swiss economics

University of St.Gallen

Compensating the Net Cost of Universal Postal Services

Christian Jaag, Swiss Economics and University of St. Gallen

Sixth Conference on Regulation, Competition and Universal Service in the Postal Sector
Toulouse, March 25, 2010

Agenda

- Introduction
- Related literature
- The model
- Four notions of unfairness
- Conclusion

Introduction: USO costing and financing

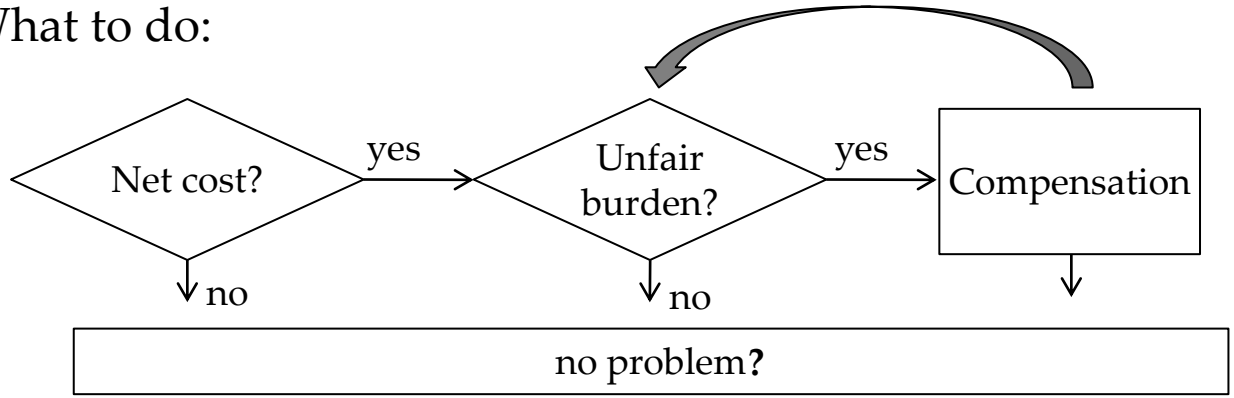
"Where a Member State determines that the universal service obligations […] entail a **net cost** […] and represent an **unfair financial burden** on the universal service provider(s), it may introduce:

(a) a mechanism to compensate the undertaking(s) concerned from public funds; or

(b) a mechanism for the sharing of the net cost of the universal service obligations between providers of services and/or users."

Article 7 of the third postal EC Directive

What to do:



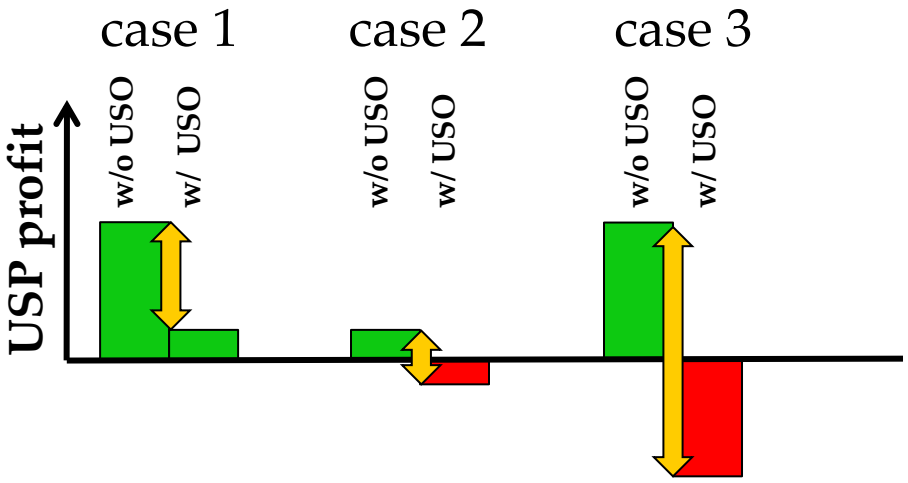
Contribution of this paper:
Notions of unfairness and how financing mechanisms interfere

Related literature

- Profitability cost:
  Panzar (2000), Cremer et al. (2000)
- Practical implementations:
  e.g. Copenhagen Economics (2008), Bergum (2008), Frontier Economics (2008), Cohen et al. (2010)
- Endogenous market structure:
  Jaag et al. (2009), Boldron et al. (2009)
- Net cost vs. unfair burden:
  Boldron et al. (2009), De Donder et al. (2010)

What amount of net cost represents unfair burden? (I)

- De Donder et al (2010): Market outcome with USO where USP does not break even.
- CERP: Fundamental deviation from reference scenario; current service level must not exceed requirements of the USO.
- In which case is there an unfair burden?



De Donder et al. (2009)	no	yes	yes
CERP	yes	no	yes

What amount of net cost represents an unfair burden? (II)

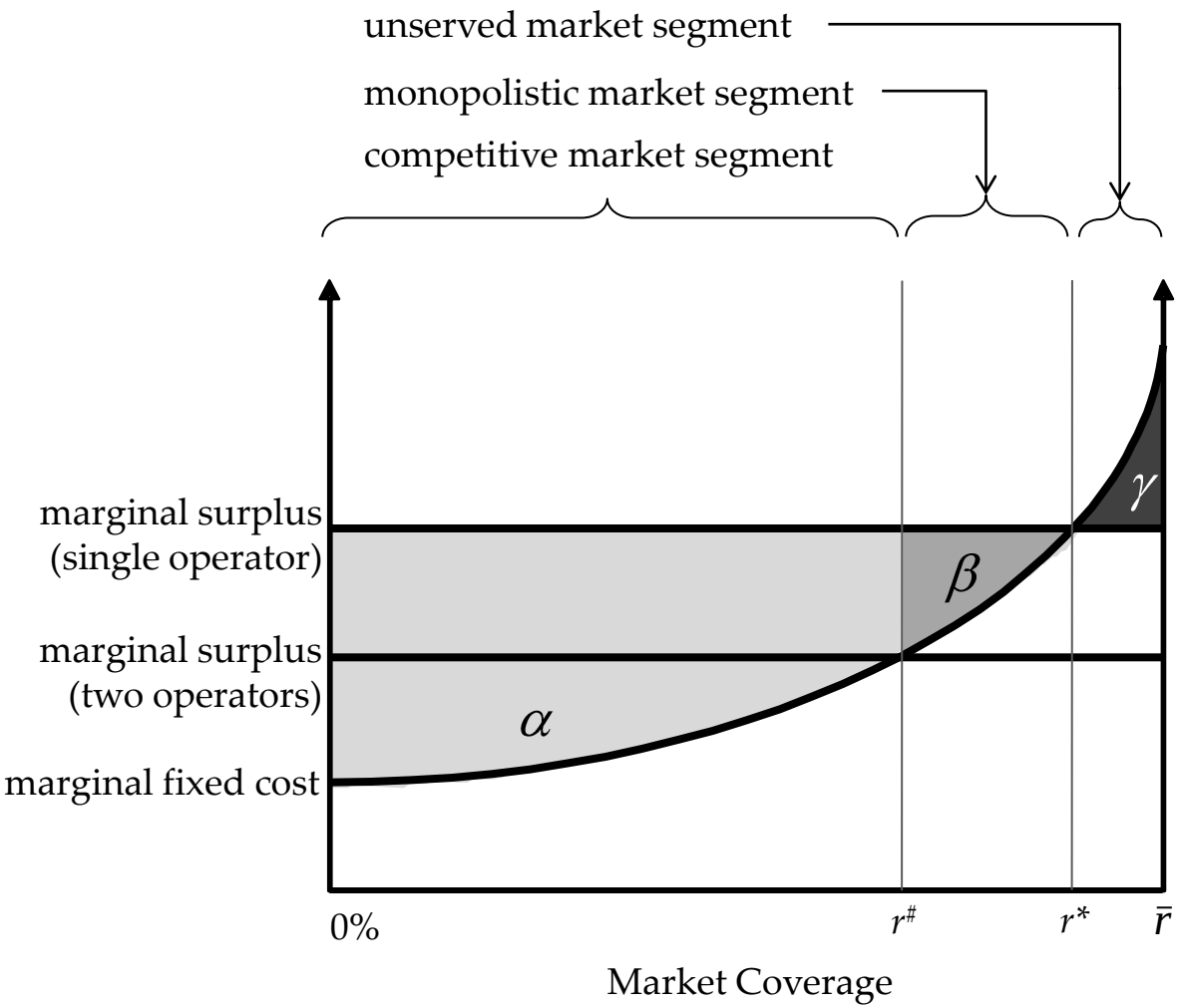
1. **Ex ante perspective**
   (before implementation of financing mechanism):
   What is the criterion for implementing a compensation or cost sharing mechanism? – as in CERP and De Donder et al. (2010)

2. **Ex post perspective**
   (after implementation of financing mechanism)
   What is the appropriate compensation such that there is no remaining unfair burden?

The model I

- **Two postal operators:** Incumbent, competitor
- **One aggregate mail category per operator (imperfect substitutes)**
- **Continuum of (regionally) different mail markets which are independent of each other**
- **Assumption on the sequence of decisions:**
  1. Incumbent chooses market coverage
  2. Competitor chooses market coverage
  3. Price competition
- **Operators' cost structures and qualities are symmetric**
- **One-dimensional USO:** Delivery coverage

The model II



USP profit:

$\alpha+\beta+\gamma$

competitor profit:

α

USO net cost :

$-\gamma$

Three potential financing mechanisms

1. **Public funds / external financing**

   General government budget

   $\tau_e^{ext} = \tau_i^{ext} = 0$

2. **USO fund**

   Uniform profit tax on all operators

   $\tau_e^{fund} = \tau_i^{fund}$ $\rightarrow$ tax base is $2\alpha + \beta + \gamma$

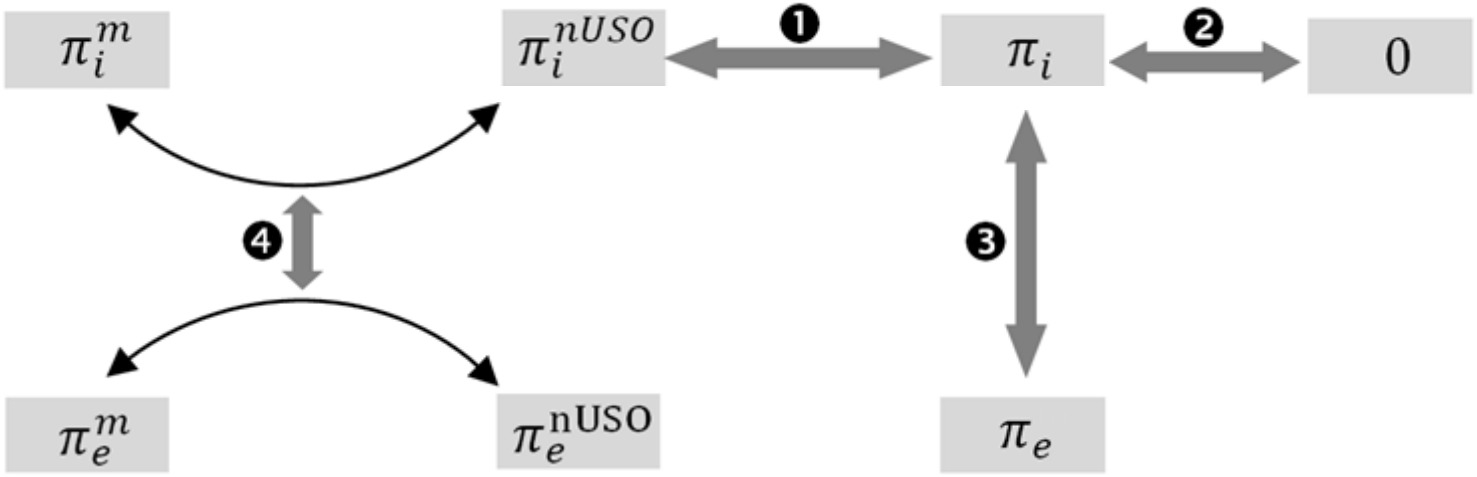
3. **Pay or play mechanism**

   Profit tax on the competitor only

   $\tau_e^{pop} \neq \tau_i^{pop} = 0$ $\rightarrow$ tax base is α

Four notions of unfairness

Profit w/ USO, w/ comp. **Profit w/o USO** **Profit w/ USO, w/o comp.**



❶ Absolute net cost level

❷ Absolute profit level

❸ Absolute difference to competitor's profit

❹ Relative difference to competitor's profit

Notions of unfairness

Criterion 1: Absolute net cost level

According to criterion 1, universal service provision imposes an unfair burden if it reduces the USP's profit compared to a situation without USO (by a at least certain amount). – cf. CERP

Ex ante perspective: $\pi_i + T^m = \pi_i^{nUSO}$

- Pay or play $\tau^{pop,ea}\alpha = -\gamma$
- Fund $\tau^{fund,ea}[2\alpha + \beta + \gamma] = -\gamma$

Ex post perspective: $\pi_i^m = \pi_i^{nUSO}$

- Pay or play $\alpha + \beta + \gamma + \tau^{pop,ep}\alpha = \alpha + \beta$
- Fund $\left(1 - \tau^{fund,ep}\right)[\alpha + \beta + \gamma] + \tau^{fund,ep}[2\alpha + \beta + \gamma] = \alpha + \beta$

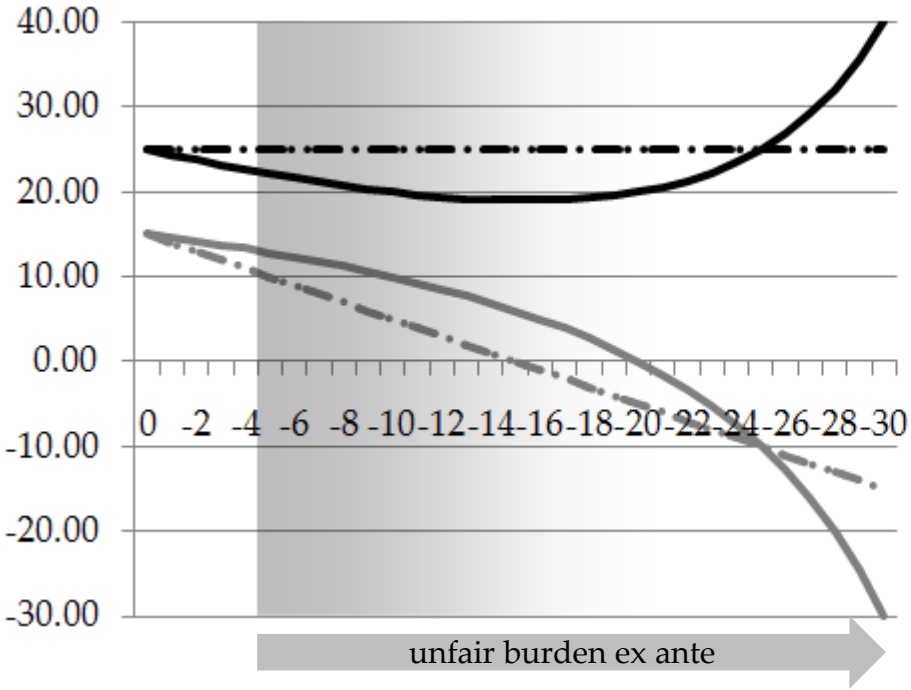
Criterion 1: Absolute net cost level

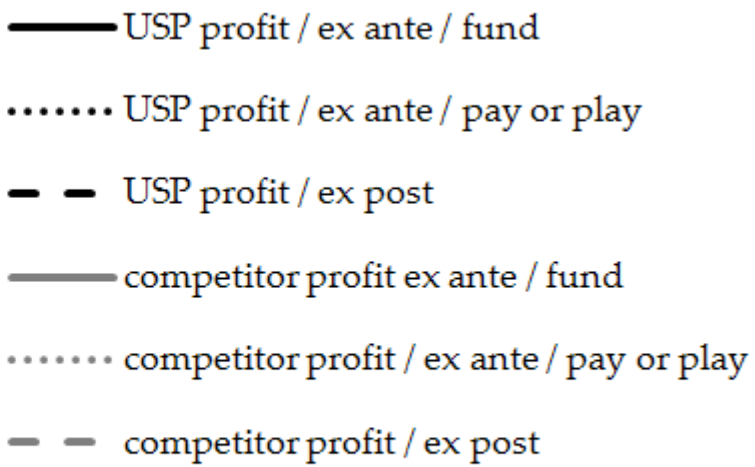
Distribution of profits after compensation

m	USP profit π_i^m	Competitor profit π_e^m
ext	$\alpha + \beta$	α
pop ex ante	$\alpha + \beta$	$\alpha + \gamma$
fund ex ante	$\alpha + \beta + \frac{\gamma(\alpha + \beta + \gamma)}{2\alpha + \beta + \gamma}$	$\alpha + \frac{\gamma\alpha}{2\alpha + \beta + \gamma}$
pop ex post	$\alpha + \beta$	$\alpha + \gamma$
fund ex post	$\alpha + \beta$	$\alpha + \gamma$

Criterion 1: Absolute net cost level

Distribution of profits after compensation





$\alpha = 15, \beta = 10, \gamma \epsilon [0, -30]$

Issues:

- What ist the correct threshold for the introduction of a compensation?
- Incentive problem with ex ante compensation through a fund

Notions of unfairness

Criterion 2: Absolute profit level

According to criterion 2, universal service provision imposes an unfair burden if the USP's profit is negative. – cf. De Donder et al (2010)

Ex ante perspective: $\pi_i + T^m = 0$

- Pay or play $\tau^{pop,ea}\alpha = -(\alpha + \beta + \gamma)$
- Fund $\tau^{fund,ea}[2\alpha + \beta + \gamma] = -(\alpha + \beta + \gamma)$

Ex post perspective: $\pi_i^m = 0$

- Pay or play $\alpha + \beta + \gamma + \tau^{pop,ep}\alpha = 0$
- Fund $(1 - \tau^{fund,ep})[\alpha + \beta + \gamma] + \tau^{fund,ep}[2\alpha + \beta + \gamma] = 0$

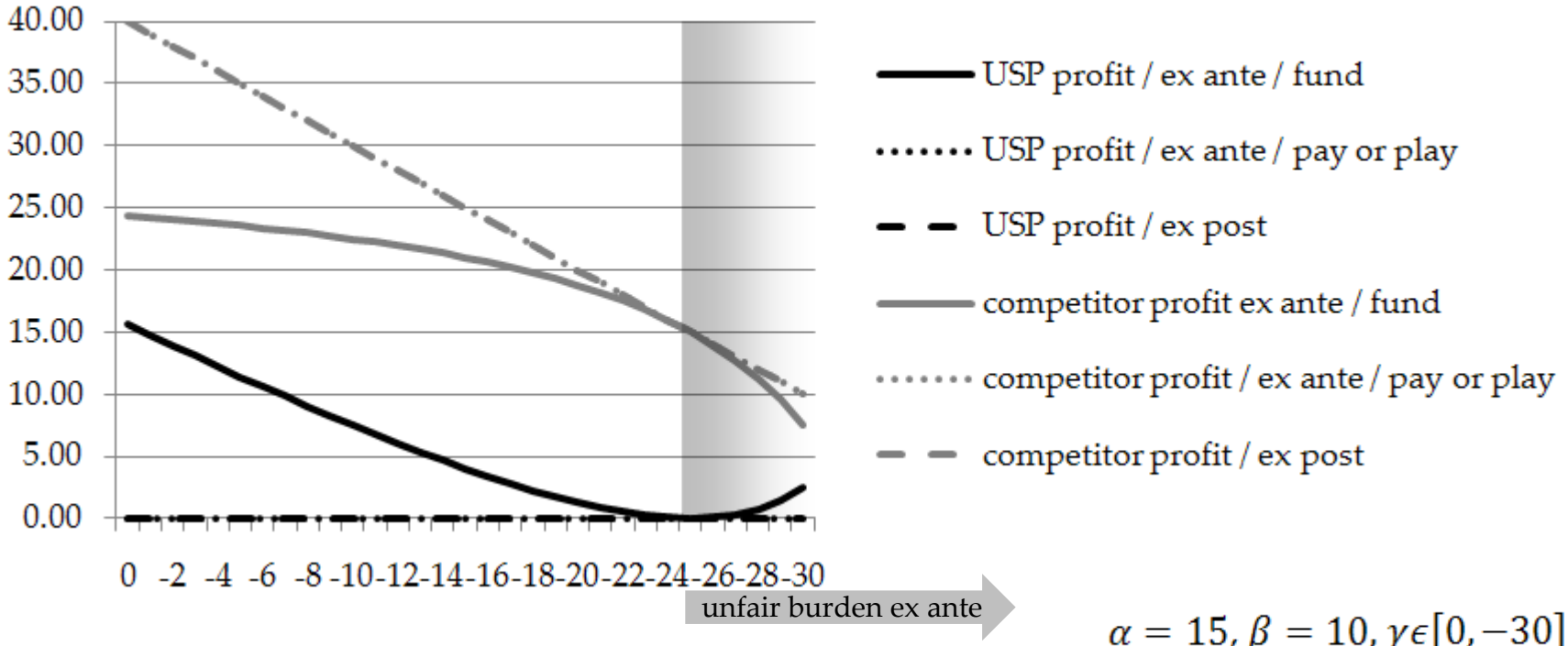
Criterion 2: Absolute profit level

Distribution of profits after compensation

m	USP profit π_i^m	Competitor profit π_e^m
ext	0	α
pop ex ante	0	$2\alpha + \beta + \gamma$
fund ex ante	$\frac{(\alpha + \beta + \gamma)^2}{2\alpha + \beta + \gamma}$	$\alpha + \frac{\alpha(\alpha + \beta + \gamma)}{2\alpha + \beta + \gamma}$
pop ex post	0	$2\alpha + \beta + \gamma$
fund ex post	0	$2\alpha + \beta + \gamma$

Criterion 2: Absolute profit level

Distribution of profits after compensation



$\alpha = 15, \beta = 10, \gamma \epsilon [0, -30]$

Issues:

- Why calculate the USO net cost in the first place?
- Which is the relevant business unit to which the break-even constraint applies?

Notions of unfairness

Criterion 3: Absolute difference to competitor's profit

According to criterion 3, universal service provision imposes an unfair burden if the USP's profit is lower than the competitor's profit.

Ex ante perspective: $\pi_i + T^m = \pi_e$

- Pay or play $\tau^{pop,ea}\alpha = -(\beta + \gamma)$
- Fund $\tau^{fund,ea}[2\alpha + \beta + \gamma] = -(\beta + \gamma)$

Ex post perspective: $\pi_i^m = \pi_e^m$

- Pay or play $\alpha + \beta + \gamma + \tau^{pop,ep}\alpha = \left(1 - \tau^{pop,ep}\right)\alpha$
- Fund $\left(1 - \tau^{fund,ep}\right)[\alpha + \beta + \gamma] + \tau^{fund,ep}[2\alpha + \beta + \gamma] = \left(1 - \tau^{pop,ep}\right)\alpha$

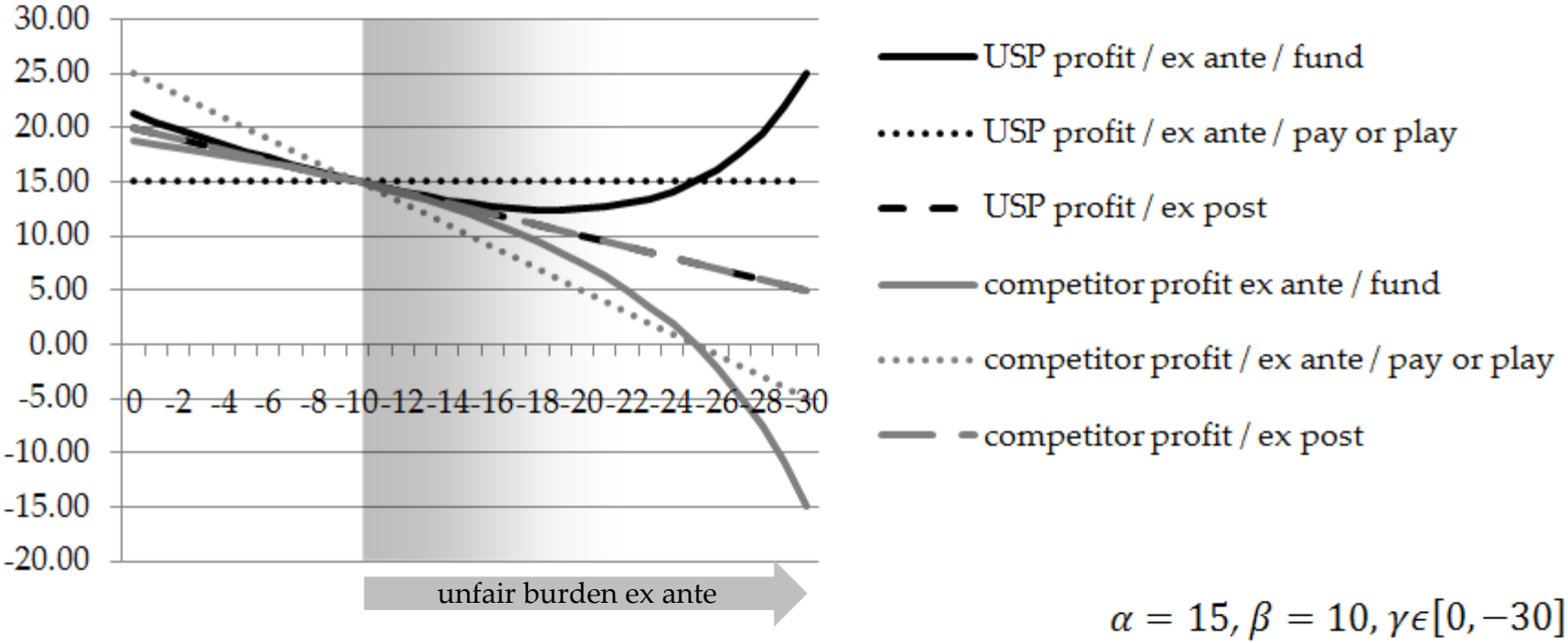
Criterion 3: Absolute difference to competitor's profit

Distribution of profits after compensation

m	USP profit π_i^m	Competitor profit π_e^m
ext	α	α
pop ex ante	α	$\alpha + \beta + \gamma$
fund ex ante	$\alpha + \frac{(\beta + \gamma)(\alpha + \beta + \gamma)}{2\alpha + \beta + \gamma}$	$\alpha + \frac{\alpha(\beta + \gamma)}{2\alpha + \beta + \gamma}$
pop ex post	$\alpha + 0.5(\beta + \gamma)$	$\alpha + 0.5(\beta + \gamma)$
fund ex post	$\alpha + 0.5(\beta + \gamma)$	$\alpha + 0.5(\beta + \gamma)$

Criterion 3: Absolute difference to competitor's profit

Distribution of profits after compensation



$\alpha = 15, \beta = 10, \gamma \epsilon [0, -30]$

Issues:

- Implicit competitor profit regulation
- Incentive problem is extended to competitor

Notions of unfairness

Criterion 4: Relative difference to competitor's profit

According to criterion 4, universal service provision imposes an unfair burden if it reduces the USP's profit compared to a situation without USO by more than the competitor's profit is reduced due to its contribution to USO funding.

Ex ante perspective $\pi_i + T^m = \pi_i^{nUSO}$

Ex post perspective:

- 4a $\pi_i^{nUSO} - \pi_i^m = \pi_e^{nUSO} - \pi_e^m$

- 4b $\frac{\pi_i^{nUSO}}{\pi_i^m} = \frac{\pi_e^{nUSO}}{\pi_e^m}$

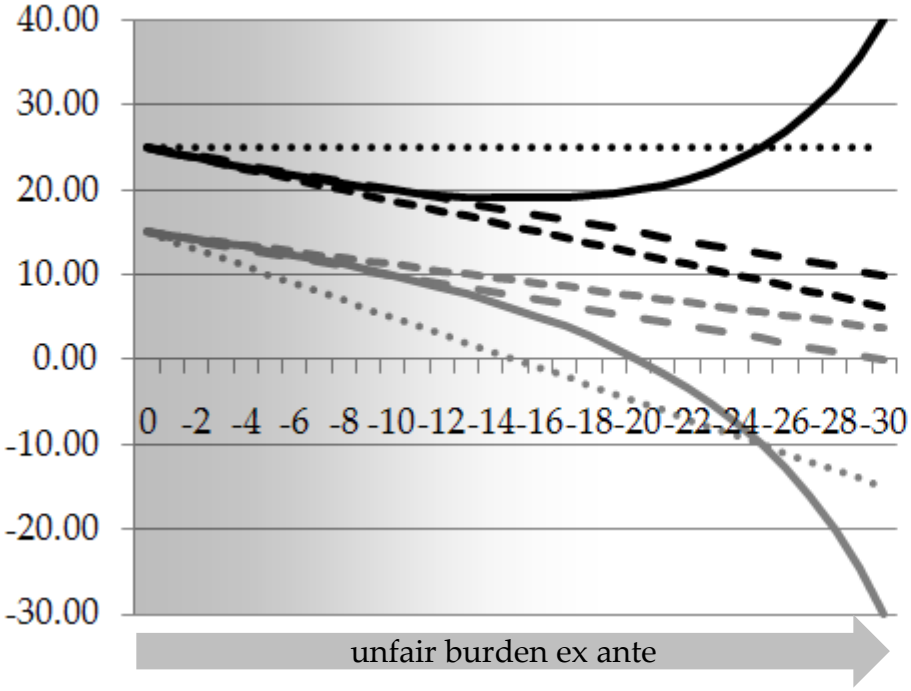
Criterion 4: Relative difference to competitor's profit

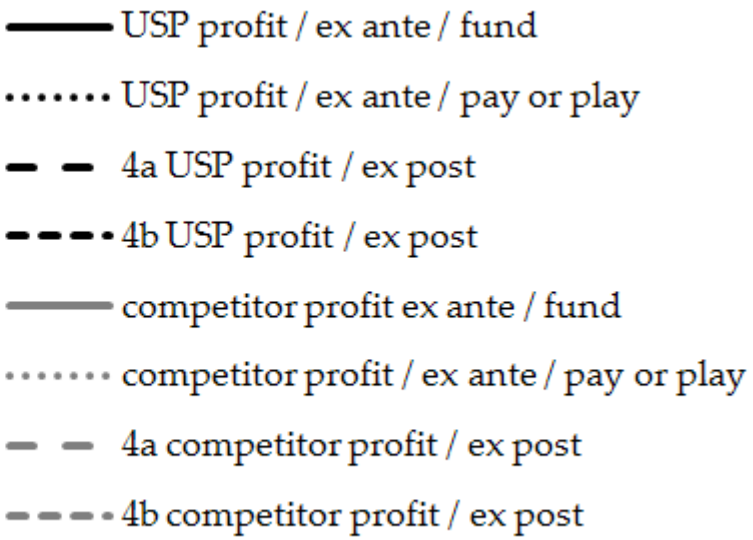
Distribution of profits after compensation

m	USP profit π_i^m	Competitor profit π_e^m
ext	$\alpha + \beta$	α
pop ex ante	$\alpha + \beta$	$\alpha + \gamma$
fund ex ante	$\alpha + \beta + \frac{\gamma(\alpha + \beta + \gamma)}{2\alpha + \beta + \gamma}$	$\alpha + \frac{\gamma\alpha}{2\alpha + \beta + \gamma}$
a) pop ex post	$\alpha + \beta + 0.5\gamma$	$\alpha + 0.5\gamma$
a) fund ex post	$\alpha + \beta + 0.5\gamma$	$\alpha + 0.5\gamma$
b) pop ex post	$\alpha + \beta + \gamma - \frac{\alpha\gamma}{2\alpha + \beta}$	$\alpha + \frac{\alpha\gamma}{2\alpha + \beta}$
b) fund ex post	$\alpha + \beta + \gamma - \frac{\alpha\gamma}{2\alpha + \beta}$	$\alpha + \frac{\alpha\gamma}{2\alpha + \beta}$

Criterion 4: Relative difference to competitor's profit

Distribution of profits after compensation





$\alpha = 15, \beta = 10, \gamma \epsilon [0, -30]$

Issues:

- Again: Incentive problems
- Complexity (also competitor's counterfactual profit needed)

Conclusions

1. A priori, no criterion for unfairness is “simply the best”.
2. It is important to differentiate between the two perspectives “ex ante” and “ex post”.
3. Only a compensation with government funds yields robust results under all criteria.
4. With a fund to which all operators contribute, there is a systematic bias in the compensation of the USP.
5. Issues for further research:
   - Extension (fully fledged USO, asymmetric operators, contributions based on turnover or per unit)
   - Implementation

swiss economics

Thank you.

Christian Jaag, PhD
christian.jaag@swiss-economics.ch

Swiss Economics
Abeggweg 15
CH-8057 Zürich
Switzerland
www.swiss-economics.ch