 482. See also Hausman 2002; Crandall and Sidak 2004.

In theory, MPP [RPP] creates an incentive for wireless subscribers to switch off their mobile phones when not placing calls to avoid being charged for incoming calls, and for the same reason it also discourages them from giving out their mobile phone number. In contrast, CPP theoretically has the potential to stimulate mobile usage by increasing the accessibility of mobile subscribers to incoming calls, and also by allowing mobile subscribers to devote their entire wireless budget to outgoing calls.

In practice, U.S. mobile operators have managed to counter the potentially adverse incentive effects of MPP [RPP] by introducing bucket plans to stimulate usage.⁵⁴ As noted above, progressive increases in the size of mobile buckets have been a major driver of average mobile usage in the United States. Bucket plans may increase the accessibility of mobile subscribers to their friends and family in an environment in which they pay for both incoming and outgoing calls.⁵⁵ At the same time, high mobile termination rates in Europe and other CPP environments may discourage people from calling mobile subscribers by increasing the cost of placing calls to mobile phones.⁵⁶

c) comparison of termination charges and prices

The comparison between US and European termination charges is quite striking.⁵⁷ In 1999 the fixed-to-mobile interconnection rates in 13 European countries, all using CPP, ranged from \$0.156/minute to \$0.300/minute with a mean of \$0.206, median \$0.200. (The UK rate was \$0.160.) In the US the rate was \$0.020 – a tenfold difference - and in Canada the rate was zero.

⁵⁴ “*Nextgen VII* at 28 [Linda Mutschler et al, *The Next Generation VII*, Merrill Lynch Equity Research, 21 February 2003]. We note that at least one U.S. carrier has begun offering plans with free incoming minutes. See Nextel, Nextel Free Incoming Plans (visited June 3, 2003) http://www.Nextel.com/phones_plans/promos/promo_free_incoming.shtml” (footnote in original)

⁵⁵ Id. (footnote in original)

⁵⁶ *8th Mobile Report*, paras 212-213

⁵⁷ The following data are from Samarajiva and Melody 2000, Figs 5, 6 pp. 11-13. Their source is given as ITU 2000 Regulatory Survey. Feldmann 2003 reprints their Figure 6 as Fig 9, p. 25.

A similar contrast between RPP and CPP systems applied elsewhere in the world.⁵⁸ The difference in overall average between RPP and CPP systems was of the order of 20-fold.⁵⁹

Rates have since come down: in 2003 the FCC cited an average of just over \$0.16 for Europe versus \$0.005 for US.⁶⁰ However, the contrast between the systems is even stronger: the difference is now 30-fold.⁶¹ In fact, for RPP countries generally the termination charge is negligible or zero.

Of course, termination rates are only part of the cost of making a call, but even taking other costs into account the difference between the two types of system remains. For 8 CPP countries the average revenue per minute in early 2003 ranged from \$0.10 to \$0.30 with a median of \$0.21 (UK \$0.22), whereas in the US the average revenue was \$0.12 and in Canada \$0.11. The average cost per call-minute in UK and Europe is thus about double the average cost in US and Canada.⁶²

d) comparison of subscriber penetration and usage

At one time, it was not obvious whether RPP or CPP had a significant effect on subscriber penetration.

Analysing wireless mobile telephony market penetration growth in the different European countries and the USA does not suggest that calling party pays leads to faster market growth. At the end of June 1997, wireless penetration in the USA had reached 19%, compared to 11% in Europe. Penetration rates in Europe varied widely from 6.5%

⁵⁸ For 9 selected non-European countries, all using CPP, the corresponding range was from \$0.017/minute to \$0.293/minute with a mean of \$0.128 (median \$0.078). For 4 Asian countries using RPP (China, Hong Kong, Singapore and Sri Lanka) the range was zero to \$0.008 with a mean of \$0.002 (median \$0.0006).

⁵⁹ The average over all countries responding to the ITU survey is given as \$0.105 for CPP versus \$0.005 for RPP. Petrazzini has \$0.092 versus \$0.005. This seems to be the source for 9.20 US cents versus 0.05 US cents in Oftel (2002); the last figure should presumably have been 0.50 cents.

⁶⁰ *8th Mobile Report*, citing Mutschler, *Nextgen VII*.

⁶¹ Crandall and Sidak 2004 point out that account needs to be taken of origination charges also, which for one US operator amount to \$0.09/minute. Even so (and without including origination charges in Europe) the difference in total price is nearly two-fold.

⁶² Crandall and Sidak 2004, Table 2, p. 17, citing Mutschler, *NextGen VII* and other research.

in Belgium to 34.5% in Finland. Penetration in Finland at the end of 1997 reached 41.9%. The WPP [RPP] market with the highest penetration in the world is Hong Kong, where at the end of June 1997 penetration reached 24.4%.

Currently there is no quantifiable correlation between penetration and whether CPP or wireless party pays (WPP) [RPP] tariffing is applied. Other factors such as incomes, tariff levels, competition, promotion and cultural factors impact significantly more on differences in penetration. However, in the longer term CPP is likely to lead to more rapid market growth and higher penetration levels.⁶³

The author of that passage has recently reaffirmed the second paragraph cited, adding that “While MPP certainly has held back growth in the US and Canada, some countries such as Hong Kong and Singapore have achieved very high penetration rates without moving to CPP.”⁶⁴ To illustrate this latter point, mobile penetration rates in 2000 showed the US 40% and Canada 28.5%, compared to EU area 62.5% and UK 67%, but Singapore 68.3% and Hong Kong 80.1%.⁶⁵

Penetration rates have since increased generally. In late 2002 or early 2003 the penetration rates were 37% for Canada and 49% (or 43%?) for the US. For the 8 CPP countries mentioned above, the penetration ratio ranged from 62% to 93% of the population, with a median of 70% (UK 85%).⁶⁶

Not surprisingly, however, lower call prices in RPP countries induce a higher average calling rate. In the 8 CPP countries the range is 72 to 296 minutes of use per subscriber per month, with a median of 158 minutes (UK

⁶³ Zehle, 1998. Note: Samarajiva and Melody 2000, Box 4, p. 10 explain that Finland is an exceptional system in that it uses CPP but in most cases termination rates are not used there.

⁶⁴ Zehle 2003, p. 11

⁶⁵ Frontier, Modelling, Annex 3, Table A1, p. A 22. Source given as OECD, Working Party on Telecommunications and Information Services Policies – Cellular Mobile Pricing Structures and Trends, Directorate for Science, Technology and Industry, Committee for Information, Computer and Communications Policy, 2000.

⁶⁶ Crandall and Sidak 2004, Table 2, p. 17. There seems to be a discrepancy between the US figure of 49% in the table and the figure of 43% at the top of the range. The table does not give figures for Singapore and Hong Kong.

132 minutes). In contrast, in Canada the average usage is 270 minutes and in the US 458 minutes.

Several other factors besides CPP and RPP are presumably at work here. Higher penetration rates may attract subscribers who make fewer calls. In addition, over the last few years there has been a strong drive to attract pre-payment customers, particularly in the UK.⁶⁷ They account for 69% of all UK subscribers, in contrast with 5% of US subscribers.⁶⁸ They are also said to have lower average usage rates. Whether this is independent of the type of system is debateable: the attractiveness of prepaid subscriptions is likely to have been enhanced by the high termination charges characteristic of the CPP system, and perhaps by the greater controllability of expenditure under that system.⁶⁹ There are also suggestions that the CPP penetration rates may be overstated because they do not always correct for handsets no longer in use.⁷⁰

Whether CPP is likely to lead to higher penetration levels indefinitely is not clear. Penetration has been growing in all countries, but presumably there comes a limit when everyone has a mobile phone. The extent of mobile usage in the US and Canada is still remarkably low in some respects, particularly international calls.⁷¹ But it has been argued that the penetration rate itself has been growing in the US until 2002, that penetration has been

⁶⁷ “One of the most commonly cited factors contributing to subscribership growth has been the emergence of pre-paid mobile services, which facilitate access to individuals unable to acquire fixed lines due to insufficient credit history.” *Telegeography 2002*, p. 78. The ability to budget via prepayments has also been an added attraction of prepaid services in the UK energy sector, and may well be of greater importance in European telecoms sectors where local calls are not free as in the US.

⁶⁸ Crandall and Sidak 2004, Table 2, p. 17.

⁶⁹ *Frontier Modelling* p. A 25

⁷⁰ “...it has been argued by the FCC that with pre-paid subscribers, there is a greater potential for miscalculating the number of ‘active’ subscriptions; higher churn among pre-paid customers coupled with delays on the part of mobile operators in up-dating their customers records means that new subscribers recorded each year may in fact be switchers and not genuine increases in penetration. The implication is that increases in subscriptions and penetration in Western Europe may be slightly overstated.” *Frontier Modelling*, Annex 3, p. A 25.

⁷¹ In 2002, the percentage of international traffic originated from mobiles in Africa, Latin America & Caribbean, Europe and Asia & Pacific ranged from about 17% to about 24%, compared to about 4% in US & Canada. For incoming traffic the corresponding ranges were about 24% to about 32% compared to about 5%. *Telegeography 2004*, Figures 2 & 3, pp. 44,45.

increasing rapidly in the US and Canada, and in both countries is likely to equal the penetration rates of CPP countries in the near term.⁷²

7. Conclusions

There has been widespread and increasing concern, throughout much of the world, at the level of mobile termination charges. To deal with this, increasingly severe price controls have been put in place or are in prospect.

Oftel and the Competition Commission identified the Caller Pays Principle (CPP) as the source of the market power that enabled mobile operators to set termination charges above cost. They also recognised, as economists have argued, that this in turn provides the incentive to attract new subscribers onto the system by offering subsidised handsets and lower subscription charges. This means that competition between mobile operators can reduce or remove monopoly profits despite the high termination charges.

Both Oftel and the Commission accepted that the alternative Receiver Pays Principle (RPP) would be a solution to the monopoly problem. RPP would encourage competition and encourage operators to keep mobile charges down. This paper has shown that evidence from countries where RPP is in effect, particularly the US, is fully consistent with this view.

Oftel and the Commission nonetheless rejected RPP, and instead proposed more severe price controls. The Commission did not endorse Oftel's argument that RPP could lead to an economically inefficient pattern of calling (in terms of whether the aggregate value of a call exceeded the aggregate cost). The analysis in this paper has shown that there is no reason to expect that RPP is less efficient than CPP in this respect. Indeed, since CPP leads in practice to termination charges significantly in excess of cost this means that CPP is almost certainly a less economically efficient system than RPP.

Nor did the Commission accept that a change to RPP would be unduly disruptive or costly to mobile operators. No doubt there would be transitional costs. But the evidence that the Commission received suggested that operators might be able to change their systems to RPP at reasonable

⁷² Crandall and Sidak 2004, p. 18. They project that US penetration should equal penetration in most CPP countries between 2008 and 2014.

cost. This is not to say that the mobile operators would welcome it. If Oftel and the Commission are right that the CPP system as presently operates facilitates a transfer of income from fixed to mobile systems, and if retail competition does not eliminate this transfer entirely, then some operators might prefer CPP, provided the controls on termination charges were not too severe.

The sole reason for the Commission's decision was that RPP would entail too many significant disadvantages for consumers, not least because it might lead to significant numbers of users switching off their mobile phones. This argument is difficult to endorse. No significant evidence was adduced to support the proposition that users would turn off their phones. Others have claimed that this happened, typically in countries at an early stage of mobile development, but there seems to be no measure of this.

There is evidence that in earlier times and in systems at an early stage of development, RPP did reduce the level of usage, whether by encouraging subscribers to switch off phones, make phone numbers less available, not accept calls, and so on. In Mexico and other countries, mainly in South America and Asia, the volume of calls as well as number of subscribers increased after a change from RPP to CPP. The number of subscribers is also lower in the US and Canada, where RPP obtains, but much higher in Hong Kong and Singapore.

The view of the FCC and others is that in practice any reduction of usage no longer applies in the US today. Mobile operators have countered any such adverse incentive in a variety of ways, not least by offering low-priced or free incoming minutes. Indeed, the average termination charge now seems to be negligible or even zero in all the RPP countries, in contrast with an average charge of over 16 cents per minute in Europe. In the light of experience in RPP countries generally, it is no longer tenable (if indeed it ever was) to argue that a change from CPP to RPP would lead to a significant number of users switching off their mobile phones, at least in the UK.

Would RPP have other significant disadvantages for customers? There could well be an increase in the subscription charge and a reduction or removal of the subsidy on handsets. It is possible that this could lead to a reduction in the penetration rate, which is roughly twice as high in Europe as in the US at present. Some consumers ("those who make more lower price calls or

mainly receive calls or who make little use of their mobile phones”) would no longer be unfairly subsidised, as the Commission put it. But any reduction in penetration, if at all, is not likely to be great.⁷³ It is also likely to be only temporary, since the penetration rate is increasing rapidly in the US, and one might expect that the European penetration rate would eventually resume its level and pattern of increase over time.

Customers might object to the principle of paying to receive calls. But this is essentially a matter of custom. In the US and other RPP countries it is an accepted practice. In fact, consumer groups there opposed a change to CPP.⁷⁴ Moreover, the levels of termination charges in modern RPP systems are negligible and do not represent a barrier to usage.

Indeed, RPP would have a major benefit to customers in that significantly lower call charges can be expected to enable significantly higher levels of usage per customer: in the US and Canada average usage is some two to three times the average levels in the UK and Europe. Partly this is likely to be the consequence of a lower penetration rate, but not entirely.

As to whether the outcome of the RPP system is to be preferred to that of the CPP system, the logic of the position taken by Oftel and the Commission is essentially Yes. Their stated aim is an efficient allocation of resources, undistorted by excessive termination charges and subsidised handsets, and their preference is to achieve this aim by competition where possible. Their aim, in short, is to change the outcome from that which is observed in CPP countries around the world, to that which is observed in RPP countries. There is now clear evidence that this aim can be achieved by competition without severe and intrusive price controls, and that consumers in general can expect to benefit.

⁷³ An unpublished study commissioned by Vodafone calculated that RPP would imply a 64% penetration rate for the UK compared to then-existing rates of 70% in the UK and just over 40% in the US. Frontier, *Modelling*, p. 30.

⁷⁴ “In particular, the Texas Office of Public Utility Counsel (OPC), the Consumer Federation of America (CFA) and the Consumer Union (CU) submitted joint comments to the FCC arguing against CPP. The reasons cited included the fact that prices would rise for the calling party and this would reduce accessibility to mobile users ...” Frontier, *Modelling*, p. A32, citing Joint comments of the Texas Office of Public Utility Counsel, Consumer Federation of America and Consumer Union (OPC/CFA/CU) dated September 1999 on FCC Notice of Inquiry, WT Docket No. 97-207.

A switch from CPP to RPP would avert a possible conflict between US and EU regulatory authorities. It is natural to ask whether the same policy recommendation should apply to fixed as well as mobile networks. Many of the same factors apply, although to some extent the costs of access are there recovered in the line rental, and the scope for subsidising handsets has been limited by policy. The goal of regulatory consistency and the possibilities of convergence between mobile and fixed suggest that this issue deserves further investigation.

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