

# **Equi-proportional mark-ups: regulatory precedents**

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Royal Mail**

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## Executive summary

In its April 2005 consultation document on size-based pricing, Postcomm reviews Royal Mail's latest proposals to introduce more cost-reflective tariffs. In the document, an important element of the assessment is the method adopted to allocate those costs not captured in the products' long-run marginal costs (LRMCs).

Postcomm has stated that it believes equi-proportional mark-up (EPMU) to be the most appropriate approach to allocate joint costs and overheads. According to the regulator, this approach has been adopted by other regulators in pricing determinations and has been accepted by the Competition Commission.

However, these regulatory decisions should be analysed against the background and context of previous cases, and, in particular, the specific characteristics of the mobile telephony industry. From the review of these regulatory precedents, this report argues that EPMU would be an acceptable approach if the costs to be recovered through the mark-up were small, and if demand elasticities for the services in question were similar. For the postal services sector, it is the case both that costs to be recovered through the mark-up are significant, and that demand elasticities differ between products. This suggests that an EPMU approach to allocate these costs is in principle less appropriate. Therefore, the regulatory precedents mentioned by Postcomm cannot be seen as providing the necessary and sufficient support to adopt an EPMU approach in the current Royal Mail price control review.

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# 1 Introduction

In its April 2005 consultation document on size-based pricing, Postcomm reviews Royal Mail's latest proposals to introduce more cost-reflective tariffs. In the document, an important element of the assessment is the method adopted to allocate those costs not captured in the products' long-run marginal costs (LRMCs).

According to Postcomm, the equi-proportional mark-up (EPMU):

allocates the joint costs and overheads to a product in the same proportion as that product's share of total LRMC costs (Postcomm 2005a, para 4.5)

and is:

the most appropriate approach to distributing genuine overheads amongst products and customers. (Ibid, para 4.20)

In the June 2005 Initial Proposals document, it is stated that:

Postcomm's approach to cost attribution is to set prices on the basis of the avoidable costs of providing a product, plus a proportionate share of the fixed costs attributable to operational activities used by the product, plus an 'equi-proportional mark up' (EPMU) of joint costs and profit. (Postcomm 2005b, para 6.20)

Alternative cost allocation rules may also be consistent with the European Postal Directive. Indeed, Postcomm appears to have considered alternatives for allocating joint costs and overheads between the different products:

Postcomm recognises that EPMU is not the only possible basis for allocating joint costs and overheads. For example, ... an alternative approach which emphasises efficiency rather than equity is Ramsey pricing. This involves attributing joint costs inversely to the elasticity of demand for products, i.e. on the basis of ability and willingness to pay. Under this approach customers with the most limited range of competitive options, and therefore the lowest elasticity of demand, would pay the largest share of joint costs. The underlying analysis of efficiency supporting Ramsey pricing can be criticised for not reflecting the dynamic effects of competition when assessing efficiency. Postcomm considers that Ramsey pricing, at its most extreme, is very unlikely to be appropriate for a company with a strong monopoly position in the early stages of a developing competitive market. (Postcomm 2005a, para 4.19)

Furthermore, Postcomm appears to suggest that its adoption of EPMU is supported by regulatory practice in other sectors:

Postcomm continues to believe that EPMU is the most appropriate approach to distributing genuine overheads amongst products and customers. EPMU has been adopted by other regulators in pricing determinations (e.g. Ofgem and Ofcom) and accepted by the Competition Commission. (Ibid, para 4.20)

A similar statement is made in Postcomm's Initial Proposals document (2005b, para 3.55), in which the regulator also refers to the use of EPMU to develop its proposed access price in the *draft* access determination for UK Mail (Postcomm 2003).<sup>1</sup> Furthermore, in the Initial

<sup>1</sup> This draft determination was not made into a final determination, following a separate contractual agreement between Royal Mail and UK Mail.

Proposals document, Postcomm refers to EPMU as being an element in its work on establishing a Code of Practice for Common Operational Procedures (2005b, para 6.20).

Postcomm refers to the EPMU approach as being 'established', although it is unclear that this is the case. The regulator is applying EPMU in the postal services sector for decisions on cost allocation, but, as this report shows, the EPMU may not be appropriate for the UK postal services sector.

The report focuses on the regulatory precedents for adopting EPMU instead of alternative pricing rules, including Ramsey pricing, and the context in which regulatory decisions were undertaken. The two regulatory precedents examined are the Competition Commission inquiry into mobile call termination charges, undertaken in 2002 and reported on in 2003, and the 2004 Ofcom review of the wholesale mobile voice call termination markets (reviewed in section 2). The relevance of these regulatory precedents for the UK postal services sector is then considered in section 3.

The report concludes that the context in which the cost allocation approaches were adopted by the Commission and Ofcom, in the case of mobile telephony, is different from that of postal services. These are the two cases that have drawn significantly on the literature on cost allocation approaches.

In principle, EPMU is a reasonable approach where the costs to be recovered are small and/or demand elasticities for the services in question are similar. However, when fixed and common costs are significant, and/or demand elasticities differ between products, as in the case of postal services, an EPMU approach may not be appropriate. Other factors may be appropriate—in particular, where the market conditions are such that the universal service provider (USP) faces an obligation to maintain geographically averaged prices, and to fund it through cross-subsidies (De Donder et al 2005).

## 2 Cost allocation in mobile call termination

### 2.1 The Competition Commission inquiry

The Competition Commission's mobile call termination charges inquiry looked at the treatment of EPMU and Ramsey pricing. The investigation concerned the charges set by the mobile network operators (MNOs) for terminating calls on their respective networks.

Fundamental to the Commission's approach to assessing allowable call termination charges is the 'cost-causation principle'. This means that callers should be allocated the costs that they cause. In the Commission's view:

this approach, which starts from LRIC [long-run incremental cost], is both right and fair, because it attributes costs on the basis of who causes, or benefits from, them. (Competition Commission 2003, para 2.509)

The MNOs, however, stated that the most efficient way to recover fixed and common costs was the Ramsey-based approach. It is noteworthy that the cost allocation in the mobile inquiry referred to fixed and common costs, and not to joint costs. Postcomm's statements refer to the allocation of joint costs and overheads.<sup>2</sup>

The Commission rejected the Ramsey-based approach because it considered this to be inconsistent with the cost-causation principle. In addition, it identified the following three further objections to the Ramsey approach.

- Setting Ramsey-based termination charges would require other relevant prices to be set at Ramsey levels. According to the Commission:

the Ramsey approach is concerned with the relativities between different prices, for example, subscription, origination and termination. In other words, Ramsey pricing is about a structure of pricing. (Competition Commission 2003, para 2.516)

Furthermore, the Commission considered that, as profit-maximising firms, the MNOs would set prices using firm-specific demand elasticities and their relative levels. However, according to the Commission, these would clearly differ from the analogous market elasticities.

- It would be difficult to obtain reliable estimates of the elasticities of demand, as reflected in the lack of consensus regarding the correct values for the different elasticities.
- A regulated price based on Ramsey principles could lead to distributional inequities. In the mobile case, the distributional unfairness would be that:

fixed-to-mobile and off-net callers, whose demand is thought to be relatively price-inelastic, would pay prices for mobile call termination well in excess of the costs which their calling activity causes the MNOs to incur. (Competition Commission 2003, para 2.510)

<sup>2</sup> Joint costs arise in settings in which the production costs of the outputs of two or more products cannot be separated. In other words, they are incurred when production facilities simultaneously produce two or more products in fixed proportions, such that an increase in the output of one product will necessarily mean a corresponding increase in the output of the other product. In contrast to joint costs, common costs can vary to some degree with the quantity of production of each product, even though they are not directly attributable to a single product.

The Commission also considered EPMU as an alternative basis on which to allocate the fixed and common costs of the MNOs, as proposed by Of tel. The Commission stated that:

EPMU is equivalent to the special case of Ramsey pricing when all the super-elasticities<sup>3</sup> of the goods or services in question are equal, since EPMU and Ramsey would then give the same results. Therefore, if the evidence on the elasticities of the various mobile services in this case does not show large differences, the error in using EPMU rather than in choosing Ramsey prices would appear to be small, particularly if, as we believe, fixed and common costs are small. However, we have already concluded that the value of the elasticities cannot be reliably established and we could not, therefore, establish that they were not different from each other. (Competition Commission 2003, para 2.53)

Strictly speaking, the cost-causality approach adopted by the Commission was not EPMU, although it led to similar answers to the EPMU approach favoured by Of tel. In particular, the Commission stated that:

We also note that EPMU is not consistent with our preferred approach (that is, that termination charges should reflect the costs caused by the calling party) and, in this sense, it seems to us to be somewhat arbitrary. We note, however, that in this particular case, the cost-causation principle yields a very similar answer to that which results from the application of Of tel's EPMU proposal. There are two reasons for this: first, [Of tel] has allocated no customer acquisition costs to termination charges, and nor have we; and second, [Of tel] has in effect allocated network fixed and common costs to termination charges using routing factors and we have done so explicitly. (ibid)

Indeed, the determination of the appropriate mark-up was influenced by the Commission's modelling, which was partly based on Of tel's LRIC model. In this model, almost all costs are judged to be incremental, and therefore the proportion of fixed and common costs is small. Common network costs, to be recovered via an EPMU, were around 3–5% of total network costs.

Furthermore, with regard to assessing which non-network costs should be allocated to the costs of call termination, the Commission considered the following criteria:

- is the cost common to two or more services in the long run? If so, on what basis should it be allocated to services?
- if not common, should it be allocated to terminating calls for either of the following reasons: callers to mobiles cause the MNOs to incur the cost; or callers to mobiles benefit from the cost incurred by MNOs? (Competition Commission 2003, para 2.324)

Based on these criteria, the Competition Commission considered that only the administration overhead—of around £130m a year—was a common cost that should be allocated across all areas of the business, including network functions and customer acquisition, retention and service functions. Only around 32% of this amount was allocated to the network (ie, around £40m) and recovered through an EPMU.

A central question in the discussion on the distributional effects of the mark-ups was whether the costs of handsets (ie, handset subsidies), which on average exceeded £680m in total, should be partly recovered through call termination charges. MNOs made the case that, on distributional grounds, handset subsidies were a benefit to all customers, as existing subscribers benefit when new customers decide to join a mobile network.

<sup>3</sup> Super-elasticities are modified-demand elasticities that account for complementarity and substitution among products. That is, the super-elasticity of a product encompasses that product's own- and cross-price elasticities. If the demands between the products in question are independent, the super-elasticity of a product is equal to the ordinary demand elasticity for that product.

The Competition Commission refused to allow most of the retail costs incurred by the MNOs (including handset subsidies, customer care and billing) to be recovered through call termination. The Commission did not consider that there were significant benefits to all network users as a result of additional customers joining the networks, since the handset subsidies were having only a limited impact on the recruitment of new marginal subscribers. Instead, the Commission considered that the subsidy was encouraging switching of existing subscribers between MNOs or funding handset upgrades. As a result, customers of fixed-line networks were funding a subsidy from which they derived little benefit.

By refusing to allow for the recovery of any of the customer acquisition costs, the amount of common costs that the Commission allowed to be recovered through the mark-up was small. As a result, in the context of the mobile call termination charges, any distortion of the EPMU was modest.

## 2.2 2004 Ofcom's market review

More recently, the approach adopted by Ofcom in its review of the wholesale mobile voice call termination market is in line with the Competition Commission inquiry and with Oftel's proposals during the Commission's inquiry. (Ofcom 2004)

Ofcom has set the target charges for 2G mobile voice call termination on the basis of LRIC plus a mark-up for common costs, according to the EPMU approach. Ofcom has confirmed its view with regard to Ramsey pricing, by concluding that:

the derivation of Ramsey prices, or more generally of welfare-optimal prices, raises complex conceptual and practical issues which do not allow for sufficiently reliable optimal prices to be estimated. (Ofcom 2004, para 6.8)

The reasons behind the regulator's view against using Ramsey principles in the mobile sector (Ofcom 2003, Annex K) were in line with those of the Competition Commission, namely:

- the difficulties in calculating reliable prices according to Ramsey principles or any other approach that bases mark-ups on the relative super-elasticities of the services. Among the problems identified by the regulator are the difficulties of robust econometric estimates of elasticities, and the over-simplification of the models used to estimate the optimal mark-ups;
- that it is unlikely that all the other prices for mobile services would be set at the Ramsey level. A correct application of Ramsey pricing would involve the whole set of mobile prices (retail and call termination). If, according to Oftel, the termination charges were set using the Ramsey principle, the structure of mobile prices would be efficient only if the operators had the incentives to set Ramsey-based prices for the retail prices. However, the regulator believed that the operators do not have these incentives. Consequently, and given that the regulator had no intention of regulating the prices of retail services, Ofcom concluded that setting Ramsey termination charges would not maximise social welfare; (Ibid, K.9 and K.10)
- distributional inequalities—the regulator considered that the people most adversely affected by high termination charges are those without a mobile phone (a group that includes a significant proportion of elderly and low-income people), as these people call mobile phones but do not themselves own one.

It is, however, important to understand the context in which Ofcom has opted for an EPMU approach, rather than a demand-based approach, such as Ramsey. In particular, the regulator has stated that:

Ofcom has not maintained that the EPMU methodology is theoretically more efficient than Ramsey pricing principles. Ofcom considers that, given the limited size of the common costs and the difficulties of setting efficient mark-ups, the use of an EPMU for common costs and a mark-up for the un-internalised network externality achieves a more appropriate balance between practicality and efficiency than the Ramsey methodology. (Ofcom 2004, para 6.19.)

This statement confirms that, as long as the common costs to be recovered are small and/or demand elasticities are not reliably identified, Ofcom judges the use of an EPMU approach to be reasonable. Where these conditions do not hold, it is not clear what position Ofcom would adopt.

In line with the Competition Commission mobiles inquiry, Ofcom allowed an EPMU for network common costs of around 5% of total network costs.<sup>4</sup> With regard to non-network common costs, the regulator allowed around £64m of administrative costs (ie, around 7% of the average network costs) to be recovered through an EPMU.<sup>5</sup>

<sup>4</sup> This figure is for 900MHz operators.

<sup>5</sup> The allowed non-network cost was around 40% of the total administrative costs (around £159m). The percentage allowed was determined as the proportion of network costs divided by the sum of network and retail costs. Average network costs in 2001 were over £850m and total average retail costs exceeded £1.2 billion. See Ofcom (2004), Annex C.

## 3 Relevance for the UK postal services sector

To support its decision to adopt an EPMU approach, Postcomm appears, at least partly, to be drawing on precedents of similar decisions taken by the Competition Commission and Ofcom. However, these regulatory decisions should be analysed in the context of the specific characteristics of the mobile telephony industry.

The rationale and arguments for using an EPMU allocation approach considered by the Commission and Ofcom are not necessarily applicable to the context of the UK postal services sector, where a demand-based approach may be more appropriate. Indeed, the analysis of the regulatory precedents in the mobile telephony sector, presented in the previous section, suggests that a number of issues, raised by the Competition Commission and Ofcom, should be taken into account when analysing the relevance of different approaches to cost allocation in the UK postal services.

### 3.1 Structure of prices

As mentioned in the previous section, Ofcom considered that a correct application of the Ramsey approach would require consideration of the whole set of prices of all mobile services, and not just call termination. It is not clear whether the rationale used by Ofcom against adopting the Ramsey principle to set termination charges could be easily applied to the UK postal services market. According to Ofcom, the MNOs did not have any incentives to set Ramsey-based prices for retail services. Given that the regulator did not intend to regulate the mobile retail market, there would be a risk that setting Ramsey termination charges would not maximise social welfare. Unlike the mobile sector, in the UK postal services sector, most of Royal Mail's retail services are currently regulated;<sup>6</sup> this concern of the telecommunications regulator (and the Competition Commission) is therefore less likely to hold.

### 3.2 Demand elasticities

Examination of the demand elasticities of the different products in question could provide an understanding of the extent of any distortion that may occur as a result of adopting an EPMU approach rather than a welfare-maximising approach. If the elasticities of the different products do not show large differences, the efficiency distortions in using the EPMU approach may be small (assuming, in addition, that the proportion of common costs to be recovered is small). Indeed, as pointed out by the Competition Commission, the EPMU would be equivalent to a demand-based approach of cost allocation such as Ramsey when all the super-elasticities of the different products in question are equal.

In the mobile case, the Competition Commission and Ofcom considered that the estimates of demand elasticities were not sufficiently reliable to justify the adoption of a demand-based approach to cost allocation.<sup>7</sup> Unlike the mobile sector, in the postal services sector there appears to be a broader consensus with regard to elasticities of postal services, suggesting,

<sup>6</sup> In 2003/04, the revenues from the price-controlled services amounted to around 90% of Royal Mail's total revenue from inland and international mail.

<sup>7</sup> For example, Ofcom considered problems related to identifying prices for the wide variety of pricing packages, lack of sufficiently long time-series of data, and exclusion of mobile services. Furthermore, both the Competition Commission and Ofcom pointed out problems related to discrepancies between the elasticity estimates presented by the MNOs. See Ofcom (2003), Annex K.

for example, that the elasticities of the different products, such as public tariff and presort, or first class and second class, are unlikely to be similar.<sup>8</sup> Therefore, any distortions that may occur as a result of adopting an EPMU are unlikely to be negligible. In this scenario, the discrepancies that would result from assuming equal demand elasticities for the products in question may be more significant the greater the degree of entry faced by the USP.

### 3.3 Size of the common costs

The impact of adopting a particular approach to allocate common costs cannot be isolated from the size of the common costs that are to be recovered through a mark-up.

In the case of mobiles, as shown in the previous section, the regulator determined that the proportion of genuine fixed and common costs to be recovered through the mark-up was small, and therefore, arguably, the issue of how the mark-ups are set is of less importance than in a sector where common costs are large. Indeed, Ofcom's endorsement of the EPMU was one of achieving 'a balance between practicality and efficiency', given the limited size of common costs and the difficulties of setting efficient mark-ups. As a consequence, any distortion would be relatively modest.

However, in the postal services sector, a key issue for the approach to cost allocation is the presence of significant common costs, which can be related to the provision of the universal service obligation (USO). Indeed, Royal Mail's costing and contribution system attributes 53% of total costs, which leaves 47% of costs to be allocated—this is appreciably higher than the costs recovered through the mark-up in the mobile sector (Postcomm 2004, para 4.45). In this context, where common costs are significant, and demand sensitivities are likely to differ between postal services, an EPMU may produce a less efficient outcome than a welfare-maximising approach. As a result, an approach that has regard to the impact of prices or demand deserves more consideration than that given to it by Postcomm.

<sup>8</sup> For example, several papers have found that presort/bulk products are more responsive to price than public tariff/single piece products, and first-class mail is generally more elastic than second-class mail. See, for example, Nankevis et al (2002); Crew and Kleindorfer (2002); De Rycke et al (2001); Florens et al (2002).

## 4 Conclusions

Fundamental to the Competition Commission's approach to assessing the costs of call termination is the 'cost-causality principle'—ie, a party calling a mobile phone should incur only the costs that are caused by making that call. The Commission recognised the theoretical benefits of demand-based approaches, such as Ramsey pricing, but considered that the implementation of this approach in the mobile sector would be problematic, and would be against its favoured cost-causality approach.

The approach adopted by the Commission yielded a result close to Oftel's EPMU proposals, although, strictly speaking, the Commission did not endorse the EPMU, as it considered this to be inconsistent with its preferred approach.

As mentioned in section 1 of this report, Postcomm seems to suggest that Ramsey pricing, at its extreme, would not be appropriate for a company with a strong monopoly position in the early stages of a developing competitive market (Postcomm 2005a, para 4.19). Indeed, Postcomm has strongly asserted that EPMU is appropriate in the postal services sector.

From the review of regulatory precedent in the mobile telephony industry, it emerges that EPMU would be an acceptable approach if the costs to be recovered were small and if demand elasticities for the services in question were similar. However, where common costs are significant, and/or demand elasticities differ between products, as evidenced in the postal services sector, an EPMU approach to allocate common costs could be less appropriate.

Hence, Postcomm's statements on the regulatory precedents of EPMU are not relevant as a justification for it to adopt an EPMU approach because they do not consider sufficiently the context of the postal services sector.

Furthermore, the adoption of alternative approaches to cost allocation and pricing rules when setting a price control cannot be taken in isolation from the market conditions in which the USP operates and from the regulator's statutory duties. In the case of the UK postal services sector, where the market will be fully opened from January 2006, Postcomm's primary duty is to ensure the financial viability of the USP.

If the market condition is such that the USO includes an obligation to maintain geographically averaged prices and to fund it through cross-subsidies by the USP, it is important to identify a range of cost allocation and pricing rules that would allow the USP to recover its costs and earn a return. In this context, the impact on welfare, average prices, and the financial viability of the USP of different approaches to allocating a given amount of fixed and common costs between several products would vary depending on the degree of market entry.

## 5 References

- Competition Commission (2003), 'Vodafone, O2, Orange and T-Mobile: Reports on references under section 13 of the Telecommunications Act 1984 on the charges made by Vodafone, O2, Orange and T-Mobile for terminating calls from fixed and mobile networks'.
- Crew, M. and Kleindorfer, P. (2002), 'Two-Tier Pricing under Liberalization', in M. Crew and P. Kleindorfer (eds) (2002).
- Crew, M. and Kleindorfer P. (eds) (2002), *Postal and Delivery Services: Pricing, Productivity, Regulation and Strategy*, Boston, MA: Kluwer Academic Publishers.
- Crew M. and Kleindorfer, P. (eds) (2001), *Future Directions in Postal Reform*, Boston, MA: Kluwer Academic Publishers.
- De Donder, P., Cremer, H., Dudley, P. and Rodriguez, F. (2005), 'Pricing and Welfare Implications of Alternative Approaches to Setting Price Controls in the Postal Sector', draft paper presented at the XIII Conference on Postal and Delivery Economics, Antwerp.
- De Rycke, M., Marcy, S. and Florens, J.-P. (2001), 'Mail Use by Firms', in M. Crew and P. Kleindorfer (eds) (2001).
- Florens, J.-P., Marcy, S. and Toledano, J. (2002), 'Mail Demand in the Long and Short Term', in M. Crew and P. Kleindorfer (eds) (2002).
- Nankevis, J., Richard, S., Soteri, S. and Rodriguez, F. (2002), 'Disaggregated Letter Traffic Demand in the UK', in M. Crew and P. Kleindorfer (eds) (2002).
- Ofcom (2004), 'Wholesale Mobile Voice Call Termination', Statement, June 1st.
- Oftel (2003), 'Wholesale Mobile Voice Call Termination: Proposals for the identification and analysis of markets, determination of market power and setting of SMP conditions', December 19th.
- Postcomm (2003), 'Notice of a Proposed Direction to Royal Mail on Downstream Access, by UK Mail, to Royal Mail's Postal Facilities', May.
- Postcomm (2005a), 'Royal Mail's Revised Proposals for Size-Based Pricing ("Pricing in Proportion")', Consultation Document, April.
- Postcomm (2005b), '2006 Royal Mail Price and Service Quality Review', Initial Proposals, June.

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