

Practical Approaches to USO Costing and Financing

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1 Introduction

Assessing the net cost and unfair burden of universal service obligations (USO), and determining how this should be financed, is a key issue for operators, regulators and other stakeholders in the European postal industry. The Third Postal Directive 2008/6/EC (Third Directive) provides some guidance as to how the net cost should be calculated, however, there is no defined prescriptive approach. The calculation of the net cost of the USO is extremely complex and given that it is likely to be funded by the public or other operators any assessment needs to be extremely robust. In this paper we propose to present a robust and practical approach to assessing properly the net cost of the USO in line with the guidance provided by the Third Directive.

Traditionally, financing of the universal service in the postal sector has relied on granting the provider a reserved area. The need for alternative funding sources after full liberalisation has increased the interest of regulators and the public in knowing the cost of universal service provision and compensating the universal service provider (USP) appropriately. Recent attempts at assessing the net cost of the USO have been based on the profitability cost approach pioneered by Panzar (2000) and Cremer et al. (2000).

Recently academics have argued that the market structure within which the incumbent operates and the actual cost/burden of USO are directly related to the regulatory regime and the funding mechanism in place (Jaag and Trinkner (2010) and Boldron et al. (2009)). Additionally, they state that individual elements or dimensions of the USO cannot be priced separately because this would either result in inconsistent or biased cost estimates (Jaag, Koller and Trinkner (2009)).

Calculating the net cost of the USO involves comparing the difference in profit levels with and without the USO. This implies knowing the differences in costs and revenues in scenarios with and without the USO. The Third Directive states that when calculating the net cost, the impact on profits and all other relevant elements, which accrue to a USP, must be considered. While the cost side is relatively easily understood because it is directly linked to products and processes, the revenue side is more difficult to assess (and not yet fully understood) because indirect effects need to be taken into account (“intangible benefits”). Moreover, the changes from current practice implied by relaxing USO constraints may be sufficiently large to undermine the reliability of historical estimates of elasticities, e.g. with respect to quality, in predicting demand changes.

In this paper we set out a holistic approach that incorporates recent developments in assessing the net cost of the USO and presents a robust methodology for practical

implementation. We analyse the issues relating to assessing the net costs of the USO with particular focus on the benefits associated with USO and current empirical approaches to calculating the net costs. We then present an overview of approaches that have been applied in various countries and highlight their strengths and shortcomings in light of the necessarily theoretical aspects discussed in the first part of the paper. Finally, we present a practical approach that we believe assesses robustly the net cost of the USO.

2 Issues in USO-Costing

Article 7 of the Third Directive states:

“Where a Member State determines that the universal service obligations [...] entail a **net cost** [...] and represent an unfair financial burden on the universal service provider(s), it may introduce:

- a mechanism to compensate the undertaking(s) concerned from public funds; or
- a mechanism for the sharing of the net cost of the universal service obligations between providers of services and/or users.”

Annex I contains guidance on how to calculate the net cost of the USO:

“The net cost of universal service obligations is any cost related to and necessary for the operation of the universal service provision. The net cost of universal service obligations is to be calculated, as the difference between the net cost for a designated universal service provider of operating with the universal service obligations and the same postal service provider operating without the universal service obligations.

The calculation shall take into account all other relevant elements, including any intangible and market benefits which accrue to a postal service provider designated to provide universal service, the entitlement to a reasonable profit and incentives for cost efficiency.”

Annex I implies using the profitability cost approach, i.e. a calculation of the cost of the USO assuming the competitive effects of introducing asymmetric obligations to selected market participants in a comprehensive and consistent way.¹

Annex I further states that the net cost should be computed individually for the various USO elements and “summed up” to avoiding double counting:

“The calculation of the net cost of specific aspects of universal service obligations is to be made separately and so as to avoid the double counting of any direct or indirect benefits and costs. The overall net cost of universal service obligations to any designated universal service provider is to be calculated as the sum of the net costs arising from the specific components of universal service obligations, taking account of any intangible benefits.”

¹ The Directive states that compensation for the USP may only be introduced if the USO entails a net cost and represents an unfair burden. Similarly to quantifying the benefits of the USO, there has been little economic discussion as to how exactly define an unfair burden. In this paper we focus on the costing of the USO rather than the definition of an unfair burden. See Jaag (2010) for a discussion of various different criteria by which the (un-)fairness of a burden could be assessed and by which the appropriateness and the level of compensation could be determined. See also CERP (2008), Boldron et al. (2009) and de Donder et al. (2010).

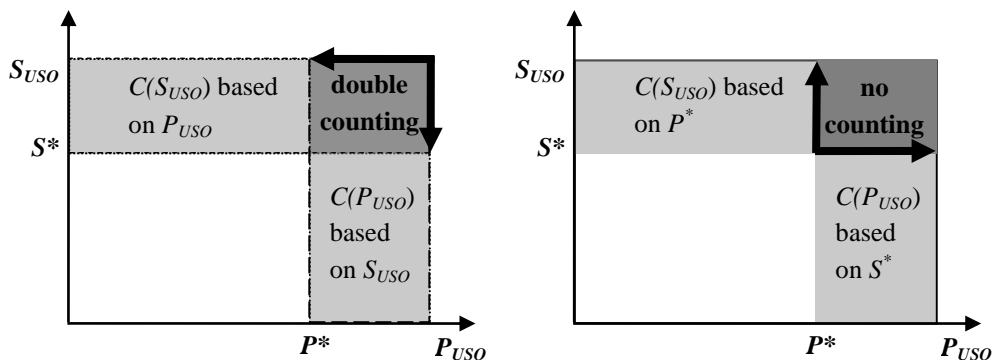
The Third Directive raises three critical issues regarding calculation of the net cost of the USO: The individual assessment of specific aspects of the USO; consideration of intangible and market benefits; and interaction between costing and financing. We discuss each of these issues below.

2.1 Costing of individual elements of the USO

The Third Directive states that net costs should be computed separately across the various USO elements so as to avoid double counting of costs and benefits. However, as has previously been identified, e.g. in Jaag, Koller and Trinkner (2009), the inherent problem with such a disaggregated approach is the presence of interdependencies between the individual USO elements. In Figure 1 we illustrate the case of two USO dimensions: restrictions on pricing and on the range of services offered.

Figure 1: Importance of the interdependence of USO dimensions.

Source: Jaag, Koller and Trinkner (2009)



In Figure 1, the vertical axis represents restrictions on the product/ service (S) with restrictions in pricing on the horizontal axis (P). The square with the black border depicts the total 'cost' of the universal service provision in its current scope defined as S_{USO} and P_{USO} . The white area is the total 'cost' of a reduced, non-binding universal service provision defined such that the USO operator can realise its optimal business strategy in both dimensions as if there had been no obligation (S^* and P^*). The sum of all the grey areas (the difference between the bordered and the white area, $S_{USO} \times P_{USO}$ minus $S^* \times P^*$) is the incremental cost of the USO in both dimensions. Because S^* and P^* are profit maximising positions, imposing S_{USO} and P_{USO} results in an incremental net cost.

As illustrated (on the left-hand side of Figure 1), double counting is a problem if the net costs of the obligations are computed separately based on actual universal service restrictions in the other dimension(s). However, if the net cost of each dimension is calculated based on a scenario with no other obligations (right-hand side of Figure 1), an important part of the net cost is neglected. Consequently, the cost of this combined restriction is significantly higher than the costs derived from a separate approach. It is therefore necessary to integrate those USO dimensions.

Therefore, to assess properly the net cost of the USO, a holistic approach is required that accounts for these price and product interdependencies. This approach should also incorporate the interaction with potential intangible benefits as discussed below.

2.2 Intangible benefits

The Directive states that intangible benefits should be calculated separately to avoid the double counting of any direct or indirect benefits and costs. However, all benefits of the USO and the incremental costs of the USO are both intrinsically linked to an operator's profits. Assessing net cost of the USO should therefore involve a holistic approach including an assessment of the intangible benefits related to the USO. Therefore, any assessment should include reviewing the types of benefits associated with being the USP before developing a sufficiently robust profitability approach that includes these benefits in the calculation.

Our discussion in Section 3 will show that recent attempts at quantifying the net cost of the USO have involved making separate quantitative assessments of intangible benefits or no assessment at all.

Types of benefits

Typically an assessment of the benefits associated with a USP will refer to economic literature and research undertaken in the postal sector. However, our review of existing literature on the costs and benefits of a USO in the postal sector has identified little in the way of previous work on the benefits, particularly in terms of quantification. Therefore, emphasis will need to be placed on comparable analysis that has been performed in other regulated sectors. However, in doing so care needs to be taken to ensure that the benefits identified in other sectors are relevant to post. For instance, telecommunications is often used as a comparable sector when considering the benefits associated with the USO. In telecommunications, a key benefit is the "Life Cycle Effect".² This relates to the benefit of serving a group of unprofitable customers today with the view that they will become more profitable in the future. However, with large volume declines, falling revenues, and increased competition in the postal sector such benefits are unlikely to exist. Therefore, a careful assessment of the types of benefits to include is required.

Benefits implicitly included in the net cost of the USO calculation

The Directive calls for separate consideration of intangible benefits, however from an economic point of view, the benefits of the USO should not be assessed independently from the incremental costs of the USO as they are both intrinsically linked to an operator's profits.

² See e.g. Oftel (2000).

The net cost of the USO should be calculated as the profits of the USP acting as a profit maximising entity ('but-for' scenario) minus the profits of the USP performing the current USO (cf. Panzar, 2000, and Cremer et al., 2000). By definition, any benefits relating to USO products would be included in this calculation. Additionally, the majority of the broader benefits related to being the USO provider, such as possible USO associated customer loyalty or incremental profits associated with non-USO products, would also be included in this assessment. For instance, a benefit to the USP is the sale of non-USO products that are delivered to customers 6 days a week. If in the 'but-for' scenario the USP decided that it would not deliver 6 days a week, then it is likely that some of this non-USO volume that was delivered on the back of the 6-day a week service would be lost to competitors or would migrate to alternative products with different levels of profitability. This loss in incremental profit can be quantified as a benefit of the USO. Additionally, benefits such as VAT exemptions can be included in the 'but-for' scenario by including all VAT effects explicitly (cf. Dietl et al., 2010, which elaborates the competitive effects of VAT exemptions in the postal sector).

These examples illustrate that the USO reduces the profits of the operator by placing extra costs on operations; however, some of this reduced profit is mitigated by benefits that increase profits.

In comparing the operator's actual financial performance against the 'but-for' scenario we remove the impact of the costs of the USO and the benefits - the profit we are left with is that of a profit-maximising operator. This approach provides the net cost of the USO including costs and benefits and is discussed in more detail in Section 4.

2.3 Interaction of costing and financing

The net cost of USO using the profitability approach also depends on the design of the compensation mechanism, because the financing mechanism distorts the market outcome. This issue has been discussed by e.g. Jaag and Trinkner (2010), Borsenberger et al. (2010), and Jaag (2010). If the amount of compensation is determined before the financing mechanism is devised, the net compensation from an ex post perspective may be incorrect. If the USP is compensated from the general government budget, this does not (or only insignificantly) affect the market equilibrium. In this case, USO costing and financing are independent of each other. However, if there is a turnover or unit tax levied from the operators in the market in order to finance the USP's contribution, this affects the operators' effective marginal cost and therefore distorts their pricing and possibly market entry decisions. This distortion needs to be considered when calculating the USO net cost. Sequentially calculating the net cost and then determining the operators' contribution to a USO fund – as envisioned in the Directive – may result in a huge over- (or under-)

compensation of the USP (See Jaag (2010)). A compensation fund to which all operators (including the USP) contribute according to their market shares will lead to an under-compensation as the USP contributes to the majority of compensation itself. In contrast, if the USP is excluded from contributions, this will result in over-compensation: The competitors' marginal cost increases due to their contribution to the fund such that they are less competitive. This reduces their optimal scope of operations (e.g. with respect to their profitable product range and/or regional coverage) which positively affects the USP's market position.

We therefore propose an integrated approach to USO costing and financing where the regulatory authority sets the contribution rate such that the USP's profits remains unchanged comparing a situation without USO and one with USO after compensation.

2.4 Summary

The calculation of the net cost of the USO is extremely complex. Given that it is likely to be funded by the public or operators, any assessment needs to be robust. We argue that an integrated approach is required to calculate the net cost of the USO which includes a robust counterfactual that considers the interaction of the different USO elements/requirements, the intangible benefits and the financing mechanism. This approach would need to be consistent and transparent to generate accurate results. In the next section we will briefly discuss some of the approaches that have been applied to assessing the net cost of the USO.

3 Approaches to USO-Costing

To understand the approaches that have been adopted in the postal sector, we have reviewed some prominent recent studies assessing the net cost of the USO in three European countries. Owing to space considerations, we have omitted a detailed discussion of a study of the United States completed by Cohen and McBride (2008). We do, however, include a summary in the table below.

Table 1: USO costing approaches and their consideration of different USO dimensions

	Denmark	Norway	United Kingdom	United States
Study/Source	Copenhagen Economics (2008)	Norway Post (2010)	Frontier Economics (2008)	Cohen and McBride (2008)
Purpose	Inform policy	Determine subsidy	Inform policy	Inform policy
Services / USO elements considered	Delivery freq.; Nationwide delivery; Some other elements	Delivery freq.; Post office services; Free services to the blind; etc.	Delivery freq.; Routing time targets; Single class of mail; Geographic coverage not considered	Delivery freq.; Nonprofit discounts; Unzoned media rates; Losses on market dominant products; Some other elements
Without-USO counterfactual	Yes	Yes	Use regulator - suggested changes	Yes
Consideration of interaction between USO dimensions	Partial. E.g. price differentiation mitigates delivery to expensive postcodes	Not clear	No	No
Consideration of interaction between USO costing and financing	No	Not clear	No	No
Consideration of intangible benefits	Qualitatively, e.g. marketing nationwide coverage offsets a USO cost element.	Not clear	No	No
USO cost	FY 2005: DKK 148m (€20m) 1.5% of op. ex.	FY 2006: NOK 253m (€31m) 2.3% of op. ex. FY 2010: NOK 497m (€57m)	FY 2006/07: Saturday service: GBP 271m (€400m) 4% of op. ex.	FY 2007: \$7.63bn (€5.57m), 10% of revenue

Source: Copenhagen Economics (2008). Cohen and McBride (2008). Dieke and Niederpruem (2008), page 37. Frontier Economics (2008). Weseth (2010). Note: Historical average annual exchange rates compiled by the ECB are used to convert all amounts to Euros. Norway 2010 amount is estimated by Weseth (2010) using 2009 average exchange rate.

These studies rely on the profitability cost approach described above using a counterfactual non-USO scenario to calculate the net cost for different USO requirements. Most approaches consider both the direct and indirect volume impacts within the cost calculation for each element. An indirect volume impact involves, for example, the effect on weekday volumes of eliminating Saturday deliveries. Our review identifies that none of the studies fully considers the simultaneous interaction of changes in different USO elements, financing and intangible benefit assessment, as we advocate in this paper. This should not necessarily be construed as a criticism of the authors of these studies as often authors are restricted by the scope of work they have been engaged to perform. The

table summarises the overall conclusions of our review. We discuss the approach in each country in more detail.

3.1 Denmark

The Danish Chamber of Commerce commissioned Copenhagen Economics to calculate the cost of the USO to Post Danmark. The study considers the cost of 15 USO elements in a four step profitability cost approach which:

- 1) determines whether a USO element constrains Post Danmark;
- 2) describes Post Danmark's commercial options in the absence of the USO, and, for each element that is determined to be a constraint, calculates the associated reduction in cost;
- 3) calculates the corresponding loss in revenue for each element; and
- 4) subtracts the revenues from the costs to determine the net cost of each USO element.

Of the 15 elements considered only two are found to result in a net cost:³

- the inability to reduce the frequency of mail delivery from six days to five days (DKK130m, €17m, 2005); and
- the inability to eliminate free delivery to the blind result (DKK18m, €2m, 2005).

Only the interaction between selected elements of the USO is considered. For example, in the counterfactual scenario it is suggested the flexibility offered by price-differentiation would, in part, prevent the reduction of deliveries to the most expensive postcode areas. The effect is not quantified, however, and cannot be said to form part of a systematic holistic approach aimed at considering all interactions. The report also does not include a discussion of the impact of the choice of financing mechanism.

Copenhagen Economics suggests that intangible benefits offset the net cost of certain elements of the USO but without quantifying their benefits. For example, the DKK40m (€5m, 2005) cost of delivering mail to the 1% of the population in the most expensive postcode areas was offset because, it is argued, that Post Danmark would not reduce the service due to the benefits of the sales generated by offering a nationwide service. Other intangible benefits mentioned but not quantified are customer loyalty from Post Danmark's time as a monopoly (goodwill) and other competitive advantages such as VAT exemption and ownership of the postal network. The report does not establish a consistent analytical approach to evaluate the intangible benefits and their overall impact on all USO elements.

³ Copenhagen Economics (2008), page 12.

The study concludes there is no unfair burden because the net costs are offset by the Post Danmark's benefits as incumbent, specifically the goodwill and customer loyalty generated by its previous monopoly status, its VAT exemption and ownership of the postal network.

3.2 Norway

Norway Post uses a profitability cost model, the "Alternative commercial strategy" (ACS) model to estimate the net cost of the USO annually. The Norwegian State uses this estimate in deciding whether the USO is sufficiently funded through monopoly profits or merits state funding.

The ACS counterfactual is modelled to be close to the current commercial strategy because, it is contended, Norway Post's message to its customers, employees and various government authorities regarding its service quality, low prices, high productivity, etc. is that it is only in small part determined by the cost of the USO. We argue that this may be an overly restrictive assumption making the counterfactual less realistic. ACS is also limited by its compartmentalised calculations and lack of a holistic approach taking simultaneous account of benefits and funding mechanisms.

The counterfactual considered by Norway Post consists of a service with different delivery times for some households and changes to the post-office structure. The ACS will cut delivery service from 6 days to 5 days for 15% of households and to 2 days for 5% of households, generating annual savings of €12m and €29m, respectively. Under the ACS more post offices will be run by third parties and they will not offer bank services, resulting in an annual net cost saving of €15m. This latter change to the post office structure is modelled to have no significant effect on postal volume, although all revenues from bank services are lost.⁴ All other elements considered, together result in an annual €1m cost saving. This approach does not appear to consider interdependencies between USO elements or financing mechanisms as advocated in this paper.

Norway Post considers its ACS to be compatible with the Third Directive's requirement that it takes account of intangible benefits. In particular, it argues that *"Norway Post's benefits from the USO are implicitly taken into account in the definition of the ACS"*,⁵ though it is not clear how this is implemented in practice. Although Norway Post recognises that its earlier model *"failed to take account of network economies, such as the effect of service termination in one region on the demand in other*

⁴ Weseth (2010), slide 7.

⁵ Weseth (2010), slide 7.

regions”,⁶ it is not clear to us that these effects have been appropriately modelled in the ACS.

The model estimates the total net cost of the USO as €57m for 2010. Since 2006, the government has not subsidised the USO because it expects profits from Norway Post’s other businesses to be sufficient to cover this cost, i.e. it does not consider that an unfair burden exists. Arguably, this indicates that the government does not believe that the ACS model takes all of the intangible benefits properly into consideration.

3.3 United Kingdom

In 2008, Postcomm engaged Frontier Economics to produce a report on the cost of specific elements of Royal Mail’s USO, assuming specific alternative requirements determined by Postcomm. The report does not consider many important components of the USO, for example the universal geographic delivery coverage obligation. The model used consists of two stages, the first considers the non-price demand and market share effects that lead to the estimate of the net cost. Price effects are not considered in the first stage. In the second stage a new price is calculated to reflect 100% of the cost saving being passed through to consumers, i.e. no commercial decision-making is assumed. Frontier Economics then calculates volume effects but considers the net cost to be negligible.

Frontier Economics’ model aims to ensure consistency between volumes, revenues, costs and Royal Mail’s commercial incentives by using “*an engineering cost model capturing operation standards and economic principles applying in post*”.⁷ It does not, however, consider in its stage one calculation the interaction with other USO dimensions like pricing, universal geographic coverage, the effect of the choice of financing mechanism, nor the value of the intangible benefits of the USO.

The report concludes that, of the six USO elements considered, only the Saturday collections and delivery service “*imposes a significant constraint on Royal Mail*”, the cost of which it calculates as £271m (€400m, 2006/07). The report concludes that Royal Mail “*is not significantly disadvantaged*” by the USO.⁸ The basis for this conclusion appears to be the fact that this amount is equivalent to an approximate annual efficiency target over four years of 1% of Royal Mail’s cost base and is only a third of the current price control’s efficiency targets of 3% per year.⁹ In our view, the report confounds efficiencies and a net cost that is by its very nature an obligation outside the influence of management. Frontier Economics does not discuss whether

⁶ Weseth (2010), slide 7.

⁷ Frontier Economics (2008), page 76.

⁸ Frontier Economics (2008), pages 14, 15.

⁹ Frontier Economics (2008), page 8.

the net cost burden is unfair but its failure to find Royal Mail to be significantly disadvantaged suggests that they do not consider the burden to be unfair.

3.4 Summary

In summary, none of the studies of the net cost of a postal sector USO discussed above used a fully holistic approach to consider simultaneously the interaction between different elements of the USO, intangible benefits and financing.

4 A Consistent Approach to USO costing and Financing

As we have already argued, in order to obtain robust results, a holistic approach to the costing of the USO is needed. To produce accurate, consistent and transparent results, our USO costing approach rests on a sound methodological foundation. It is based on a standard industrial organisation model of the postal sector, taking into account the operators' market entry and pricing decisions. This ensures the approach is compliant with the Third Directive and possibly with standards set by CERP or the national regulatory authority (NRA).

A legal definition of the USO costing approach needs to embrace the basic methodology, the model structure and a description of how to calibrate the model. We therefore propose the following steps in defining and setting up a USO costing model:

First, the model structure has to be defined, including binding USO constraints, the operators' pipeline activities and the relevant markets and products that are affected by changes in the USO.

Once the structure is defined, the model is populated with data on prices, volumes, elasticities, etc. These data can have various sources, for example the USP's accounts, market research, benchmark studies, consumer surveys, etc. Based on this information, the USP's optimum behaviour and the ultimate market outcome in the counterfactual scenario can be derived.

Figure 2: Developing a model for USO costing and financing

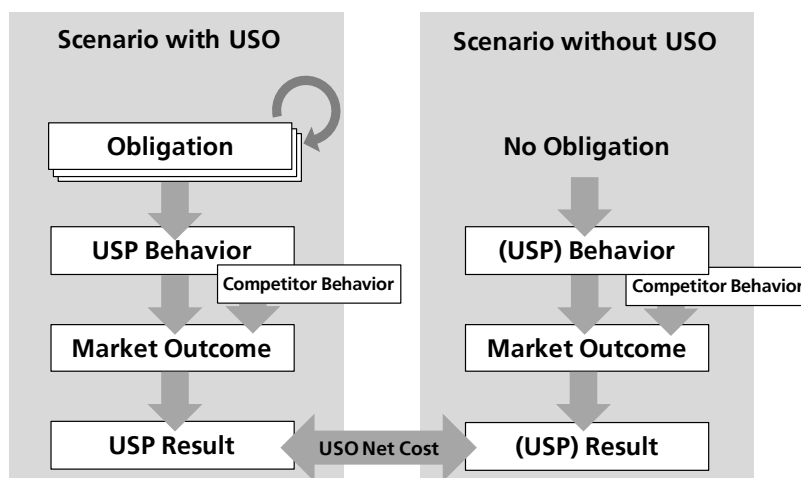


We discuss each step in more detail below.

4.1 Basic Methodology

The Directive advocates using the profitability cost approach, comparing the USP's profit with and without USO. The USP's profit is determined by the market outcome in each scenario which itself results from the USP's, the competitors' and of course their customers' behaviour (see Figure 3). It also depends on the financing mechanism in place (see section 2.3). This implies that it is crucial to first understand how certain dimensions of the USO and its financing affect the operators' behaviour.

Figure 3: Basic Methodology



The most important step in the calculation of the net cost is the definition of the counterfactual scenario. It describes the competitive market outcome without USO. All other regulations (e.g. price controls that are not part of the USO) and legal restrictions (e.g. competition law) still apply.

The counterfactual scenario is, in principle, independent of the USO costing model. In practice, however, the approach to calculate the net cost of the USO needs to be defined abstractly in a postal law or ordinance. Hence, it has to be open and flexible enough to embrace a broad range of potential counterfactuals. The USP's optimum behaviour varies with time and the development of the market. Hence, in practice, the definition of the counterfactual can only be settled after the model has been calibrated and once the impact of changes in the USP's behaviour is clearly understood.

4.2 Model structure

The following issues related to the model structure require particular attention:

Aggregation of separate USO dimensions: In principle, all dimensions of the USO that affect the USP's behaviour should be taken into account in the net cost calculation. We have already discussed in 2.1 that individual dimensions of the USO

should not be assessed separately as long as there is interaction between dimensions. It therefore makes sense to calculate the net cost of the USO dimensions separately only if and insofar as they are independent.

Relevant USO entity / markets and products: The USO costing approach defined in the Directive relates to the overall profit of the USP rather than the profits solely from USO products. Hence, the analysis should consider all business units which are affected by the USO or its absence. Usually, it will be all of the USP's operations which would change absent the USO – either on the cost or on the benefit side.

Relevant time-frame: A fundamental issue is defining the glide path to achieving the business environment defined in the counterfactual scenario. The USP would not be able to behave entirely differently immediately after being freed of the USO. Hence, it is necessary to define the time-frame within which the counterfactual is to be assessed. To derive robust results, it is most appropriate to consider a situation after full transition and once the USP and its competitors have fully adjusted their behaviour. In determining the USP's position in this counterfactual scenario, it is important to consider its investments and divestitures in the course of its hypothetical transition from the USO situation to the non-USO situation.

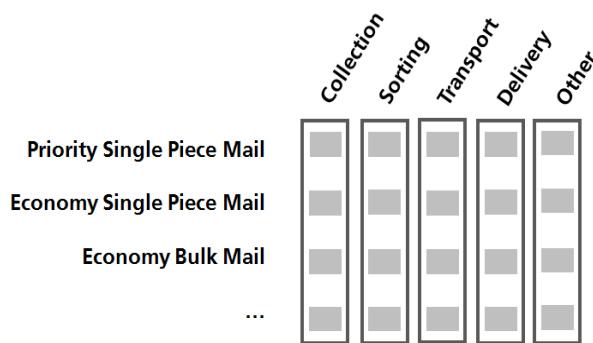
Relevant costs and benefits: Cost centres are closely linked to specific processes in postal operations. Hence, whether a process and its associated costs is relevant for determining the USO net cost depends directly on the USO through the requirements on the process steps (e.g. ubiquitous delivery), and indirectly on the USO-affected products passing through these process steps. Our approach considers a counterfactual situation after full adjustment to the removal of the USO; however, there are strong path-dependencies in the development of markets, leaving legacy costs and benefits which need to be taken into account. In the postal sector and in other network industries, such benefits may include an established ubiquitous legacy network and a good reputation (intangible benefits, e.g. brand value), see section 2.2. The existing inefficiently shaped network and high labour costs due to civil servant contracts are examples of legacy costs. In our approach, the counterfactual scenario includes the impact of removing all these costs and benefits. This relies on a deep understanding of the determinants of demand and cost functions.

Inefficiencies: The issue of inefficient operations is not specific to the costing of the USO. The counterfactual scenario typically involves a reduction in the USP's operations compared to the with-USO situation. Hence, with respect to the cost structure, the two scenarios are overlapping and inefficiencies partly cancel each other out in the comparison. For those services which would not be offered without the USO, inefficiency can be isolated and considered by reviewing the cost base to

assess whether an efficiency adjustment is required or by using benchmarking methods.

We have argued above that there is a trade-off between transparency, accuracy and consistency of the calculation method. This trade-off is especially important with regard to the granularity of the model and in view of the available data. To assess the impact of a change in the USO, in principle each step in the value chain of each product needs to be considered separately. However, due to the large portion of joint and common cost in postal production, it is difficult to allocate these to individual products (as required by the Third Directive).¹⁰ For the calculation of the net cost, it is not necessary to separate accounts as the total profit of the USP is of interest; not the profit of USO-products. Hence, actual cost data related to processes (e.g. collection, sorting, etc.) can be used on an aggregate basis, as illustrated in the figure below **Fehler! Verweisquelle konnte nicht gefunden werden.**

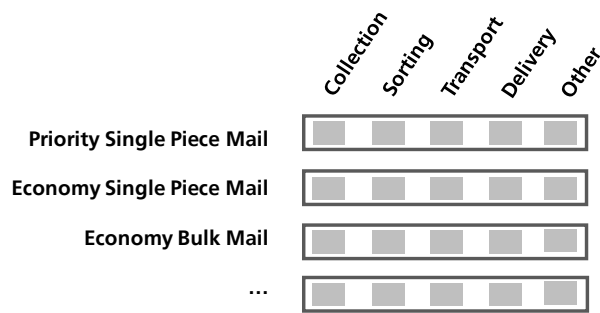
Figure 4: Cost aggregation by process



However, to calculate the USO net cost, there is another need for separation, namely between the services/products (and associated processes) that would be offered equally without a USO and those that would not. Similar to cost aggregation by process, revenue data can be aggregated by product (see Figure 5 **Fehler! Verweisquelle konnte nicht gefunden werden.**).

¹⁰ Article 14 of the Third Directive states that: "The universal service provider(s) shall keep separate accounts within their internal accounting systems in order to clearly distinguish between each of the services and products which are part of the universal service and those which are not. This accounting separation shall be used as an input when Member States calculate the net cost of the universal service." See Jaag (2010) for a discussion of information requirements.

Figure 5: Aggregation of benefits by services/products



With this granularity in the model, calculations will be much simplified and therefore the results are more transparent while still ensuring that the impact of a change in the strategy of the USP can be correctly quantified.

4.3 Model Calibration

The calibration of the USO costing model involves the population of the model – primarily with actual data, but also with the defined counterfactual scenario (i.e. the hypothetical behaviour of the USP, competitors, and consumers without USO). Of course, it is primarily the USP that knows its actual cost and revenue structure and that needs to determine its business strategy in the counterfactual scenario. However, its assumptions and all parts of the calculations must be well supported and examinable by the NRA or the ministry to give confidence in the evaluation. For instance, consideration on the level of unregulated prices that would be applied would need to be considered to ensure that they are in accordance with competition law.

4.4 Stylised Example

The above model description can be illustrated by a stylised example summarising the model and its results (see Table 2). The example is very much simplified and assumes zero variable costs.

Actual Situation with USO

In the example, the USO has three dimensions: First, it prescribes certain accessibility standards, e.g. that $x\%$ of the population must be able to reach the next self-run post office within at most y minutes and the next franchised counter within at most z minutes. This results in the USP’s observed behaviour with respect to number, location and type of post office and counters. Second, USO products must be delivered daily to all households in the country. Third, prices of the USO products (single-piece mail) must be uniform.

Counterfactual Situation without USO

Without a USO, we assume it would be optimal for the USP to rely fully on franchised counters, to restrict doorstep delivery to 80% of households and to regionally differentiate prices. The effects of the differences in the two scenarios are

displayed in Table 2.¹¹ Of course, there is a significant and straightforward effect on fixed costs. The effect on turnover (benefits) is less simple. In the USO-scenario, uniform pricing offers cherry-picking opportunities to competing operators. Hence, USP overall market shares for USO products are lower in the scenario with USO. However, quality is higher (at least for mail recipients who would not have doorstep delivery without USO), such that in equilibrium a higher average price can be maintained. In our example, bulk mail is not part of the USO and therefore not directly affected. However, the USP profits from its reputation and from the fact that all households are connected to the delivery network. Hence, without USO, the USP's market share, on average, is lower than with USO. Of course, in the calculation of the USO net cost, this effect has to be taken into account. It is assumed that there is a compensation mechanism in place, such that competitors have to contribute to the financing of the USO. This distorts their market coverage decision and thus positively affects the USP's market shares in the scenario with USO. Hence, the effect of the financing mechanism on the USP's volume weakens the negative effect of price uniformity on the market share of its USO products and reinforces the positive effect of ubiquity on the market share of its non-USO products.

Table 2: Stylised example

	Scenario with USO		Scenario without USO	
	Delivery			
Fixed Costs	Daily doorstep delivery with full area coverage	300	P.O. box delivery for 20% of households with highest delivery cost	200
	Postal Network			
	2000 self-run Post Offices	200	0 self-run Post Offices	0
	2000 franchised counters	100	3000 franchised counters	180
	USO Products			
Benefits	Uniform prices for single piece mail		Differentiated prices for single piece mail	
	80% market share single piece mail; average price 0.5€	400	90% market share single piece mail; average price 0.40€	360
	Non-USO Products			
	80% market share bulk mail; average price 0.3€	240	60% market share bulk mail; average price 0.25€	150
Profit		40		130

In our stylised example, the overall net cost amounts to 90 currency units.

¹¹ On the optimum behavior in the counterfactual scenario, see cf. Roy (2010).

5 Conclusion

Assessing the net cost and unfair burden of the USO, and determining how this should be financed, is a key issue for operators, regulators and other stakeholders in the European postal industry. The Third Directive provides some guidance as to how the net cost should be calculated. In our paper, we discuss how these specifications can be interpreted and applied in practice in order to result in consistent and robust assessment of the USO net cost.

In this paper we argue that a holistic approach is appropriate to meet these requirements. Therefore, calculating the net cost of the USO goes significantly beyond determining “unprofitable routes”. It is about assessing different competitive outcomes taking into account all relevant determinants of the USP’s demand and cost. As a prerequisite, it is important to understand how the USO affects the USP’s operations, its customers and its competitors. An important task in undertaking this analysis, therefore, is to properly define the environment in which the USP would exist without the USO.

When it comes to compensating a USP, net cost calculations must be accurate, robust and transparent. Therefore a detailed robust ‘but-for’ world in which the USP is assumed to be a profit-maximising entity needs to be developed.

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