

Multi-National Policies for the USO in the Postal Sector under Entry

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Summary

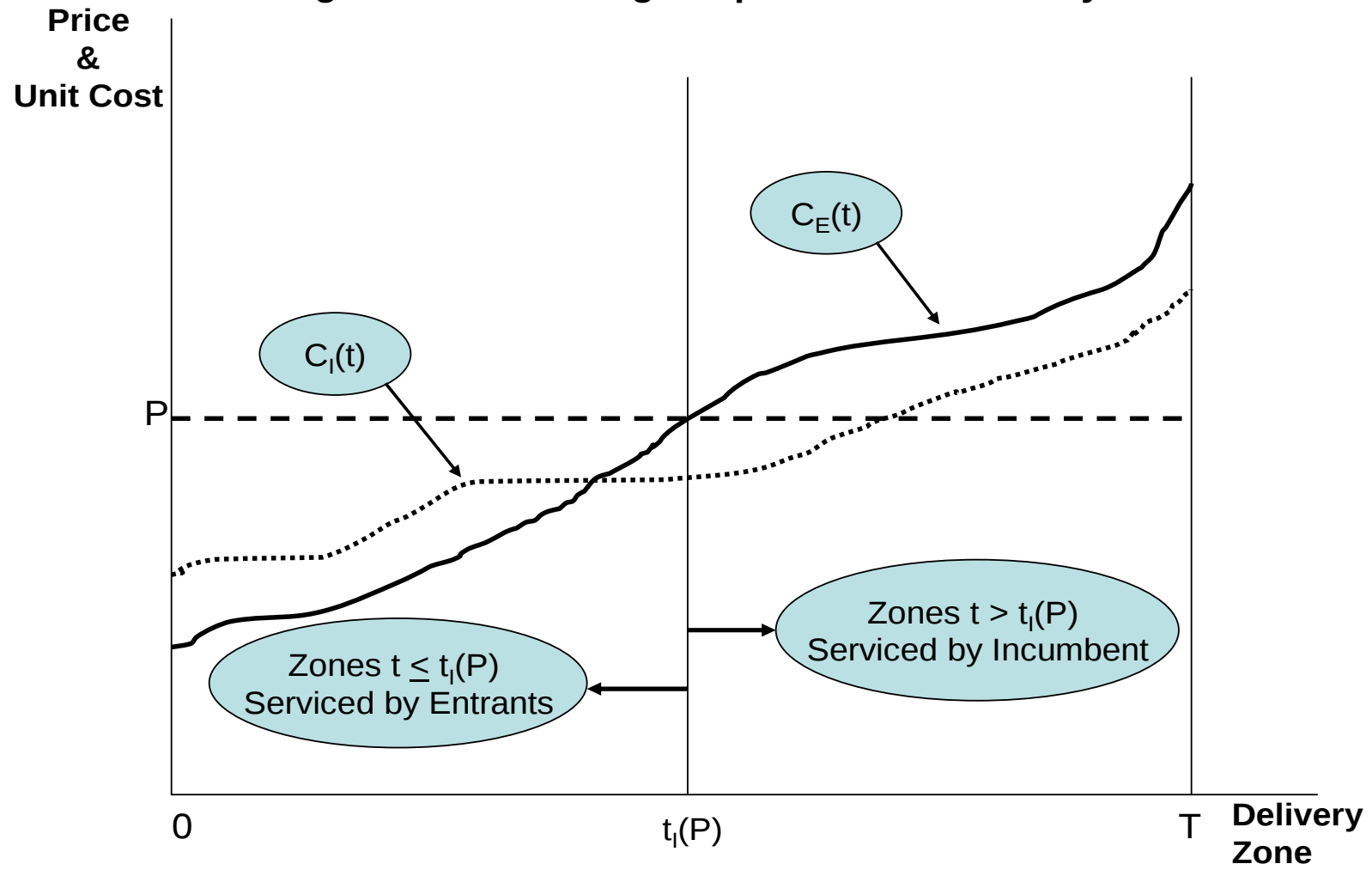
- A model of a single country USO under entry
- A model of regional USO regulation across several countries
- Some thoughts on current policy issues in the European Union debate on USO

USO Model for Single Country

Crew-Kleindorfer, JRE, 1998

- Universal Service Provider (USP) faced with entry, required to provide a USO with uniform pricing, affordability and counter accessibility restrictions.
- $C_I(t)$, $C_E(t)$ represent full cost of End-to-End service for Incumbent and Entrant(s) for zone $t \in T$.
- $D(t)$ is demand in zone $t \in T$, assumed inelastic, with reservation price $v > 0$ per unit.\
- Transactions costs for customers and fixed costs of USO for the USP depend on density of counters

Figure 1: Illustrating Scope of USO and Entry



Consequences of USO Accessibility Requirement

- USP Fixed Costs: $F(u) = u \int_0^T D(t) dt$
- Transactions Costs: $A(u) = \frac{K}{u \int_0^T D(t) dt}$

Entry and Breakeven Constraints

$$C_E(t_I) = P \Rightarrow t_I(P) = C_E^{-1}(P)$$

$$\Pi(P, u) = \int_{t_I(P)}^T (P - C_I(t))D(t)dt - F(u) = 0$$

Welfare Function

$$\begin{aligned} W(P, u) = & v \int_0^T D(t) dt \\ & - \int_0^{t_I(P)} C_E(t) D(t) dt - \int_{t_I(P)}^T C_I(t) D(t) dt \\ & - F(u) - A(u) \end{aligned}$$

First-Best Solution (P^W, u^W)

$$t_I(P^W) = t^* \text{ so that } C_E(t_I(P^W)) = C_I(t_I(P^W))$$

$$u^W = \frac{\sqrt{K}}{V} = \arg \min [F(u) + A(u) \mid u \in U]$$

Note that USP does not breakeven at this solution.

Proposition 1: Consider the Ramsey problem:

$$(*) \text{Max} \langle W(P, u) \mid \Pi(P, u) \geq 0, P \geq 0, u \geq 0 \rangle$$

Define : $\bar{u} = \Pi^* / V$, where $\Pi^* = \text{Max} \langle \Pi(P, 0) \mid P \geq 0 \rangle$
 and $V = \int_0^T D(t)dt$ is total volume, and assume that $\Pi^* > 0$.

Then $W(P, u)$ is well defined and continuous on $U = [0, \bar{u}]$.

Moreover, a solution (P^*, u^*) to $(*)$ exists and satisfies:

- (i) $u^* \in U$
- (ii) $u^* \leq \text{Min} \left[\frac{\sqrt{K}}{V}, \frac{\Pi^*}{V} \right] \leq u^W$
- (iii) $\Pi(P^*, u^*) = 0; P^* > P^W$

First-Best
Solution
 (P^W, u^W)

Multi-national USO

N countries ($i \in N$)

USP faces constraints $x \in \Gamma_i(u)$ on profit making activities induced by the USO, whose scope is denoted $u \in U \subset \mathfrak{R}$:

$$\pi_i(u) = \text{Max} \langle \Pi_i(x, u) \mid x \in \Gamma_i(u) \rangle$$

$$[u \leq u'] \Rightarrow [\Gamma_i(u) \supseteq \Gamma_i(u')], \forall u, u' \in U$$

Consequently, $\pi_i(u)$ is non-increasing in $u \in U$.

Some Assumptions

- **A1:** (Minimal Response by USP_i): For any given regional standard $u \in U$ for the USO, the implemented standard in country $u_i \in U$ will be $u_i = \max [u, u_{i0}]$, where u_{i0} is the “historical” USO in country $i \in N$.
- **A2:** (Unimodal welfare function): Define the derived welfare function $w_i(u) = W_i(x_i(u), u)$, where $x_i(u)$ is the profit-maximizing choice of the USP subject to $x_i \in \Gamma_i(u)$. Assume that $w_i(u)$ is unimodal.

Multi-National USO Design Problem

From A1, if a regional USO of $u \in U$ is chosen, then $u_i = \max [u, u_{i0}]$ will be implemented in country i , leading to aggregate welfare of $w_i(\max [u, u_{i0}])$. The multi-national USO design problem is therefore:

$$\text{Max} \left\langle \sum_{i \in N} w_i(\max[u, u_{i0}]) \mid u \in U \right\rangle$$

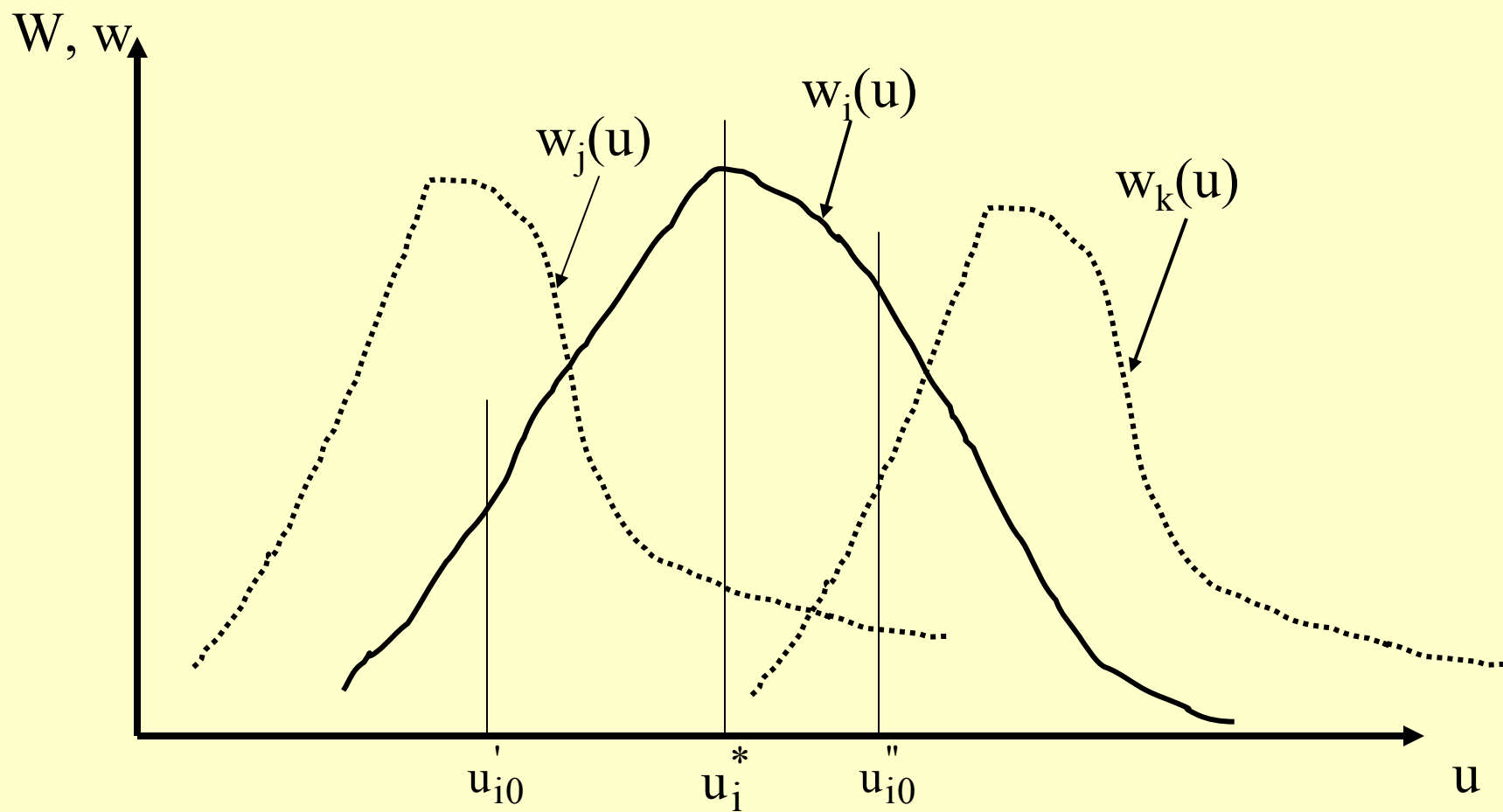
Welfare-Optimal Multi-national USO Policy

Define $u_i^* = \arg \max \{w_i(u) \mid u \in U\} = \arg \max \{w_i(u) \mid u \in U, u \geq u_{i0}\}$

Proposition 2: Without loss of generality, assume that countries are ordered so that $u_{10} \leq u_{20} \leq \dots \leq u_{n0}$. Supposing A1 and A2 to hold, a solution $u^* \in U$ to the USO design problem exists. Moreover, defining $\underline{N} = \{k \in N \mid u_{i0} < u_i^*\}$:

- (i) If $\underline{N} = \emptyset$, then any regional USO, $u^* \in U$ satisfying $u^* \leq u_{10} = \min \{u_{10}, \dots, u_{n0}\}$ is optimal (i.e., subsidiary dominates);
- (ii) If $\underline{N} \neq \emptyset$, let $k = \max \{i \mid i \in \underline{N}\}$; there exists an optimal regional USO, $u^* \in U$ satisfying $u^* \leq u_k^*$.

Logic of the Proposition



Some Complications

- Informational issues: Interesting economic design problem arises if subsidiary does not dominate. A standard mechanism design problem obtains in this case associated with simultaneously determining the optimal USO and the country-specific welfare consequences of the USO.
- We have neglected profit consequences for the USP in our design problem. These can be appended to our full information design problem without any difficulty. Just substitute: $u_{i0} = \text{Min} [u_{i0}, u_0(\Pi_i = 0)]$ but here the informational and strategic problems are likely to be significant.

Example of Multi-national USO Regulation

Postal Reform Article 12 EU Postal Directive 97/67/EC (the USO)

**USO = Ubiquitous Service at a Uniform and Affordable Price,
and with some understood uniformity in service quality**

“Member States shall take steps to ensure that the tariffs for each of the services forming part of the provision of the Universal Service comply with the following principles:

- prices must be affordable and must be such that all users have access to the services provided,
- prices must be geared to cost; Member States may decide that a uniform tariff should be applied throughout their national territory
- the application of a uniform tariff does not exclude the right of the universal service provider(s) to conclude individual agreements on prices with customers,
- tariffs must be transparent and non-discriminatory”

USO at Center of EU Liberalization Debate

USER – Level of service and USO in the market

- Substitutes and changing habits: needs
- Market provided services
- Scope of USO needed



PROVIDER – strategy for providing USO

- Commercial freedom
- Commercial operations
- Competitive attitude
- Efficiency (cost, quality,...)

REGULATOR – regulatory policies & strategies

- National vs. European level
- Access conditions
- Quality of service levels
- Social requirements (choice, ...)

USO: Uniformity of Tariffs and Service Levels

Tariffs

- USO tariff uniformity, and access conditions to the PPN, are the key drivers of USP vulnerability to entry.
- Managing non-uniform tariffs for (single piece) lettermail induces important transactions and operating costs. Even without constraint, lettermail tariffs are likely to remain uniform.
- Business mail likely to be freed of uniformity constraints, except those related to non-discriminatory treatment for dominant providers.

Service levels

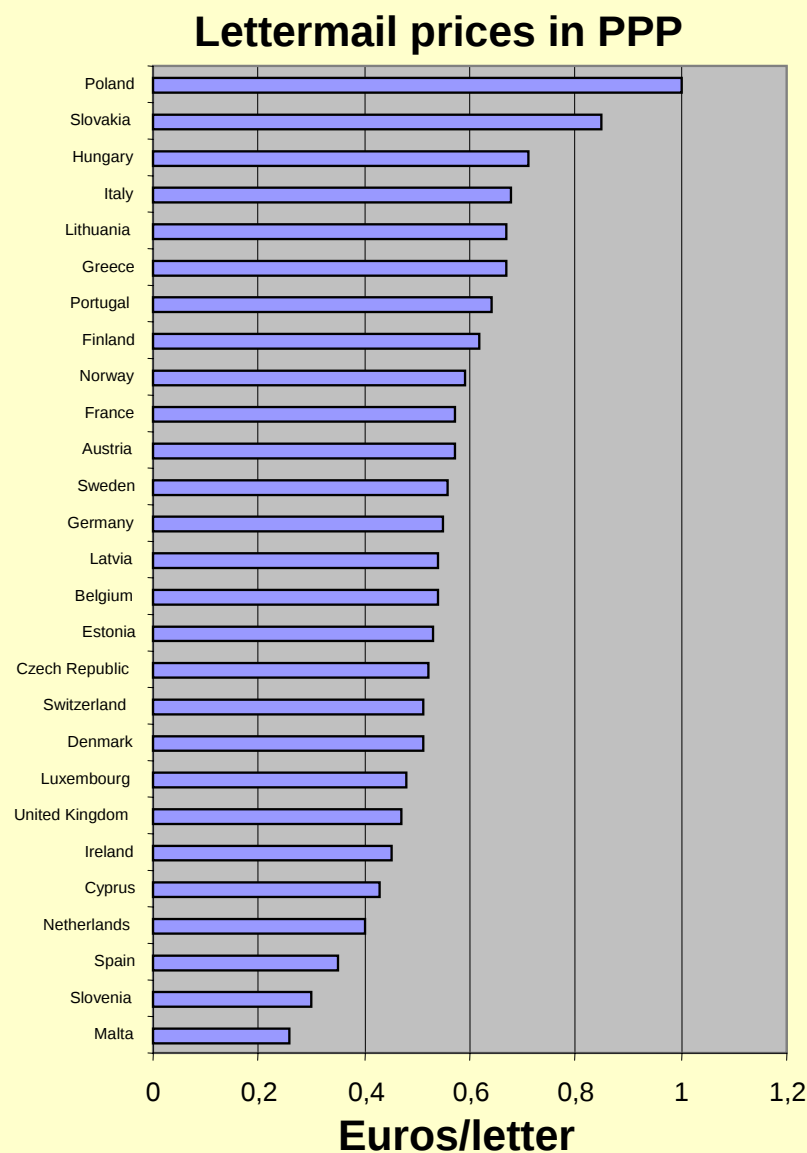
- Several Services of General Interest provide various service levels depending on their localisation. Market forces will undoubtedly tend to push these towards appropriate levels.
- USO service levels could be a problem under multi-national regulation. These pertain to:
 - Counter density and scope of counters
 - Adaptation of the delivery frequency

USO: Affordability in the EU

–Affordability of USO postal services is defined differently depending on the countries and vary from 0,26 to 1,00 (EUR in PPP) for a single 1st class lettermail; historical benchmarks most frequently used to define “affordability”.

–In any case, USO expenditure represents extremely limited portion of the consumers’ basket

–Limited tariff increases could significantly reduce USP financial pressure, especially if access prices are benchmarked against single-piece tariffs.



Source: DPWN

Implications of Model Development

- Generally, “subsidiary dominates” as long as there is a level playing field (VAT exemption a problem here)
 - Country differences can be accounted for
 - However, USO is a flag for many types of ships!!
- Measurement and valuation of USO scope essentially non-existent, so policy makers pretty much in the dark if they want to support USO scope decisions with cost/benefit studies.
- Empirical assessment should precede brave policy pronouncements, not just for reasons of avoiding irreversible damages to the postal infrastructure (Graveyard Spiral), but also with due respect for efficient economic design.