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# Exploring the "last mile" in the postal sector[1]

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## 1. INTRODUCTION

This paper explores whether it would be commercially interesting for historical postal operators to redefine the "last postal mile". Indeed, the way the last postal mile has been defined and serviced so far has long historical origins and has hardly been questioned so far. Yet today, discussing the last mile in the postal sector is driven by three different considerations. First, mail volumes appear to decline, at least in the traditional letter market, leading to diminishing scale effects. Secondly, the changing consumer behavior that emerges from the ability of new information and communication technologies reduces somewhat the pressure on speedy delivery and leads to reconsider the definition of the Universal Postal Service in particular. Thirdly, there is a growing debate about whether or not access is to be granted to the competitors when it comes to the incumbent's distribution network.

All above three issues relate to the last postal mile, and thus to the question, whether or not some innovation is possible in the incumbent's distribution channel and whether this innovation is commercially interesting. Given the cost-sensitiveness of the last mile, postal operators are quite logically seeking ways to reduce costs precisely at the distribution end of the value chain, for example by reducing service levels. This paper looks at possibilities to give *more* value to the last mile and perhaps even turn it into a business in its own right.

This paper thus models, to our knowledge for the first time, a Receiver Pays Principle in the postal sector and tests it with empirical data. It is structured as follows: in Section 2, we briefly recall the question of the last mile in the other network industries so to have a better understanding as to

[1] The views expressed in this paper are those of the authors and do not necessarily reflect the opinion of Swiss Post.

whether and how the postal last mile is similar or different. In Section 3, we then turn to the question of the Universal Postal Service. Indeed, mail distribution remains a Universal Service obligation, and it is therefore necessary to explore which leeway an incumbent actually has when exploring new options for the last postal mile. In a fourth Section, we examine the question of who pays for delivery. Considering that in the postal sector the price of delivery has been paid exclusively by the sender, this topic will be discussed based on academic literature only. In Section 5, we define the various options a historical postal operator has at its disposal when it comes to defining and pricing the last mile. In Section 6, we evaluate the option of a monthly delivery fee that the *receivers* would have to pay when choosing traditional delivery in terms of welfare and operator's profit. Finally, in Section 7 we present and discuss our results.

This paper is a concept paper at an early stage. Its aim is neither to give an exhaustive literature review nor to offer a tried and tested model to be put into practice. Rather, we would like to foster the debate about new models for the last mile. In particular, we would like to know whether such a model has been put into practice somewhere and what additional considerations are needed in order to analyze the issue.

## 2. THE PROBLEM OF THE "LAST MILE"

The "last mile" is a typical concept of the network industries, such as telecommunications, railways, electricity, gas, and others more. As such, the last mile became an issue mainly because of the liberalization of these network industries, whereby the owners of the networks have given or have been forced by regulators to give access to their networks. More precisely, the concept of the last mile has been used first in the telecommunications sector, and is now increasingly also debated of the electricity sector. These two sectors, which have a high share of delivery costs in respect to total costs and which have a high share of fixed costs in delivery, do exhibit some structural similarities to the postal sector. In this chapter, we briefly recall the debates in these two sectors. In a concluding paragraph, we derive implications for the last mile in the postal sector.

In the telecommunications sector, the issue of the last mile has emerged relatively late. Indeed, it is only after the liberalization of the telecommunications equipment first, and of the telecommunications backbone later that the last mile became seen as a bottleneck and impediment to the total liberalization. As such, the last mile in the telecommunications sector defines the physical cable that links the individual household to the dispatching central owned by the historical operator. It is generally not deemed economical to duplicate this last mile for

economic reasons. Therefore, first the European Commission and subsequently the national regulators have forced the historical operators to open up their last miles to the competitors. As a consequence, the competitors now have direct access to the final customers, while simply renting the last mile at a regulated price. More recently, the debate has evolved in the telecommunications sector, as technological alternatives to the last mile of the historical operator are emerging. Such alternatives are the television cable, the electrical powerline, as well as broadband wireless access. It is therefore increasingly debated, whether access to the historical operator's last mile must be regulated, or whether technological competition is not sufficient in order to serve the consumers best. In short, technological progress in the telecommunications sector has actually made the regulatory debate about the last mile obsolete, and has turned it into a purely commercial question. Consumers now have different telecommunications last mile options[2].

In the electricity sector, the issue of the last mile is less evolved, yet, at least in the beginning of the liberalization process, very similar to the debate in the telecommunications sector. Indeed, with the liberalization of energy production, the local distributors remain monopolists, in that they own the connection to the final consumer at the household level. However, if the consumers chose to purchase their electricity no longer from their local distributor but from a far distant independent producer, the local distributor is forced by the regulator to transport this electricity again at a regulated price. In other words, the last mile is therefore identical to the local distribution network. However, unlike in the telecommunications' industry, no realistic technological alternative is emerging to such distribution and therefore no technological or infrastructure competition appears possible, at least at this stage. The only feasible alternative is independent electricity production at the household level, which is still at its infancy. In short, the last mile belongs to the incumbent, who practically has no leeway to redefine it according to its commercial interests. However, there exists a broad variety of pricing schemes, such as peak load pricing or pricing according to the production method (e.g., environmentally friendly energy).

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[2] This also means different pricing schemes which affect consumer behavior. In the late 1990's the UK industry regulator claimed that the prices for calling mobile phones were too high. This triggered additional research. One of the results was that such relatively high prices stemmed from asymmetric incentives, whereby the originating party paid for all of the call. It was suggested that if instead the receiver were to pay for some or all of the call, prices of mobiles would be lower (Doyle and Smith, 1998). On the other hand, Schwarz-Schilling (2001) reports that the slower growth of mobile telephony in the US compared to other parts of the world can be attributed to the RPP principle.

In the postal sector, the concept of the last mile is used before all by analogy. Consequently, some economists have equated the postal delivery network to a physical network. Nevertheless, this is an analogy only, and in reality, the postal last mile resembles much more the current situation of the telecommunications sector than the situation of the electricity sector. It is therefore imaginable that the postal customers, as the telecommunications customers, are being offered in the future a choice as to what they would like as a "last mile", and how much they would be ready to pay for it. Inversely, the historical postal operators, like the telecommunications operators, increasingly have the option to define the kind, the quality, and the price of the last postal mile. For instance, Elsenbast (1996) reports findings from a survey, where residents could choose between payable house delivery and free collection at a centralised P.O. Box. He concluded that – not surprisingly – a majority (62%) of residents preferred house delivery but – perhaps surprisingly – would, in the average, be willing to pay for it.

## 3. THE UNIVERSAL SERVICE DELIVERY OBLIGATION

Nevertheless, so far historical postal operators have not been completely free to define what they mean by "last postal mile". As a matter of fact, and before being a technical and a commercial question, the last mile in the postal sector has mainly been a political question. We therefore also discuss how the political authorities have defined the last postal mile so far and to what extent this definition actually allows for some flexibility.

Historically, each European operator had its own definition and practice of the last postal mile. A first attempt for harmonization was undertaken by the European Commission with its Green Book in 1992. Here, the last mile falls into what is called "Universal Service". More precisely, the Universal Service has two dimensions, namely an upstream (collection) and a downstream (distribution) dimension. We are focusing here only on the downstream dimension of the Universal Postal Service, the '*Universal Delivery Service*'. At the EU level, the definition of the Universal Delivery Service is rather vague. Indeed, the Directive 97/67 states that the postal operator, which is responsible for the Universal Postal Service, must deliver postal items *"to the home premises"*. However, it does not specify a series of issues, such as the exact point of delivery, nor does it say anything about the exact time of delivery during the day, nor whether the operator may or may not charge last mile delivery fees (e.g., subscription fees to the households, specific door delivery fees).

In other words, the European Commission allows for significant leeway when it comes to downstream Universal Service obligations. It is therefore necessary to proceed to a much more systematic analysis of what Universal

Delivery Service concretely is in the different countries. This analysis shows that, while there is significant similarity when it comes to delivery frequency and quality, there remain differences when it comes to the delivery point, i.e. where the last mile ends. In fact, most of the countries do not specify the delivery point, thus implicitly assuming that the Directive 97/67 applies, meaning that delivery has to take place to the home premises. However, some countries grant exceptions, authorized generally by the regulator or even by the political authorities. Only Denmark seems to be thinking about the premises where to deliver.

In conclusion, we can see that the downstream Universal Postal Service as conceived from a political perspective remains quite vague – i.e., *"delivery to the home premises"* –, yet almost no country seems to be taking advantage of this vagueness. Switzerland appears to be unique here, inasmuch as the exceptions to such downstream Universal Service can be defined by the incumbent (i.e., neither by the political authorities nor by the regulator) in case delivery is particularly difficult.

## 4. WHO PAYS FOR DELIVERY?

Despite of a number of structural similarities, in the postal sector it is the sender pays principle (SPP)[3] that prevails, whereas the receiver pays principle (RPP) has gained widespread acceptance in other network industries.

Indeed, if we look at non-postal network industries, such as telecommunications, we observe that the dominant pricing schemes are quite different. In those network industries, technological advances and liberalization typically lead to new services, differentiated quality standards, and the unbundling of the value chain. In particular, however, we find price differentiation with two or multi-part tariff schemes. This reflects underlying demand and cost considerations: Suppliers make use of market segmentation strategies with customer preferences being better reflected in the variety of products supplied. Generally, then, the presence of high shared of fixed costs leads to some sort of fixed access fee and variable usage prices.

A brief, non-exhaustive look into the literature shows that a large number of variables influences the choice of an optimal pricing model in the telecommunications industry.[4] For instance, there are differences between

[3] The analogous term in the telecom industry is „calling party principle" CPP.

[4] The existence of a network gives rise to external effects (or network effects). Two types of externalities are "access externalities" and "call externalities". Access externalities are benefits to all members of a network when an additional user joins the network. Call externalities are the benefits a user receives from an

situations in which either party can initiate a message exchange and those in which only one party can do so. Other modeling features are for example, whether a set number of messages sent and received have the same value for the respective senders and receivers; or whether the receiver – when deciding whether to accept or not an incoming message – knows the value of the message in advance; whether sets of messages sent and received are independent of each other; whether sending a message is costly or not; or whether sender and recipient prices are set equal or unequal. Such model features have important implications on the choice of a welfare optimizing pricing model. By way of example, if an incoming message triggers an outgoing message of the same value in reply, then call externalities will be internalized in the demand of sending messages, if not, then a two-part pricing scheme might prove welfare optimizing. There are a number of papers analyziung such models; Hermlin and Katz (2004), for example, conclude that in the presence of call externalities RPP can increase welfare and profits[5].

Looking at the postal industry, we know of no system where RPP is currently in widespread use. We have to go back to the pre-Rowland-Hill-area to find RPP as a common means of payment.[6] However, the topic has been taken up again in the recent past. In 1981, Owen and Willig stated that postal rates constitute a deviation from efficient marginal cost pricing. The propose to set up a guaranteed basic service delivery and to price additional delivery services according to demand. Schwarz-Schilling, 2001, discusses an number of reasons, among them *"operational costs, transaction costs and the relevance of distributional goals"* contributing to the fact that RPP *"has never been put into practice on a significant scale so far"* (p.18). This conclusion relies on a set of theoretical considerations, yet the paper does not model or quantify costs or revenues.

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incoming message. In this paper we assume that there are both access and call externalities for recipients of postal messages.

[5] The results are, of course, subject to a number of model assumptions not discussed here. For further references see eg. Jeon, Laffont and Tirole, 2001, or Kim and Lim, 2000.

[6] See for details on postal reform introducing the sender pays principle e.g. Hill and Hill, 1880. It is interesting to note that Hill proposed that a small additional charge be made either in advance or on delivery (underscore by the authors) on the ground that in some small places the penny charge would not cover the cost of the delivery. However, he withdrew this suggestion later (Hemmeon, 1912). For a more recent discussion see e.g., Crew and Kleindorfer (1991).

To sum up, there are potentially a number of welfare arguments in favor of recipient pricing, or at least in favor *of a combination of the sender pays principle with recipient pricing*. In Section 2, we have seen that the postal sector can increasingly be compared with the telecommunications sector, and there is therefore no reason why such RPP or a combination between SPP and RPP cannot also be applied in the postal sector.

Against this background we summarize three key arguments against the SPP as it is applied in the postal industry:

- First, each network transaction implies that the message has a value for both the sender and the receiver. Efficient pricing requires, in principle, that prices equal marginal cost. Hence, both the sender and the receiver should contribute to the cost of a message.
- Secondly, a two-part tariff scheme brings prices more in line with costs. The postal network, though not a physical one, entails both fixed and variable costs. A large part of fixed costs can be associated with the delivery. Thus, introducing a fixed and a variable price component would allow for postal rates to come closer to marginal costs and thus an economically more efficient pricing.
- Thirdly, yet related to the above arguments, a receiver contribution would allow for a reduction of the sending tariffs This in turn would stimulate volumes, which in an industry with decreasing volumes would positively influence scale economies.

## 5. LAST MILE OPTIONS IN POSTAL DELIVERY

In this Section, we show possible last mile options of a historical postal operator. In doing so, we combine two dimensions, namely the point of delivery on the one hand and the payer's principle on the other.

In terms of delivery point, we have seen above that the Postal Framework Directive 97/67 remains vague, allowing for several different possible delivery points, such as the doorstep (including in an apartment building), the house entry, and the road intersection. In addition, one must also include here the delivery at the P.O. Box, even this is currently not a Universal Service option. In terms of pricing, and as we have seen above, there are the two extremes, i.e., the sender pays principle as it is currently the case in the postal sector, the receiver pays principle, or a combination of the two. Combining both, we obtain the 12 following options with their corresponding likelihood:

**Table 1: theoretically possible last mile and corresponding pricing options**

| | SPP | SPP & RPP | RPP |
|---|---|---|---|
| **PO Box** | X | | |
| **Road intersection** | | X | X |

| | | | |
|---|---|---|---|
| **House entry** | | XX | XX |
| **Doorstep** | | XXX | XXX |

Below, we will model the last mile option for a historical postal operator. However, we will be using a simplified model, whereby we will consider that the receivers pay a monthly fee for home delivery in case they do not prefer to collect their mail at the P.O. Box that is provided for free (delivery into the P.O. Box being paid for by the sender). Also, we will not make any distinction among the three possible delivery points.

## 6. MODEL AND CALIBRATION

Our aim is to evaluate whether a combination of the SPP with the RPP performs better than the SPP on its own, in terms of total welfare. We restrict ourselves to the study of the monopoly situation to reduce complexity.

Our model develops as follows. In the benchmark case, the SPP applies as it is today, thus the receiver does not pay for delivery at the doorstep. Starting from this benchmark, we select from table 1 two scenarios. We introduce the scenario "Delivery Flat Rate (DFR)", where the receivers have to pay a yearly flat rate ($P$) to the postal service, if they want delivery at the doorstep. I.e. to receive the mail at the doorstep the receiver has to pay $P$ units of money per year. Nevertheless, the customers also have the option to receive the mail for free at a P.O. Box (located at the closest post office). The policy DFR will allow the operator to reduce delivery costs and to have additional revenues (revenue associated with the flat rate customers have to pay if they choose to receive at the doorstep). We assume that the operator redistributes the additional revenues to the senders by decreasing the price accordingly.

If receivers are not willing to pay the delivery fee and choose P.O. Box delivery, it incurs an opportunity cost of going to the P.O. Box ($OC$) to collect the incoming mail. We assume $OC$ to be a function of household income $w$, the search costs $s$ to realize the opportunity income, and of time $t$, needed to go from the household's doorstep to empty the PO Box:

$$OC(w,t) = \alpha(w \cdot t)^{\beta} - s,$$

where $\alpha$ and $\beta$ expresses the way customers value the opportunity money and time. Economic theory would state these two parameters to be 1. However, many factors are not implemented in our opportunity function. For example, one could argue that the opportunity cost of going to the P.O. Box depends also on the size of the household, whether at least one member

passes the post office daily, age or health conditions of the members of the household, whether the household receives newspapers separately from the rest of the mail, or number of mail pieces per week.. It would be rather complex and arbitrary to introduce all these variables in the model. The two parameters $\alpha$ and $\beta$ give us some flexibility to get an intuitive OC-distribution that corresponds to surveys made in Germany as found in Elsenblast (1996).

The decision of the customer will depend on whether his opportunity cost of going to the P.O. Box is smaller or bigger than the flat rate he has to pay for delivery at the doorstep. If $OC \geq P$, then the customer will prefer to pay the flat rate and receive the mail at his doorstep. If $OC < P$, P.O. Box delivery is chosen.

In order to analyze the welfare effects of the new policy DFR we need to specify utility functions for senders and receivers, and a profit function for the postal service. For the sender side we follow De Donder et. al (2001) and assume a representative sender with quasilinear preferences with respect to money:

$$U^S(q,m) = aq - \frac{b}{2}q^2 + m,$$

where $q$ represents the quantity of mail sent and $m$ represents the amount of money spent on other goods. $a, b > 0$ give the market size and the slope of the demand curve, respectively. The customer has a budget constraint $p.q + m \leq \omega$, where $\omega$ is the initial endowment of the customer. The budget constraint is satisfied with equality when the customer maximizes utility. The corresponding demand function of the representative sender is as follows,

$$q(p) = \frac{1}{b}(a - p).$$

For simplify things we assume that the receivers derive a constant utility $V$ of being connected to the postal network. Thus, their (quasilinear) utility in the monopoly case is $V$. In the DFR case, they are worse of because delivery is costly now. Thus, to receive mail at the doorstep they need pay the delivery flat rate $P$, if choosing P.O. Box their cost is $OC_i$. The receivers' utility can be written as

$$U_i^R = V_i - \min(P, OC_i) \qquad (1)$$

Expression (1) offers an explanation, why so far no postal service chose DFR. If $V_i$ is smaller than the cost to receive mail, one would expect this person not to empty the P.O. Box at all. We do not implement this possibility in our model but assume that people will be motivated to empty their mail box-and no network externalities are lost. This enables us to set $V_i$ to zero for all households without changing the equilibrium outcome.

The postal services costs are composed by a variable and a fixed part, which translates the existence of economies of scale in the market. The profit function of the firm can be written as

$$\pi(\hat{p}, P) = (\hat{p} - c)q + P \cdot n(P) - F_u - \left[F_d - AC(P)\right],$$

where $c$ denotes the variable costs and $n(P)$ is the number of customers that chose delivery at the doorstep. $F_u$ and $F_d$ are the upstream and downstream fixed costs. $AC(P)$ is the avoided costs as a function of the flat rate $P$, when households do not want home delivery anymore because $P$ is too high. In the benchmark case, $P$ is zero and $AC(P) = 0$. If the flat rate were set to plus infinity in the DFR case, nobody would choose doorstep delivery and $AC(P) = F_d$. We assume that the postal services redistributes the earnings associated with the delivery pricing to the senders by lowering the stamp price from $p$ to $\hat{p}$ according to the rule $\hat{p} = p - \frac{P \cdot n(P)}{q_0}$, where $q_0$ is the mail volume of the previous period. The profit function implies that the only cost for the postal service of a P.O. Box is to sort and insert the mail into the boxes. These costs are included in $c$ and occur also for doorstep delivery. Thus, we assume that the postal service can provide additional P.O. Boxes for free and the billing costs for the monthly delivery are negligeable.

To compute overall welfare in the economy we just have to sum consumer net utility and operator's profit. For DFR, we can find the consumers' net utility by subtracting the revenues associated with the flat rate and the total disutility of going to the PO Box from the sender surplus.

With this framework, we will have a positive mail volume impact for any negative value of price elasticity. This is because we assume that the postal service redistributes the additional revenues from delivery fees and avoided costs for P.O. Box switchers to the senders by lowering the stamp price $p$ accordingly. With a negative price elasticity this leads to an increase in mail volume. Whether this translates into a higher overall welfare depends on the avoided cost function and the switching behavior of the consumers determined by the distribution of $OC$ in the population.

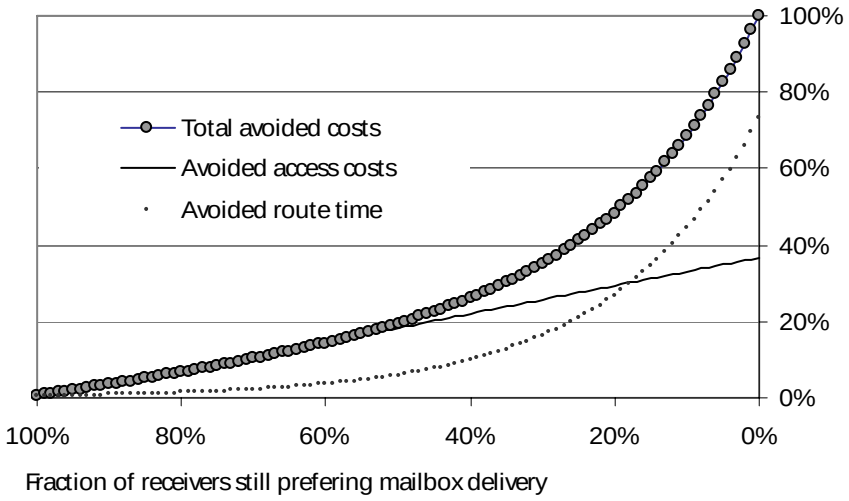
In order to assess the DFR's impact on welfare, we calibrate the model using Swiss data. Swiss Post stated in its annual report that they delivered approximately 2.8 billion pieces of addressed mail in 2004. Recent data of

Swiss Post suggest that the overall price elasticity is approximately -0.3. Parameters *a* and *b* can directly be computed using prices, quantities and price elasticities of 2004. The expression for the price elasticity is as follows

$$\varepsilon = -\frac{1}{b}\frac{p}{q}.$$

On the production side, we assume the same calibration as set out Dietl et al. (2005). A crucial point is the avoided cost function. The function reflects how delivery costs depend on the fraction of consumers choosing P.O. Box instead of mailbox. We assume a function of the following kind:

**Graph 1: Avoided Cost Function**




Total avoided costs decompose into two different parts. If a consumer switches to P.O. Box delivery, first the time is saved to reach his mailbox from the route the mail carrier passes every day. This component is a linear function. A second component is the reduced route time. Route time reduces when sufficiently persons switch to the P.O. Box, so that a mail carrier does not have to serve a whole street for example. We assume here an exponential curve.

In order to compute the opportunity cost distribution we have generated a random sample of 10'000 observations for each of the variables *w* and *t.* We assumed the households' income and distance from the P.O. Box to be

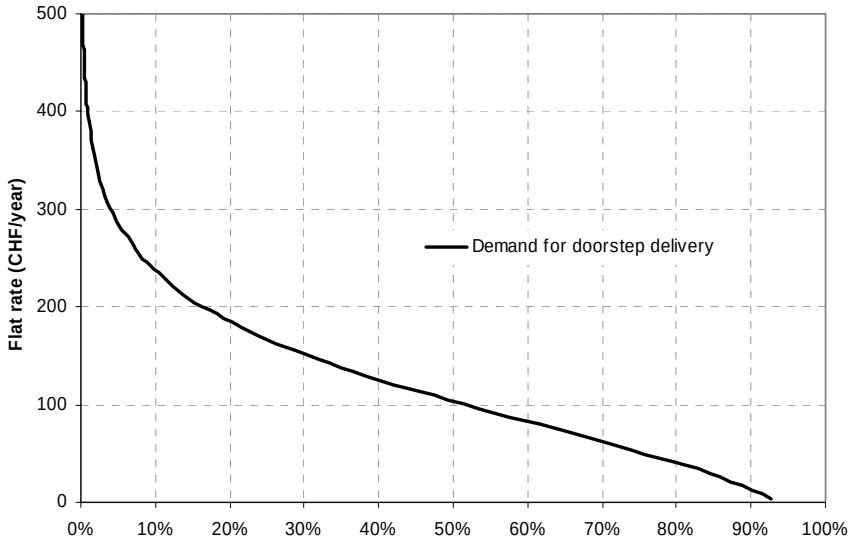
independent and to follow the lognormal distribution with the following means and standard deviations[7]:

**Table 2: Mean and standard deviation of *w* and *t***

| | Mean | Std deviation |
|---|---|---|
| *w (CHF)* | 8.933 | 3.507 |
| *t (minutes)* | 8,78 | 2,48 |

Moreover, we assumed $s$ = 150 CHF, $\alpha$ = 1 and $\beta$ to be 0,7. In Graph 2 we show the resulting demand function for doorstep delivery.

**Graph 2: Demand for doorstep delivery**




## 7. RESULTS AND DISCUSSION

We are now going to present and discuss the main conclusions of our model. We also perform some sensitivity analysis in order to test the robustness of the results.

It is straightforward to analyze the benchmark situation, i.e. the first stage before the introduction of the flat rate on doorstep delivery. The uniform price charged by Swiss Post was on average 0.74 CHF. Together with the

[7] Data supplied by the "Office Fédéral de la Statistique" and by Swiss Post.

cost structure originated a profit of 530 millions CHF (before covering the deficit in the postal outlets). The consumer's surplus is in this case approximately 3.4 billions CHF. Total welfare is approximately 3.6 billions CHF.

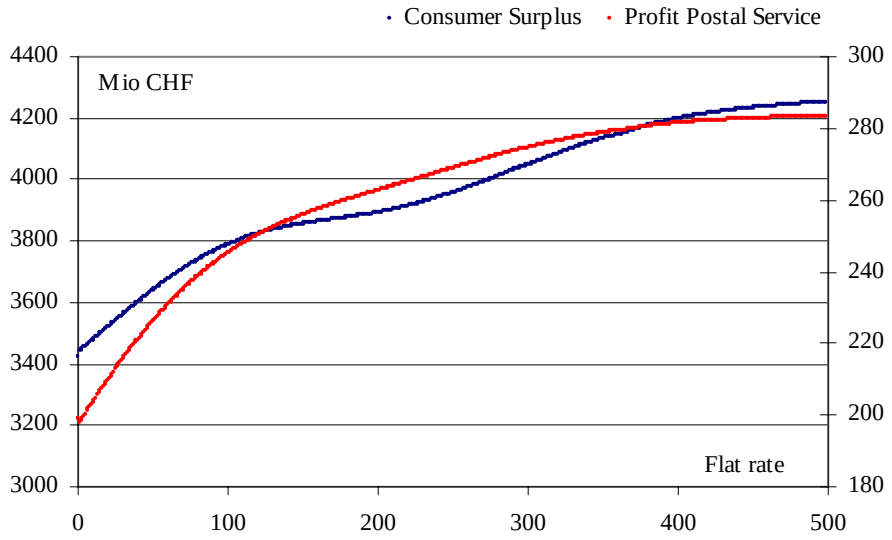
When we introduce the new policy of delivery with a delivery flat rate of 100 CHF/year the average price drops be 10 cents to 0,64 CHF because of the postal services redistribution of the flat rate to the senders. The lower price increases mail volumes, which cause an increase in the operator's profit of about 50 Mio CHF. The consumer's welfare also increases by 11%. The increase in total welfare is of approximately 12%. Table 3 summarizes the results.

**Table 3: Results for different flat rates**

| | Before flat rate | After flat rate (CHF) | | | | |
|---|---|---|---|---|---|---|
| | | **40** | **70** | **100** | **130** | **160** |
| Average price (CHF) | 0,74 | 0,69 | 0,66 | 0,64 | 0,62 | 0,61 |
| Quantity (Mio) | 2782 | 2840 | 2871 | 2895 | 2915 | 2934 |
| Consumers' surplus (mio CHF) | 3423 | 3627 | 3729 | 3804 | 3868 | 3942 |
| Firm's profit (mio CHF) | 196 | 223 | 236 | 245 | 253 | 259 |
| Total welfare (mio CHF) | 3619 | 3849 | 3965 | 4049 | 4121 | 4201 |
| Welfare change (in %) | | 0,06 | 0,10 | 0,12 | 0,14 | 0,16 |

In the graph below, we can observe how the consumers' welfare and the firm's profit evolve for different values of the flat rate.

**Graph 3: Impact of the flat rate on welfare and profit**



Assuming a flat rate of 100 Swiss Franc per year, we can see that irrespectively of $\alpha$ we will observe an increase in the total welfare with the introduction of the flat rate (Table 4). All the remaining results are robust to changes in $\alpha$.

**Table 4: Sensitivity analysis for $\alpha$**

| | Before flat rate | Flat rate = 100 CHF/year | | | | |
|---|---|---|---|---|---|---|
| | | $\alpha$ | | | | |
| | | **0.8** | **0.9** | **1** | **1.1** | **1.2** |
| Demand for doorstep delivery (%) | | 28% | 41% | 53% | 65% | 74% |
| Average price (CHF) | 0,74 | 0,63 | 0,64 | 0,64 | 0,64 | 0,64 |
| Quantity (Mio) | 2782 | 2913 | 2899 | 2895 | 2896 | 2899 |
| Consumers' surplus (mio CHF) | 3423 | 3969 | 3853 | 3804 | 3789 | 3788 |
| Firm's profit (mio CHF) | 530 | 253 | 247 | 245 | 245 | 245 |
| Total welfare (mio CHF) | 3619 | 4222 | 4100 | 4049 | 4034 | 4033 |
| Welfare change (in %) | | 0,17 | 0,13 | 0,12 | 0,11 | 0,11 |

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