

# Funding the USO: Cross-subsidization and net cost balancing

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# | Motivation

## Background

- Rather extensive universal service obligation (USO) in Switzerland
- USO net costs are computed yearly, but not compensated
- Instead: **Net Cost Balancing (NCB)** based on residual monopoly for letters below 50 grams
- Idea of NCB: Charge those products with USO net costs that can best bear them

## Research questions

- **Competitive effects** of NCB: Can NCB avoid cross-subsidization?
- **Welfare effects** of NCB: What are the differences to activity-based costing (ABC)?

**| Competitive effects of NCB**

## | Faulhaber and NCB

- Two tests:
  - i. Incremental cost test: Revenue of a service covers its incremental costs
  - ii. Standalone cost test: Revenue of a service does not exceed its standalone cost.→ Faulhaber: No cross-subsidy if at least one of the two tests is passed
- Key features of NCB:
  - Possibility of the USP to reallocate net cost of USO internally  
(Net costs are the difference in profits with and without the USO).
  - The USP can charge the services for which it is able to generate a surplus on the market and relieve unprofitable (USO) services.
  - NCB caps prices of regulated services (SMP, e.g. reserved services) such that the additional return will not exceed the net cost of the USO, i.e. the burden of the USP.
  - This interplay between the financing of the USO and price regulation facilitates providing universal services without external financing.

## | Competitive effects of NCB

- a. Compared to external funding of USO net costs, the USP is strictly worse off under NCB (“no funding”)
  - Price increases are mirrored by price decreases
  - Some positive dynamic effects (if net costs are allocated to products with comparably lower price elasticities), however these effects are strictly lower than full external funding of net costs
  - USO remains “under-funded”
- b. NCB imposes a strict upper pricing limit for regulated services with market power (e.g. reserved services)
  - Unlikely that capped revenues exceed standalone costs
- c. If the cost of services outside the USO after NCB payments do not exceed their incremental costs, then the Faulhaber incremental cost test is not passed for these services.

## Discussion

- In general, the Faulhaber rule will be fulfilled under NCB because of b)
- If competitive concerns related to c) are considered more important than public policy objectives related to financing the USO, then general competition law should apply services outside the USO.
- Such a regulatory setting would be stricter than the Faulhaber rule. In either case, a) still holds, i.e. the USP is systematically under-funded with NCB.
- We conclude that NCB is at least as strict as the standard Faulhaber (1975) rule. If general competition law applies to non-universal services, NCB can be considered stricter (and putting the USP at a net disadvantage).
- NCB can therefore be seen as an implementation of the Faulhaber rule. The main reason is that NCB restricts pricing of SMP USO services in a coherent way.

**Welfare effects of NCB**

# | Approach

## 1. Model with formal analysis

- Profit functions differentiate product-specific variable cost  $c_i$ , product-specific fixed cost  $F_i$  and common fixed cost  $F_g$
- Faulhaber rule as a constraint; incremental cost must be covered
- Rate of return price regulation

## 2. Quantitative analysis based on stylized calibration of model

- Application of model
- Calibration to stylized postal incumbent / market
- Two products  $H$  and  $L$ :  
One with high price elasticity, one with low elasticity
- Linear demand



## Benchmark: Welfare maximizing Ramsey Pricing (RP)

- Welfare maximization (benchmark)
- Incremental cost charged to products
- Common cost is freely allocated to maximize welfare
- Break-even constraint requires markup on marginal cost
- Ramsey based prices minimizing the deadweight losses

$$\max_{p_i} W$$

s. t.

$$\beta \sum_i p_i x_i(p_i) \geq \pi$$

Global rate of return constraint

$$p_i \geq c_i$$

Prohibition of cross-subsidies

## | Activity based costing (ABC)

- Incremental costs charged to products
- Common cost  $F_g$  (which can also be interpreted as net costs) allocated according to objective criteria (here: based on volume)
- Recommended by ERGP, implemented in the EC Directive

$$\max_{p_i} \pi$$

s. t.

$$(1 - \beta)p_i x_i(p_i) \leq C_i(x_i(p_i)) + F_i + \frac{x_i(p_i)}{\sum_i x_i(p_i)} F_g$$

Rate of return constraint

$$p_i \geq c_i$$

Prohibition of cross-subsidies

## Net cost balancing (NCB)

- Incremental cost charged to products
  - A part of common cost (not exceeding the net cost of the USO) may be freely allocated
- Stylized version as implemented in Switzerland

$$\max_{p_i, \alpha_i} \pi$$

s. t.

$$(1 - \beta)p_i x_i(p_i) \leq C_i(x_i(p_i)) + F_i + \alpha_i F_g \quad \text{Rate of return constraint}$$

$$\sum_{i \in I} \alpha_i = 1 \quad \left. \vphantom{\sum_{i \in I} \alpha_i = 1} \right\} \text{Rebalancing constraint}$$

$$0 \leq \alpha_i \leq 1$$

$$p_i \geq c_i \quad \text{Prohibition of cross-subsidies}$$

## | Formal results

- With all mechanisms, optimal prices depend (negatively) on demand elasticity
- Intuition: Under rate of return regulation, an increase in revenue increases absolute profits
- Not possible to make a statement whether NCB or ABC is superior in terms of welfare

# Quantitative results (1)

## Results base case

	RP	Monopoly	NCB	ABC	Elasticity at RP prices
Price (elasticity H)	0.87	1.08	0.89	1.14	-1.09
Price (elasticity L)	1.27	1.75	1.25	1.09	-0.73
Welfare	1'227	646	1'226	1'123	

Highest welfare with restricted rate of return and price differentiation

Excessive price differentiation and markup in unconstrained monopoly results in welfare loss

NCB almost achieves Ramsey second best

# Quantitative results (2)

Sensitivity analysis regarding amount of the net cost  $F_g$  and elasticity  $\epsilon_h$

$F_g$ (Mio.) \ Elasticity	-0.75	-1.00	-1.25	-1.50	-2.00
150	6.3	9.4	11.3	12.5	14.1
250	20.0	30.0	36.1	40.1	45.1
500	30.9	58.6	70.3	78.1	87.9

## Robustness of results

Welfare Differential NCB-ABC (%)

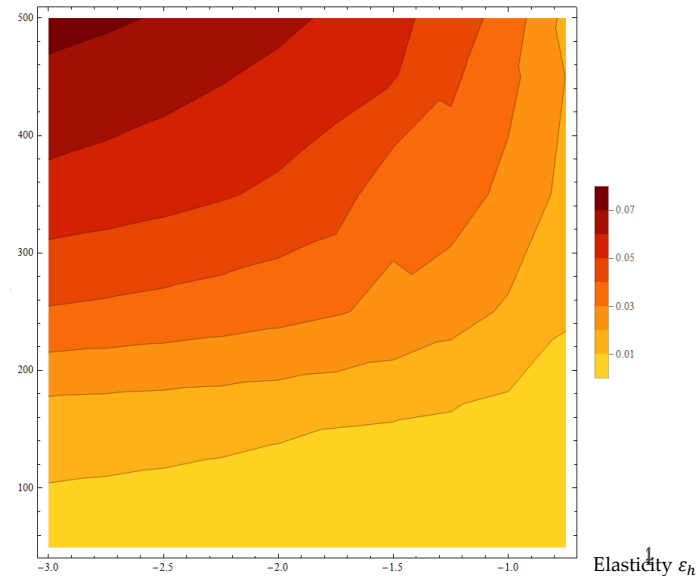
Mean	Median	Min	Max
3.16%	2.95%	0.01%	8.16%

### Summary:

Welfare difference between NCB and ABC is large if

- Difference in elasticities is high
- Net cost is high

$F_g$  Net costs



**| Conclusions**

# Conclusion

## Competitive effects of NCB

- As strict or stricter than Faulhaber
- Does not compensate the USO net burden, i.e. not a financing instrument in itself

## Welfare effects of NCB as opposed to activity-based costing (ABC)

- Cost allocation rules strongly affect prices and welfare under price control
- Net cost balancing
  - allows the USP operator to set market-oriented prices
  - is superior to pure ABC costing in terms of welfare
  - reduces compensation need for USP



**Thank you!**

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# Backup 3D Plot

