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**The future of the USO –
Economic rationale for universal services and
implications for a future-oriented USO**

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1. Introduction

Universal service obligations (USO) in the postal sector currently enjoy considerable attention among politicians, practitioners and academics. The primary areas of interest have been the viability, costing and funding of the USO in a completely liberalized market. However, the purpose and the scope of the USO itself have so far not been questioned fundamentally. Indeed, the EC commission has left the traditional definition unchanged in its most recent postal directive 2008/6/EC.

Recent declines in overall mail volumes indicate fierce intermodal competition between postal and telecommunications networks (called “E-Substitution” from the postal point of view). In the US, overall mail volumes have declined by almost 17% between 2006 and 2009.¹ Many operators predict volume declines by 30% and more in the years to come. High fixed costs and increasing price elasticities raise the question of how to finance the postal USO in the long-run.

In line with this development, new substitutes might also be a means to replace the traditional postal USO itself. Hence, a crucial long-term question will be whether increasing E-Substitution will inevitably lead to “U-Substitution” where states and governments prefer moving to a new form of USO encompassing the broader communication market, rather than subsidizing the traditional postal USO.

This fundamental question is at the core of our paper: How can the postal USO be adapted to preserve its commercial viability while safeguarding its relevant characteristics for the economy?

After a brief outline of today’s role of postal services in Section 2, we analyze in a first step the possible rationale for USO from an economic point of view. Based on our economic framework as presented in Jaag and Trinkner (2011b), sector-specific deviations from the perfect markets paradigm motivate sector-specific regulations such as the USO. The framework allows us in Section 3 to discuss various USO dimensions in light of potential market imperfections (asymmetric information, transaction costs) and, more importantly, incomplete markets (positive externalities, network effects).

Given the two-sidedness of the postal market, the USO can be analyzed along three basic dimensions, one being the sender, the second the recipient, and the third the connection between the two (the platform). Every dimension has specific key characteristics. Matching these dimensions and characteristics with the relevant deviations from the perfect markets paradigm, we derive the economic aims behind the USO (“rationale for the USO”) in Section 4.

In a second step we analyze in Section 5 the impact of converging postal and telecommunications markets (the convergence expresses itself in new substitutes and e-substitution): Are there alternative means to fulfill the economic rationale behind the USO in a more efficient way? We identify aspects for which electronic and hybrid means are true alternatives. In other words, the new means are not able to fully replace postal services in their role to fulfill the USO. They will rather complement traditional means and thereby allow for targeted adaptations of the USO. Section 5.3 presents then generic principles to guide the design of such adaptations and provides an outline of a future-oriented USO. Section 6 concludes.

¹ USPS and Cahiers de l’ARCEP, Septembre-Octobre 2010, p. 55.

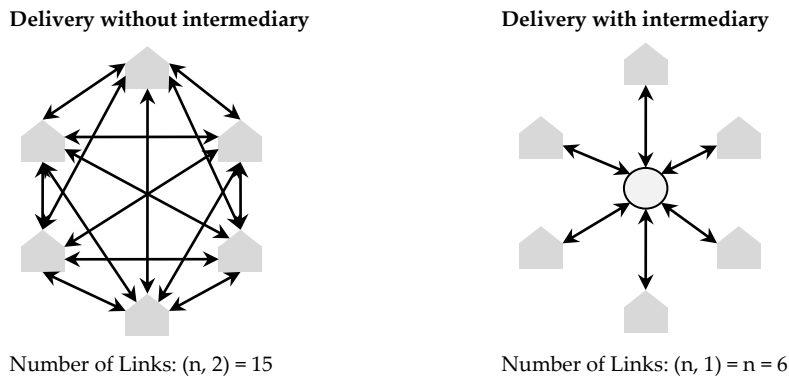
2. Postal services today

Today's role of universal postal services can be understood along the following dimensions. First, universal postal services can be seen as "enablers" to other parts of the economy by linking buyers and sellers. Second, in line with the progress of digital means for written communications and financial transactions, posts can be seen as transformers between the physical and the digital world. Third, politicians often attribute a social role to postal services. Last, universal service obligations and their financing raise competitive issues in fully or partly liberalized markets.

Traditional role: The post as "enabler"

Postal services are a means for senders to overcome distances to recipients. As illustrated in Figure 1, postal services act as intermediaries that consolidate mail of different senders, thereby reducing transaction costs through the exploitation of economies of scale, density, and scope.² As a result, transaction costs for the delivery of letters and parcels are reduced greatly compared to self-delivery by individuals.

Figure 1: Post as intermediaries that minimize transaction cost



In the limit, with a high number of senders and receivers, a postal system has a low number of connections compared to self delivery:

$$\lim_{n \rightarrow \infty} \left(\frac{\binom{n}{1}}{\binom{n}{2}} \right) = \lim_{n \rightarrow \infty} \left(\frac{n}{\frac{n!}{2!(n-2)!}} \right) = \lim_{n \rightarrow \infty} \left(\frac{2}{(n-1)} \right) = 0.$$

As a consequence, postal services are an integral part of the daily commercial activities. Following Dietl and Trinkner (2009), these can be characterized along the following basic processes: (1) making potential customers aware of an offer, (2) agreeing on a bargain, (3) delivering the promised deliverables, (4) billing, and (5) payment by the customer. For standing orders, (6) customers need an enforceable way to quit subscriptions. The sequence of these steps is largely determined by the payment mechanism in place. Historically, universal services have played (and are still playing) a vital role in all six process steps:

(1) Advertising: Letters (direct mail) are an important means to advertise new products in a specified area or for selected customers satisfying certain criteria ("targeting"). In contrast to other media, direct mail remains the only means to physically reach any customer, no matter where the customer may live, its internet usage patterns, or whether a TV is available, switched on at the

² See Farsi et al. (2006) for a definition and computation of economies of scale, density, and scope.

right time on the right channel. In Switzerland, the postal channel historically was very popular for sending product samples, e.g. testers of a new candy.

(2) Closing a deal: An important fraction of (bargain) contracts are signed at home and sent to the contracting party by mail. Whether or not one closes a distance sale depends largely on the availability, reliability, quality and price of postal services (letters, parcels) and their support for the enforceability of a contract. Thereby, the ubiquity of universal services increases the market as businesses can reach a larger number of potential customers.

(3) Delivering: Long distance sales require a convenient, modestly priced and reliable parcels service to deliver the goods to the buyer. Senders must be reasonably sure that the goods have been delivered to the recipient/client.

(4) Billing: For subscriptions, but as well for distance and online selling, a cheap standard mail service will be required to send invoices and dunning letters. For outstanding invoices, additional added value services will be of importance, e.g. registered mail or writs. Thereby, a higher quality of the service will increase the credibility of these means.

(5) Payment: Besides the need for a reliable threat of sellers to enforce outstanding invoices (see 4.), a convenient low-cost payment means should be available. Here, post offices often play an important role: Taking Switzerland as an example, anybody can pay any bill with cash without any surcharge.

(6) Cancellation: To cancel a subscription, the contracting party often requires a notice in writing. Again, letters must be available and accessible.

Table 1: Business processes and corresponding postal products

| Generic Business Process | Role of Postal Services |
|-------------------------------------|---|
| (1) Advertisement | Addressed and unaddressed mail |
| (2) Closing a deal | Letters, registered mail |
| (3) Delivering | Parcels, periodicals & newspapers, letters |
| (4) Billing | Invoices, reminders, registered mail, writs |
| (5) Payment | Checks, postal counters, postal payment systems |
| (6) Cancellation (of subscriptions) | Letters, registered mail |

Source: Dietl and Trinkner (2009)

Table 1 provides a summary of the role of postal services and shows how postal services are an integral part of the daily commercial activities. Thereby, universal postal services reduce transaction costs between buyers and sellers in various aspects. They also play an important role in enforcing contracts and property rights (cf. Section 3 for an economic treatment). For the latter, it is of importance to recognize the role of the postal system as an integrating part of a national legal system to enforce contracts. Without reliable standard mail services (to send invoices, reminders), registered mail and writs (possibility to have a proof of having informed the counter party), and cheap payment means for anybody (including people without a bank account), many trades would not take place.

This interplay between letters, parcels, and financial transactions is reflected in national universal service obligations that often include all three product categories. The importance of this interplay is reflected in a global scale as well: The Universal Postal Union (UPU), established in 1874 as one of the oldest international organizations, aims to ensure interconnection and termination of international letters, parcels, and financial payments.

If postal services enable economic activity, can economic activity be measured by postal volumes? Does economic activity (e.g. taking the GDP as proxy) influence postal volumes or is it the other

way round? If the arguments above hold true, there will be a connection in both ways: Good postal services will foster economic activity, and higher economic activity will result in higher postal volumes. It is not surprising that most empirical studies on this matter have shown a strong, often close to 1:1 relationship between GDP and overall letter volumes. That is, 1% more economic GDP would increase postal volumes by about 1%, *ceteris paribus*. Trinkner and Grossman (2006) show that despite e-substitution, the relationship still holds true in Switzerland.³

More recent role: The post as “transformer of last resort”?

With regards to e-substitution it is crucial whether postal services will keep their (economic) importance in a digital age. There is an extensive literature on e-substitution and the future of mail.⁴ The results indicate clearly that traditional postal services are increasingly substituted. These substitutes are preferred by customers because they offer similar service features. Consequently, postal operators are forced to offer competitive access to their (traditional) channels. Postal operators have three options – and most modern administrations follow the three paths simultaneously.

Firstly, posts use new digital technologies to add value to their traditional products. Examples include track and trace services and intelligent mail. Secondly, posts have introduced electronic substitutes themselves, e.g. electronic registered mail, electronic P.O. boxes, electronic delivery, or e-banking, mobile and EBPP for payment services. Thirdly, posts increasingly act as “transformers” between physical and digital media. Examples include E-commerce, hybrid mail, document services, electronic stamp, response management, mailroom services, scanning, in-payments, out-payments, integrated e-shops including physical delivery and payment, and other. By offering these interfaces, posts implicitly support the digital world by serving as a “transformer of last resort”, similarly as national banks do in their role as “lender of last resort”. Consumers can, if they want, go back into the physical again (Dietl and Trinkner, 2009).

In this light, posts can be seen as a “physical insurance” for digital means by providing a physical backup.

The social role

A third role often raised in political discussions is the impact of universal services to rural regions, labor conditions, social cohesion, and accessibility to citizens for voting and taxing.

The competitive role

A last aspect has emerged in partly or fully liberalized markets. Universal service obligations and their financing have fundamental effects that are important for all operators engaged in the postal market. First, pricing constraints implied by the USO move prices away from the competitive equilibrium which may lead to a deadweight loss (Cremer et al., 2001). Second, it may determine the business model of the largest player in the market and thereby change the market structure (cf. Dietl et al., 2011b and Jaag, 2011). Third, it requires a financing mechanism to compensate for the net cost of the USO, which may lead to over- or under-funding of the Universal Service Provider (USP) and change the profitability of competitors (cf. Jaag and Trinkner, 2011a). Hence, the USO is as much a competitive policy as it is a social policy.

³ Note that the effect of e-substitution overlays other effects such as economic activity. Hence, postal volumes can well differ from GDP or other measures for economic activity. See Trinkner and Grossmann (2006) for an illustration.

⁴ See Nikali (2011) for a recent contribution.

3. Economic foundations of the postal USO

In order to understand the underlying need for universal services and develop recommendations for its adaptation in an electronic age, this section presents an economic foundation to the USO. There are different ways to motivate the postal USO using economic theory.⁵ In this section we apply the economic framework as presented in Trinkner (2009a) and Jaag and Trinkner (2011b) to the postal sector. Thereby, we summarize the main contributions in the field and elaborate on the relevant economic concepts to explain the USO.

3.1 Perfect markets: Redistribution

In perfectly competitive markets, the resulting competitive equilibrium is Pareto optimal (first fundamental theorem of welfare economics). Hence, there is a priori no need for regulating universal services.

The second theorem of welfare economics establishes that by use of appropriate lump sum transfers, one can achieve different Pareto efficient market equilibria with different wealth distributions. This second theorem gives rise to a first fundamental source of market interventions: redistribution. For example, if a society agreed on a social goal like an even income distribution, it could do so by appropriately defining lump sum transfers. Lump sum transfers are hard to establish in practice due to asymmetric information and transaction costs. Following Cremer et al. (2001, 2008) uniform pricing obligations can be seen as a 2nd best redistributive pricing policy to contribute to the targeted wealth distribution. Uniform pricing has at least two redistributive effects, from business customers (low cost, high bargaining power) to private customers (high cost, low bargaining power) and from densely populated regions to remote regions with high-cost delivery. Crew and Kleindorfer (2002, p. 12) argue that the deregulation's likely primary driver is based on such redistribution grounds.

3.2 Market imperfections

Sector-specific deviations from the perfect market paradigm are a second source to explain the postal USO. Recall that the perfect market assumption lies at the basis of the two welfare theorems. Important assumptions are:

Assumption 1: Any company or consumer in the economy acts as price taker, i.e. there is no bargaining or market power;

Assumption 2: Markets are complete, i.e. there exists a price for every good – there are no externalities (or they are readily traded and thus internalized correctly);⁶

Assumption 3: Information is symmetrically distributed (no asymmetric information) and there are no transaction costs.

These assumptions are very rigid and they are hardly ever met in practice. This gives room for market failures. Market failures are “situations in which some of the assumptions of the welfare theorems do not hold and in which, as a consequence, market equilibria cannot be relied on to yield Pareto optimal outcomes” (Mas-Colell et al., 1995, p. 350). As a consequence, general and sector-specific regulation tackling the relevant market imperfections can potentially result in efficiency gains.

⁵ An overview over normative and positive concepts is provided in Cremer et al. (2001).

⁶ For the link between incomplete markets and externalities see Arrow (1969).

3.2.1 General market imperfections across sectors

Many deviations from perfect markets can be observed in most if not all markets. Generally, it makes sense to tackle them uniformly and equally among all sectors of an economy. First of all, and in light of important information asymmetries, any society must find ways to allocate and enforce property rights, and to secure commercial freedom and free adjustment of prices. Consequently, an important share of civil and commercial law deals with securing property rights and making contracts better enforceable in a world of incomplete contracts and asymmetric information. Further important sources of general regulations are competition or antitrust laws aiming to limit harmful abuse of market power.

With respect to postal services, relevant general law includes the legal status and means of written (handwritten and electronic) signatures to enforce property rights. Historically, handwritten signatures have been complemented with registered mail services which are often part of the legal framework.⁷ In that they become official means to enforce contracts, thereby improving market efficiency. Following the idea of Dietl and Trinkner (2009), this role requires the combination of two features being offered in the market place: (1) legally binding proof of receipt for written correspondence, e.g. registered mail services, and (2) a network that can reach everybody based on her name (and physical and/or electronic address). Where the market does not provide such services, corresponding sector-specific USO regulations in postal and/or telecommunications acts might be appropriate to improve overall market efficiency.

3.2.2 Sector-specific market imperfections

Sector-specific deviations from the perfect markets assumptions 2 and 3 provide important motivations for the postal USO.

3.2.2.1 Externalities

External effects are present when one economic agent's action affects the actions of other agents in the economy. External effects can be positive or negative and are closely linked to incomplete markets; when an economic agent's own action has a positive effect on others but is not rewarded in return, there exists no market for this external effect. In general, when external effects are present, market equilibria are not efficient, as these effects are not taken into account in individual decisions and induce an "externality" (positive or negative). However, potentially, they can be "internalized", e.g. by public obligations, taxes, quotas or the allocation of property rights (where these are in fact enforceable without causing excessive transaction costs, see Coase, 1960, Mas-Colell, 1995).

There are three approaches to motivate the postal USO based on externalities; each of these is described in detail below.

Classical view

The utility of a user increases with the number of users connected to the network. For example, a phone subscription is much more valuable if others are connected to the network too (among others, cf. Willig (1979)). Hence, one agent's decision to subscribe or not affects the utility of others.

In this view, a USO can be seen as a policy to correct market inefficiencies caused by (network) externalities. Similarly, letters as a media might be much more attractive if everyone can reach

⁷ Code of obligations, tenancy laws and many other acts often include registered mail services. Thereby, it is assumed that such services are available (or regulated elsewhere in detail).

anyone. While the argument is not contested in telecommunications where recipients must pay a price to be connected to the telecommunications network (see e.g. Riordan, 2001), the situation is different in the postal markets. Cremer et al. (2008) claim that this view is “probably of limited relevance for the postal sector”, as it relies “on a symmetric view of externalities where all subscribers are potential callers and receivers” (p. 27).⁸ The crucial question in the classical view is whether postal operators are able to internalize network externalities through differentiated pricing in a completely deregulated market. Independently of the symmetry-argument by Cremer et al. (2008), one can argue that there are network externalities that cannot be internalized by price differentiation of postal operators in a completely deregulated market if there are (1) capacity costs or fixed costs that require two-part tariffs for first-best pricing combined with (2) non-excludability of consumption with regards to the fixed part of the two-part tariff. Because of potential free riding, this is indeed the case in the postal market: For a sender it will not be optimal to pay the postal service the fixed fee. Instead, it will be optimal to share the fee with a neighbor or use consolidators. Operators may react by suboptimal coverage (too low) and/or suboptimal pricing (too high), leading to a failure to internalize the network externalities optimally. This would raise the need for a nationwide USO in coverage and affordability.

Two-sided market view

Closely linked to (or a more modern view of) network externalities are externalities between different market sides of a platform. Where lump sum price redistributions between market sides affect overall demand, markets are said to be two- or multi-sided (Rochet and Tirole, 2006). These pricing implications are crucial, and often one market side remains heavily subsidized. Many network industries, such as telecommunications, cable networks and postal markets can be understood as being such platforms. The larger the one side of the platform, the greater the utility on the other side of the platform. Such cross-side effects inhibit externalities that might call for USO regulations.

There is no doubt that postal markets are two-sided (e.g. Panzar, 2006, Cremer et al., 2008, Jaag and Trinkner, 2008). Postal operators are platforms (intermediaries) that link senders and recipients, as well as sellers/businesses and buyers/clients. The larger the recipient base, the greater are the business opportunities on the sender side and the more attractive are letters as a medium/platform. Conversely, recipients may be more likely to empty their mailbox if they can expect many letters from a large sender base.

Jaag and Trinkner (2008) discuss the implication of the two-sidedness of the postal market on pricing and show the importance to subsidize the recipient side of the market. Their results support the “sender pays principle” of today’s postal markets including free home delivery as ensured by today’s USO.

Cremer et al. (2008) show in their two-sided market model that a profit maximizing postal operator will chose a suboptimal low quality in delivery (coverage or reduced frequency of service) leading to a decrease in demand.⁹ The authors conclude that “this problem might be solved, or at least mitigated, through a USO” (p. 28) and thereby provide a basis for quality and coverage constraints.

⁸ In the telecommunications market, a large part of the consumers sends (calls) about as much as it receives whereas in the postal market, net flows are strongly imbalanced. A small group of large mailers accounts for a large part of the items sent. Correspondingly, a high fraction of recipients receives much more postal items than it sends.

⁹ The model assumes that senders’ surplus depends on the number of households that can be reached at a certain level of service. When a call externality is introduced into the model (increasing utility of addressee in number of mail items received), the results are reinforced.

The definition of two-sided markets may also provide support for uniform pricing, as illustrated by the following example. Postage is usually charged to the senders. However, the charges are often passed on to the recipients, e.g. by banks or distance mail order companies. If these pass on single piece prices instead of wholesale prices collected by the postal operators (which is very often the case), the price signals in the market (single-piece price) are higher than the effective (wholesale) prices charged by the platform. Under uniform pricing, there is no difference and hence overall demand will be higher.

Public/merit good

A third view introduced by Gori et al. (2002) is that the postal network can be characterized as public good, independently of the services offered to the consumers (e.g. social cohesion, functioning of democracy, ethical issues). Cremer et al. (2001, 2008) argue that such a network can be understood as producing “externalities that are non-trivial in nature”. Hence the USO (especially accessibility requirements for traditional post offices) would be a mechanism for the provision of the public good (even if the mere postal services were private goods). Hence, public goods might offer a second line of argumentation to justify social issues, or alternatively, be used to support redistributive pricing policies (cf. Section 3.1).

3.2.2.2 Information asymmetries

An important issue related to asymmetric information is the hidden characteristics of postal services. Traditionally, quality of service has been hidden information (the sender cannot observe the quality of service as the service is fulfilled on the recipient side). In turn, adverse selection cannot be excluded which may lead to suboptimal quality in the market. In this light, the USO with corresponding regulatory authorities might be seen as a measure to ensure a standard quality in the market with the least cost of monitoring.¹⁰ Note however that in some market segments, track and trace solutions are becoming the standard means for delivery, allowing senders to observe the delivery status of their items. This resolves the issue of asymmetric information.

3.2.2.3 Transaction costs

The transaction cost argument as presented in Section 2 is likely to be resolved by the market (by postal operators) wherever the consumers’ reductions in transaction cost exceed the cost of service provision. Crew and Kleindorfer (1998) argue that uniform pricing regulations might yield reductions in transaction costs that are otherwise not achieved by the market. Uniform prices can reduce uncertainty for senders and allow higher efficiency in mail collection and processing. If the reduction in transaction costs is higher than the welfare losses eventually caused by uniform pricing,¹¹ uniform pricing is optimal and should be included in the USO for those market segments where a deregulated market is expected to lead to (or enforce) price differentiation (e.g. because of entry in low-cost delivery areas).

4. Economic rationale of the postal USO

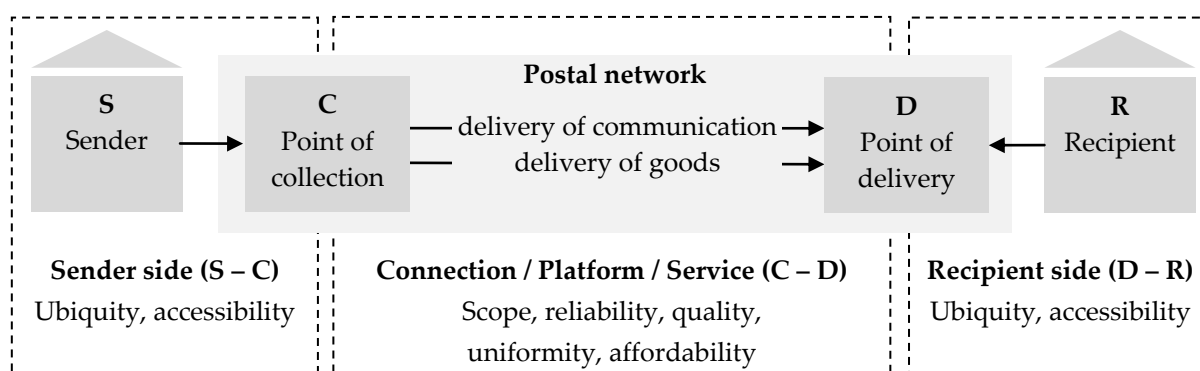
As a consequence of the two-sidedness of the postal market, the USO can be analyzed along the three dimensions that are illustrated in Figure 2.

¹⁰ Asymmetric information is present in many industries. Regulation is required where the industry fails to develop credible solutions (e.g. quality certificates).

¹¹ In perfectly competitive markets, uniform pricing constraints always decrease welfare. However, as we have seen above, this is not necessarily the case in the postal market as there are important deviations from perfect markets, e.g. externalities.

Relevant *sender-specific features* include the opportunity cost for sender *S* to reach postal services at the point of collection *C* (e.g. post office, agency, online), the availability of services and opening hours in *C*, and availability of online solutions and ability of *S* to use them. In analogy, the *recipient-specific features* are the opportunity cost of recipient *R* to reach postal services at the point of delivery *D* (e.g. mail box, post office, P.O. box, electronic inbox), the availability of services and time of delivery at *D*, and the availability of online solutions and ability of *R* to use them. The third dimension is characterized by the *services* provided by the platform to link the sender and recipient sides (*C – D*). Of relevance are the basic products offered (e.g. letters, parcels) including their specific features (e.g. end-to-end speed, reliability, price, value added services).

Figure 2: USO elements in the two-sided market approach



The USO candidates as developed in Section 3 can be assigned to these three dimensions as illustrated in Figure 2. Ubiquity and accessibility are of concern for the sender and recipient side. Important characteristics of the platform (the service between the sides) include the scope of services (e.g. letters, parcels, registered items), reliability, quality, uniformity, and affordability.

In this context, an “economic rationale of the USO” that precludes any potential market failure as discussed in Section 3 would read as follows:

“Ensuring standard services (“uniform”) for the delivery of written communication and goods (“scope”) that enable everybody in the economy to reach everybody else (anybody connected as sender and recipient, “ubiquity”) under reasonable accessibility (no large effort to use the service as sender or recipient, “accessibility”) within a reasonable timeframe (for example next day, “quality”) on a reliable basis (one must know that the recipient indeed receives the items sent, “reliability”) at affordable rates (the cost should not exclude from consumption, “affordability”).”

This rationale is a priori not far away from legit

A crucial question is whether the potential market failures discussed above are likely to be present in the postal sector in the future. In particular, some of the economic needs might already be fulfilled sufficiently by electronic alternatives. Wherever the market is likely to satisfy the needs satisfied by the USO, sector-specific regulation should fade out or turn inoperative. Given the “digital revolution”, changes of the need to regulate postal universal services are likely. In the remainder, we investigate the impact of electronic alternatives and derive an outline of a future-oriented USO.¹²

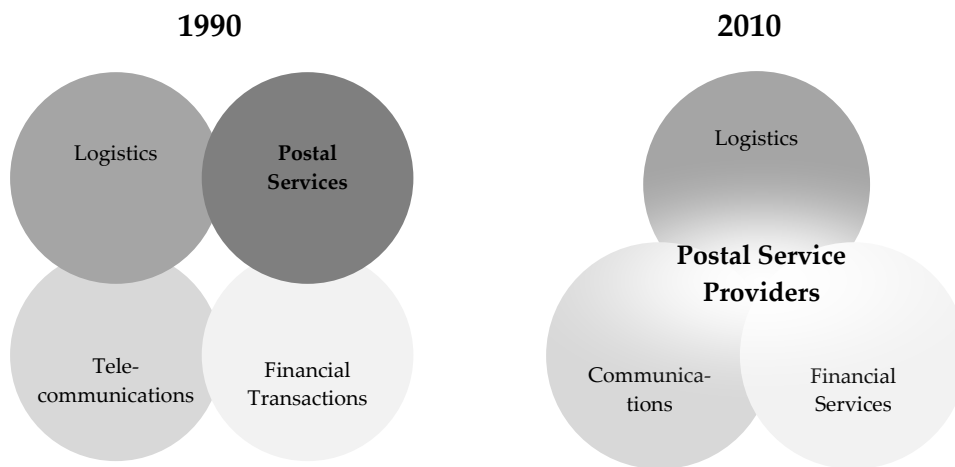
¹² To derive the actual needs of the customers, a comprehensive market survey would be necessary. Currently, the EC has commissioned a study Rand Europe, Accent and Swiss Economics to better measure consumer preferences in the postal market. The study will be published by the end of the year.

5. Defining the USO in an electronic age

5.1 Convergence of postal and telecommunications markets

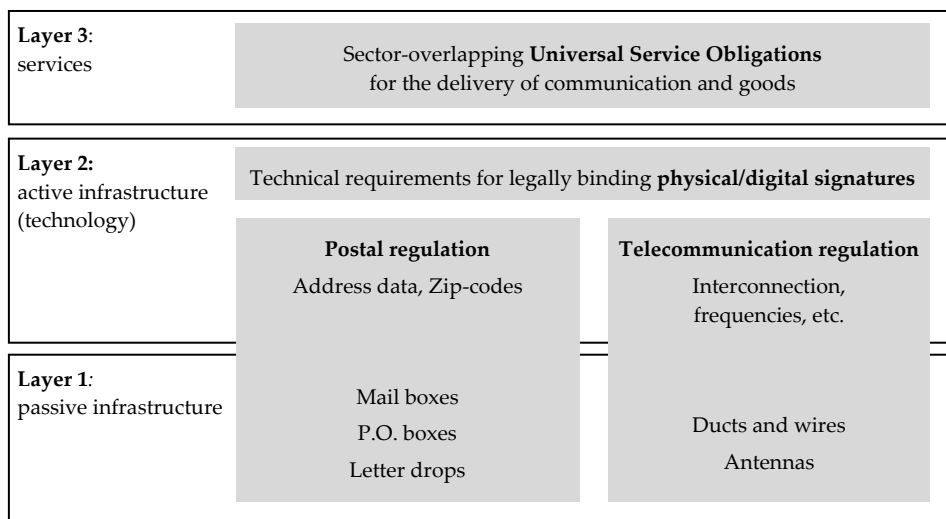
The digitalization trend of the past decades has resulted in a number of new technologies allowing letters to be increasingly replaced and substituted. Written communication takes place in digital media while letters have seen their peak in most industrialized countries.¹³ Indeed, one can argue that the postal market and the telecommunications market are converging and that e-substitution is a reflection of letter mail's loss in market share in the communications market. Figure 3 illustrates the structural change of the postal industry due to the convergence of transaction-based markets.

Figure 3: Evolution and convergence of (transaction) markets



Source: Dietl et al. (2011a)

Figure 4: Sector-specific Regulation in Converging Markets



Source: Based on Maegli et al. (2010)

¹³ See Trinkner (2009) for the historic development of mail volumes in Switzerland since 1900.

Maegli et al. (2010) propose a “unified approach” to regulate universal services in posts and telecommunications. Such an approach would consist of a jointly defined universal service obligation and corresponding regulation, together with a separated, sector-specific regulatory regime for monopolistic bottleneck resources and interconnection issues. This framework would be consistent with the layer-oriented framework often applied in the telecommunications market (“disaggregate approach”, see Knieps, 2002). Figure 4 is inspired by these approaches.

5.2 New means communications: Substitutes and complements

In such a “layers-oriented unified approach” – and in line with the economic “rationale of the USO” as developed in Section 4 – the combined postal and telecommunications USO would be defined in a rather generic and flexible way. Thereby, changing market conditions and the impact of new substitutes are implicitly accounted for.

Recalling the analysis of externalities in Section 3.2.2, new digital means resulting in platform competition between physical and digital means are likely to change the economic need for internalizing externalities by USO policies. For example, registered mail might diminish in value to the society when digital alternatives like digital signatures (a) have been implemented in the legal framework and (b) have succeeded in the market. While some USO elements may be of decreasing value, others may become more valuable to society. Examples are the delivery of parcels because of online shopping or the role of postal services as “transformers of last resort” (cf. Section 2.2). Similarly, new combinations of physical postal services with new digital means will allow for selected adjustments of the postal USO. Potential candidates are, among others, electronic collection of letters (that are later printed out and delivered physically) or electronic/hybrid delivery of letters (scanning, instantaneous electronic delivery, weekly physical delivery of scanned mail).

Figure 5 illustrates the platform competition in the delivery of communications (substitutes) as well as new digital means that can improve traditional postal services (complements, dotted arrows).

Figure 5: Substitutes and complements in the delivery of communication and goods

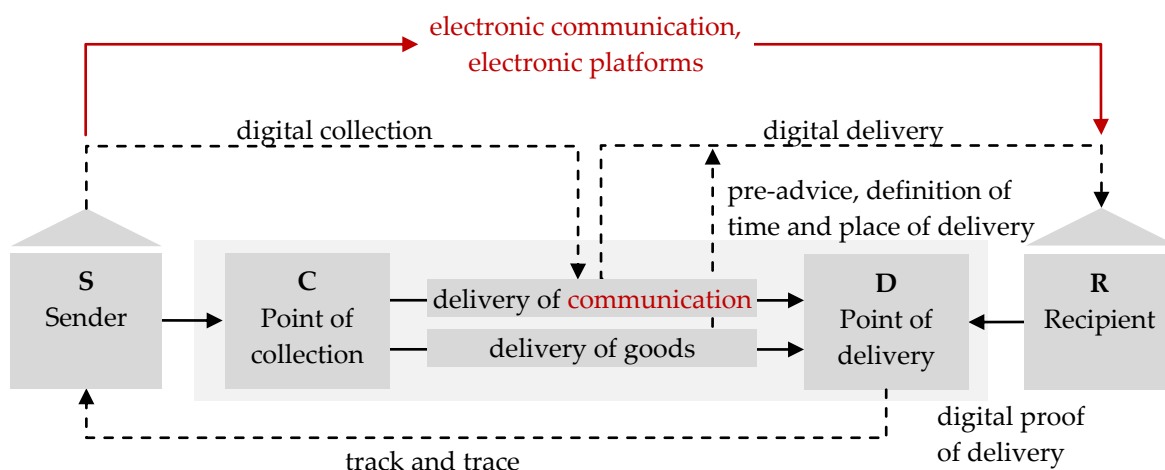


Table 2 presents an indicative, non-exhaustive list of the new digital means (column 4) and complements (column 3) against potential evolutions of physical means (column 2).

Table 2: New means to provide universal services

| Economic Rationale | New physical means | New digital complements | New digital substitutes |
|--------------------|--|--|---|
| Sender | | | |
| Ubiquity | – | “Territorial neutrality” | “Territorial neutrality” |
| Accessibility | Modern customized collection points, 3 rd party collection, pick-up | Online solutions, mobile solutions | Online solutions, mobile solutions |
| Recipient | | | |
| Ubiquity | – | Recipients without physical address, virtual recipients | Recipients independent of physical address, virtual recipients, multiple addresses |
| Accessibility | Centralized mail boxes, customized and variable delivery locations ¹⁴ | Digital inboxes ¹⁵ , tracking services | Online solutions, mobile solutions |
| Connection | | | |
| Scope | – | Added value services, electronic services | Limited to communication in general |
| Quality | Improvement in Quality of Service | Electronic pre-delivery ¹⁶ | Instantaneous delivery |
| Reliability | Guaranteed delivery | Tracking services for letters ¹⁷ , digital signatures from recipients, personal permanent address ¹⁸ | Digital identities, digital signatures, fully encrypted communication, 100% reliability |
| Affordability | Competitors | Depending on avoided cost in physical delivery | Low to zero cost |

The 3rd column of Table 2 indicates that digital substitutes for postal services are limited to communication. Regardless of the digital revolution, delivery of physical goods will remain important. The second column shows that there are important digital complements to traditional postal services that can be used to fulfill the economic rationale of the USO. As a consequence, it is likely that the current definition of the USO will have to face a change in the near future.

5.3 Adapting the postal USO to an electronic age

5.3.1 Generic principles to amendments of the USO

Given our economic foundation of the postal USO, any realignment of the USO should be based on the following five principles:

- *Output-orientation*: Viewing postal operators as companies transforming inputs (labor, capital/infrastructures, energy) into outputs (mail items collected and delivered), obligations should tie to outputs rather than inputs. An example of an input-regulation would be a minimum number of traditional post offices or frequency of delivery. Instead, regulations should be output-oriented and describe accessibility of services or speed of service (e.g. next day excluding Sunday).

¹⁴ E.g. Pick-Post, a means by Swiss Post where recipients can flexibly chose their delivery location.

¹⁵ E.g. eBoks, NetPosti.

¹⁶ E.g. Swiss Post Box.

¹⁷ E.g. „A-Post Plus“ from Swiss Post.

¹⁸ Generic, unique address that follows recipient worldwide and throughout its life.

- *Technological neutrality*: Output-regulations should be defined independently of the technology applied. Regulations should not be linked to a particular technology. Rather, output-regulations should be aligned to the consumers’ needs.
- *Product neutrality*: The output-regulations should be formulated in a rather generic way in order to allow the universal service provider to amend its product portfolio over time. Hence, product-specific obligations (e.g. “first class mail”) should be avoided.
- *Necessity*: Universal services are to be defined as a basic service addressing the most basic needs of the consumers. On top of these basic services, universal service providers (or their competitors) will be able to provide value added services on a purely commercial basis.
- *Viability*: The obligations should be defined in a viable way in order to avoid an excessive external financial need to compensate for the cost of the USO.

For illustrative purposes, we outline a technology-neutral USO in delivery in the following section.

5.3.2 Example: Delivery

Traditional USO in the postal sector often include an obligation to deliver countrywide on at least five days per week.¹⁹ There have been various attempts at reducing the cost associated with this obligation. Examples include delivery to centralized Post Office boxes in remote regions instead of doorstep delivery, reduced delivery frequency in remote areas, outsourcing of rural deliveries to partner firms with more flexible labor cost, or differentiated pricing (zonal pricing) to reflect differences in delivery cost across regions.

The most important hindrance for the introduction of such relaxations to the USO is lacking consumer consent. However, from a technology point of view, in many places, giving away free e-readers such as Kindle or iPad would cost considerably less than printing and delivering postal items. Hence, the USO could be adjusted such that convenient alternative forms of delivery means may be chosen as alternatives to physical delivery. A recipient might not insist on a daily physical delivery if in turn it gets an e-reader and guaranteed electronic delivery of all letter mail items while still being guaranteed that all requested items are delivered physically some time (e.g. every other day, once a week).

An example for such an electronic delivery service complementing and potentially substituting physical delivery is the “Swiss Post Box” service. Whenever Swiss Post collects and sorts a letter addressed to the receiving customer, the envelope is scanned and emailed to the customer’s cell phone. The customer then has the options to have the letter opened and scanned, recycled, archived or delivered to the physical address. Hence, not all letter mail needs to be delivered physically and daily.

The commercial viability of such a service depends on a technologically neutral formulation of the USO.²⁰ This means that the focus is on the satisfaction of consumer needs, not on the technology used to achieve it. For example, if the main needs of recipients concerning postal services are physical and timely delivery, the technology used by the operator is of little interest. Being a secure electronic complement to the physical mailbox, “reverse hybrid mail services” such as Swiss Post Box improve physical delivery and save postal operators’ costs at the same time.

¹⁹ See EC Postal Directive 2008/6/EC.

²⁰ See Dietl et al. (2010).

5.3.3 Outline of a future-oriented postal USO

In light of the above considerations, a future-oriented USO can be outlined as follows. It is summarized in Table 3.

The universal service provider (the platform) is required to offer at least one letter and parcel service (“basic services”) that ensures compliance with a set of obligations that are related to speed, reliability, affordability and uniformity (“basic requirements”). Those products that are necessary to achieve compliance with the USO requirements are then implicitly the regulated ones. Products that differ in at least one dimension are not regulated. For example, a product with non-uniform pricing or very slow delivery time would not be regulated.

On the sender side, the regulation of collection is limited to the nationwide availability (ubiquity) and accessibility of the basic services. Thereby, no particular form of collection is presumed (e.g. post offices) to enable customer-friendly adaptations of the postal network over time including online solutions where this is feasible.

On the recipient side, the standard mode of delivery remains home delivery for all letters and parcels (i.e. it is not limited to basic services as opposed to the sender side). Whether the associated cost for the USP is appropriate and deviations from home delivery are allowed depends on the electronic alternatives provided. Daily delivery is not required explicitly. It may be required implicitly however where it is necessary or optimal to meet the requirements that the postal platform must satisfy for the “basic services”. For example, daily delivery would be necessary where these requirements include demanding speed requirements such as J+1, while J+3 may make it optimal to deliver every second or third day only.

Table 3: Outline of a future-oriented postal USO

| Economic Rationale | Traditional postal USO (EC stylized) | Outline of a future-oriented postal USO |
|--------------------|---|---|
| Sender | | |
| Ubiquity | Every citizen | Every citizen |
| Accessibility | Letter drop and post office nearby, collection at least 5 days per week | Customer-oriented collection facilities, accessible at least every working day |
| Recipient | | |
| Ubiquity | Delivery to almost every citizen. Delivery at least days per week. | Delivery of basic services to almost every citizen. |
| Accessibility | Mail box or P.O. box for x% of population | Physical and/or electronic mail box. Physical mode to home premises as standard mode, but with increased flexibility if electronic alternatives are available. |
| Connection | | |
| Scope | Letters, parcels, registered mail | Basic service for letters and parcels, option for proof of reception. |
| Quality | Speed: E+1 to E+3 Fulfillment: X% of items. | Standard speed requirement (E+x) for basic services where Sundays and/or Saturdays are not counted in the measurement, less demanding speed requirement where combined with instantaneous electronic delivery |
| Reliability | Postal secrecy | Postal secrecy, integrity requirements for electronic services |
| Affordability | Prices must be affordable | Limited to basic services |
| Uniformity | Prices might be uniform for single peace items | Limited to basic services |

In such a framework, the first role of regulators will be to approve changes in the accessibility of collection and delivery subject to a set of clearly defined criteria. The second role will be to control whether there are products offered by the incumbent that lead to compliance with the rather generic basic requirements as described above. Correspondingly, postal service providers will be flexible enough to adapt their product range over time to the changing needs of consumers as long as the basic requirements are still met.

6. Concluding remarks

In this paper we have discussed how the postal USO can be adapted to preserve its commercial viability while safeguarding its relevant characteristics for the economy.

The primary role of postal services in the economy is the reduction of transaction costs while supporting the enforcement of property rights. The regulation of universal postal services can be motivated by redistributive aims or, alternatively, as a policy to mitigate market failures, notably in the context of network externalities in the two-sided postal market. Based on these potential market failures we have derived an economic rationale of the USO that can be summarized as ensuring ubiquity and accessibility for senders and recipients for a postal platform that provides a set of basic services which are of quality, reliable, affordable and uniform.

We have left opened the question whether USO regulations are (still) necessary from an economic perspective unanswered. Instead we have asked whether the postal USO can be adapted to strengthen its commercial viability in an electronic age while safeguarding the relevant characteristics of postal services for the economy. Doing so, we have summarized electronic complements and substitutes to traditional postal services and have indicated how old and new means can be combined to better provide their economic rationale in the market place.

Based on this analysis we have outlined a future-oriented definition of the USO that follows five generic principles: output-orientation, technological neutrality, product neutrality, necessity, and viability. Following these principles, there will be a need to adapt the USO in most countries. To this end, a crucial source of information will be country-specific, accurate data on customers' preferences for the delivery of goods and communications. Ultimately, the generic principles may end in a "unified approach" where universal services are defined jointly for the postal and the telecommunications sector.

7. References

- Arrow, K. "The organization of economic activity: Issues pertinent to market versus non-market allocation," The Analysis and the Evaluation of Public Expenditure: The PPBS System, Congress Joint Economic Committee, Washington D.C., 47-64, 1969.
- Coase, R.H. (1960). "The Problem of Social Cost". In: *Journal of Law and Economics*. Vol. 3 (1960), S. 1–44.
- Cremer, H.; De Donder P.; Boldron F.; Joram D.; Roy B. (2008). Social costs and benefits of the universal service obligation in the postal market. In: M. A. Crew and P. R. Kleindorfer (eds.), *Competition and Regulation in the Postal and Delivery Sector*. Cheltenham, UK; Northampton, MA, USA, 23-35.
- Cremer, H.; Gasmi, F.; Grimaud, A.; Laffont, J.J. (2001) "Universal Service: An economic perspective", *Annals of Public and Cooperative Economics* Volume (1), 5–43.
- Crew, M.A.; Kleindorfer P.R. (1998). "Efficient entry, monopoly and the universal service obligation in Postal Service," *Journal of Regulatory Economics*, 15, 103-125
- Crew, M.A.; Kleindorfer P.R. (2002). "Regulatory Economics: Twenty Years of Progress", *Journal of Regulatory Economics* 21(1): 5-22.
- Dietl, H.; Fürst, O.; Jaag, C.; Trinkner, U. (2011b). *Defending Mail Markets against New Entrants An Application of the Defender Model to Postal Markets*. Swiss Economics Working Paper 0027.
- Dietl, H.; Jaag, C.; Trinkner, U. (2010). *Postal Regulation and Business Model Transformation*, presentation given at the TIP Conference 2010, Lausanne.
- Dietl, H.; Jaag, C.; Trinkner, U. (2011a). *Reform des Postsektors in der Schweiz: Eine Standortbestimmung / La réforme du secteur postal en Suisse: état des lieux*, *Die Volkswirtschaft* 04-2011, 43-46
- Dietl, H.; Trinkner, U. (2009). El desarrollo de servicios postales universales en América Latina: una perspectiva económica. In: Calzada, J; Costas, A; Jordana, J. *Más allá del mercado. Las políticas de servicio universal en América Latina*. Barcelona, 377-406.
- Gori S. ; Lettieri C. ; Marè M.; Visco Comandini V. (2002). *The myth of the uniform price*. Paper presented to the International Conference on Public Finance, Helsinki, August 29-31.
- Jaag, C. (2011). Entry Deterrence and the Calculation of the Net Cost of Universal Service Obligations, *Review of Network Economics* 10(1), Article 4.
- Jaag, C.; Trinkner, U. (2008). Pricing in competitive two-sided mail markets. In: in M. A. Crew and P. R. Kleindorfer (eds.), *Competition and Regulation in the Postal and Delivery Sector*. Cheltenham, UK; Northampton, MA, USA, 136-149.
- Jaag, C.; Trinkner, U. (2011a). The interaction between universal service costing and financing in the postal sector: a calibrated approach. *Journal of Regulatory Economics*, 39(1):89-110.
- Jaag, C.; Trinkner, U. (2011b). "A General Framework for Regulation and Liberalization in Network Industries", forthcoming in M. Finger and R. Künneke (eds.), *International Handbook of Network Industries – The Liberalisation of Infrastructure*, Cheltenham. Edward Elgar.
- Knieps, G. (2002). "Does the System of Letter Conveyance Constitute a Bottleneck Resource?" In G. Kuhlenkamp and A. Niederprüm (eds.), *Contestability and Barriers to Entry in Postal Markets*. Rheinbreitback: WIK, pp. 9-22.
- Maegli, M.; Jaag, C.; Koller, M.; Trinkner, U. (2010). Postal Markets and Electronic Substitution: What is the Impact of Intermodal Competition on Regulatory Practices and Institutions? *Competition and Regulation in Network Industries*, 11(4):382-397.
- Mas-Colell, A.; Whinston, M.; Green J. (1995). *Microeconomic Theory*, Oxford University Press.

- Nikali, H. (2011). Does the level of price elasticity change with the progression of substitution? In: *Reinventing the Postal Sector in an Electronic Age*. Edited by M. Crew and P.R. Kleindorfer, Edward Elgar, 36-46.
- Panzar, John C. (2006). *PO box access: competition issues in a two-sided postal market*, Presented in Toulouse at the 4th IDEI/La Poste Conference on Regulation, Competition and Universal Service in the Postal Sector.
- Riordan, M. (2001). "Universal residential telephone service". In: M. Cave, S. Majumdar and I. Vogelsang (eds), *Handbook of Telecommunications Economics*, Amsterdam: Elsevier Science.
- Rochet, J.-C.; Tirole, J. (2006). "Two-sided markets: A progress Report", *The RAND Journal of Economics*, 35(3): 645-667.
- Trinkner, U. (2009a). *Regulating the Mail Market: Main Regulatory Challenges in light of Universal Service Provision, Competition, and E-Substitution*. Saarbrücken. ISBN 978-3-8381-0788-2.
- Trinkner, U. (2009b). "*Shaping the USO? An Outline of Thought from an Economic Perspective*", presentation held at the IPC Senior Executive Forum on Regulation, October 2009.
- Willig, R.D. (1979). "The theory of network access pricing". In: H.M. Trebing, ed., *Issues in public utility regulation*, Michigan State University Public Utilities Papers.