Postal Markets and Electronic Substitution: What is the Impact of Convergence on Regulatory Practices and Institutions?

1. Introduction

The European postal markets are undergoing a reform which aims at promoting competition on the one hand and protecting the benefits of public services on the other. The important topics concerning postal regulation and the development of markets are (1) the market regime, (2) the definition and financing of universal services, (3) market power control, and (4) emerging electronic substitution of postal services. Even though the decrease in mail volumes due to electronic substitution is discussed in the literature and experts agree that it will predominantly impact the development of postal markets in the future, there is hardly any discussion about the consequences for regulatory regimes and their evolution. Finding an appropriate co-evolution of regulation and market development is one of the primary challenges of postal reform. The crucial question therefore is how the increasing convergence of postal and telecommunications markets can be mirrored by appropriate regulation.

The postal sector is not entirely different from other network industries, except for the lack of a physically installed infrastructure: Postal networks are rather a combination of physical efforts. The postal network is very labour intensive and not subject to high investments or sunk costs. In a disaggregated approach to network regulation, postal markets are often analyzed along the value chain (including clearance, transportation, sorting and delivery of items). Telecommunications markets are usually described based on their various network layers. Following the “network layers approach”, the telecommunication network can be analyzed as consisting of a passive network layer including infrastructure (e.g. cables in the underground), an active network layer which sends and receives signals and a third layer which represents the services and applications provided on this infrastructure (see figure 1 below). Traditionally, postal regulation focuses on process steps and quality whereas regulation in telecommunications focuses on those infrastructure layers which constitute monopolistic bottlenecks (mainly the local loop).

The postal universal services definition includes a minimum range of products and services including the accessibility of the postal infrastructure as well as quality and frequency requirements. Postal operators more and more invest in digital products and combine them with traditional physical postal services (e.g., electronic PO Boxes and hybrid post solutions). Furthermore, they increasingly aim at installing secure digital identities for their customers to provide safe electronic communication. They therefore provide complementary products and applications based on the network operated by telecommunication providers. In most of the European countries, the Universal Service definition of telecommunication does not include those services and applications but requires the physical interconnection between households at affordable prices. Nevertheless, the possibility of postal

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1 Corresponding author: martin.maegli@post.ch.
2 See e.g. Nikali (2008).
3 See CIFS (2009).
4 See Crew et al. (2008).
6 See Heitzler (2009) for a value chain approach for telecommunications.
7 See Knieps and Zenhäusern (2009).
8 Letters up to 2 kilograms, parcels up to 10 kilograms as well as registered and insured items.
operators to develop applications in a digital environment also allows for creating hybrid solutions in combination with products of the postal universal service.

This increasing convergence between postal products and telecom applications is a new phenomenon which needs an according co-evolution of regulation. Which parts of current regulation will become redundant? Is there additional regulation needed due to new bottlenecks or changes in consumer behavior? In our qualitative analysis, we investigate the impact of intermodal competition and growing convergence between postal and telecommunications services on regulatory institutions and regulatory governance costs. We set up a comparison between the networks and compare the scope of universal services and issues concerning market power regulation in the two different industries. Finally, we derive several regulatory policy implications for postal services based on or combined with electronic solutions and how regulation could deal with this convergence.

2. Economic Foundations for Regulation in Network Industries

Based on different sources of market failures, there are the following main rationales and dimensions of regulation in network industries:

- **Bottleneck regulation** is necessary if there is persistent market power due to economies of scale, scope or density in combination with sunk costs. This allows an operator to ask prices above their efficient level and therefore results in an inefficient allocation. Regulation therefore applies to access regulation to those bottlenecks that are persistent (durable over time).

- **Universal service and default service regulation** assures the ubiquitous availability of good quality services at affordable prices. Among other things, it defines such obligations on one or several operators and their financing. It also designates these operators. From an economic point of view, universal service regulation can be explained by externalities. Similarly, **regulation of interconnection and interconnectivity** can be explained by externalities between operators. This alludes to mutual termination and standards among operators. It is usually a rather technical matter.

- A third source of market failures is asymmetric information. Many regulations aim to cope with such asymmetries. Examples are **flanking measures** like data protection or safety regulations.

In the remainder of the paper, we will focus on the most prominent topics, namely access to monopolistic bottlenecks and universal service regulations. Sections 2.1 and 2.2 introduce the economic foundation for our discussion in Sections 3 and 4.

2.1 Access Regulation – a Disaggregate Approach

According to the theory of contestable markets, the need for regulation of natural market power might arise where the cost structure exhibits cost subadditivity and irreversible costs (sunk costs) at the same time. The theory has its origins in the work of Baumol et al. (1982). The presence of cost subadditivity and sunk costs is often referred to as “monopolistic bottleneck”. If this bottleneck cannot be duplicated nor substituted by other means, it is called a “stable monopolistic bottleneck” (in US antitrust law this is referred to as an “essential facility”). Such infrastructures give the owner natural market power and potential entrants will not be able to enter the market, even if the incumbent charged excess prices.

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9 In previous articles (Maegli and Jaag, 2009) we developed an analytical framework for the assessment of regulatory governance costs in regulated industries. In this framework we distinguish between direct and indirect costs of regulation: Direct costs occur in relation with the institutional design of the regulatory framework and the behavior of actors. Indirect costs arise because of distorted incentives in the regulated market which result in an inefficient supply of goods and services.

10 See Jaag and Trinkner (2010) for a detailed derivation and description.

11 Subadditivity implies that the cost of producing a set of outputs as a whole are less than the costs of producing the same output subdivided in any combination of subsets. See Baumol (1977) for a precise definition.

12 See Knieps (2000a).
Therefore, in liberalized markets it will be crucial to ensure that new market players get timely, non-discriminatory access to stable bottleneck facilities at reasonable terms and conditions that prevent the abuse of market power. Where competition law is not sufficient to ensure such access, sector-specific regulations are necessary. Thereby, the property rights infringement inherent with access regulations should be minimized to the minimal necessary amount, see Knieps (2000a). There are two main dimensions to minimize the infringement.

First, there are different regulatory instruments to ensure non-discriminatory access, for example ex post or ex ante regulation of access prices, vertical separation, and others. These range from light regulation up to compulsory surrender. See Jaag and Trinkner (2010) for a discussion of various models and a normative approach to assess the right regulatory remedy.

Second, there are various options on how precise the bottleneck is located. Knieps (2000) argues for a disaggregate approach, where only the bottleneck network layers or processes are regulated, all other services remain out of the scope of access regulations. Figure 1 illustrates the relevant network layers and processes in the telecommunications and postal market. Each layer has a specific function in the network. Some layers may be fully competitive while others constitute persistent monopolistic bottlenecks. The starting point of the disaggregate approach is the differentiation between those network layers or processes in which workable (actual and potential) competition is warranted and those in which there is stable market power. The latter must be expected in layers or processes that are monopolistic bottlenecks.

**Figure 1**: Approaches for network analysis: Telecommunications infrastructure vs. postal value chain.\(^{13}\)

<table>
<thead>
<tr>
<th>Telecommunications Network and Layers</th>
<th>Postal Network and Processes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Services</strong></td>
<td><strong>Scope of USO Regulation:</strong></td>
</tr>
<tr>
<td><strong>Physical Infrastructure</strong></td>
<td>- layer 1 and layer 2</td>
</tr>
<tr>
<td>(Technology)</td>
<td>- Telephone and internet facilities and access at affordable prices</td>
</tr>
<tr>
<td><strong>Active Infrastructure</strong></td>
<td><strong>Step 1</strong></td>
</tr>
<tr>
<td><strong>Passive Infrastructure</strong></td>
<td><strong>Step 2</strong></td>
</tr>
<tr>
<td>(Wires and Ducts)</td>
<td><strong>Step 3</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Step 4</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Clearance</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Transport</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Sorting</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Delivery</strong></td>
</tr>
</tbody>
</table>

This implies that both in the telecommunications and in the postal sector, network layers or processes can and should be analyzed separately – notwithstanding the strong connections among the layers. Often, monopolistic bottlenecks are located on layer 1 (the physical network infrastructure usually entailing considerable sunk costs) or in the capillary segments of the network (these segments usually entail subadditivity).

While Knieps (2002) analyzes telecommunications markets by network layers, he argues for postal markets to be analyzed by processes along the value chain. However, this must not necessary be the case: Heitzler (2002?) applies the “layers approach” for telecommunications, in Figure 2 we show that by use of sufficient disaggregation, the postal market can be analyzed both along processes as well as along layers. The result is the same in both approaches; the only bottleneck is the road system, where

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\(^{13}\) Figure based on Jaag et al. (2009).
non-discriminatory access is guaranteed worldwide. Consequently, there will be no need for regulated access in sector-specific postal acts.

**Figure 2:** Bottleneck analysis in the postal market along layers and/or processes

<table>
<thead>
<tr>
<th>Collection</th>
<th>Transport</th>
<th>Sorting</th>
<th>Delivery</th>
</tr>
</thead>
<tbody>
<tr>
<td>Counter collection</td>
<td>Transport</td>
<td>Hand sorting</td>
<td>Home delivery</td>
</tr>
<tr>
<td>Letter drop collection</td>
<td></td>
<td>Machine sorting</td>
<td>PO box delivery</td>
</tr>
</tbody>
</table>

Layer 2, Active Infrastructure

- Counter IT
- Vehicles
- Machines
- Sorting IT

Layer 1, Passive Infrastructure

- Buildings
- Roads
- Buildings
- Roads
- Buildings

When applying the disaggregated approach it is important to investigate carefully the bottlenecks’ stability. If the bottlenecks can be substituted by other means, the bottleneck is not monopolistic anymore and there will be no need for regulation (“substitutable bottleneck”).

With converging telecommunications and postal markets, one market might be a closer substitute for the other than it used to be in the past. Therefore, when considering access regulations, regulatory bodies should have in mind (and understand) both markets.\(^{14}\)

### 2.2 Universal Service Regulation: Internalizing External Effects

External effects are present when one economic agent’s actions affect the actions of other agents. One agent’s action can have positive or negative externalities on other agents. The classical case for a negative externality is a chemical plant which pollutes a river, thereby reducing the prospects of the fishery located downstream the river. In general, when external effects are present, market equilibria are not efficient, as these effects are not taken into account in individual decisions. Where these effects are not internalized, there is room for sector-specific regulations to cope with the market failure.

In the telecommunications and postal markets, various sources of externalities are present which give, among other regulations\(^{15}\), room for universal service obligations (USO). The USO can be explained by the following two types of externalities.

First, there are network externalities among users: 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.\(^{16}\) Similarly, letters as a media are much more attractive if one can reach anyone. Positive network externalities give rise to universal service regulations that aim at connecting everyone to the telecommunications or postal network. Such obligations can be found both in the telecommunications as well as in the postal market.

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\(^{14}\) See section 4 for further explanations.


Second, there are positive or negative externalities onto other sectors of the economy. For example, a new train service will boost a region’s economic activity in many aspects and attract new businesses and residents. Among others, beneficiaries include people who will not use the train connections (for example property owners). Hence, the passengers’ willingness to pay for the future service is too low. As a consequence, such projects often need government support. Similarly, postal services can be seen as “economic enablers”; the interplay between letters, parcels, and payment services is manifold and various external effects are present. Universal service regulations might be needed to ensure the necessary minimal standards. Negative externalities include pollution. For example, full market opening in postal markets will lead to overlapping and parallel networks, thereby potentially increasing pollution (i.e., a negative externality).

Externalities in the telecommunications and postal market are similar in nature. With converging markets, one might reconsider whether it is necessary to tackle USO issues in different and independent sector-specific regulations.\textsuperscript{17}

3. Regulation in Telecommunications and the Postal Sector

Both the telecommunications and the postal sector have traditionally been regulated as publicly owned monopolies. With the introduction of direct competition in these sectors, their regulatory framework has changed considerably.

3.1 Regulation in Telecommunications

Full liberalization in European telecommunications services and infrastructures with delays for some member states has been in place since 1998. According to the interconnection directive (97/33/EC), the general principle for interconnection agreements is free negotiation on a commercial basis. Pricing must be transparent, nondiscriminatory, and cost oriented.\textsuperscript{18}

In the (wire-bound) telecommunications sector, regulation traditionally relies on the disaggregate approach and concentrates on the network layers constituting monopolistic bottlenecks.\textsuperscript{19} The relevant network layers are the wide-area and last-mile passive infrastructures (ducts, cables), active infrastructures (electronic equipment) and services. All last-mile infrastructures exhibit subadditive costs, and can therefore be considered to be natural monopolies. The Commission’s Recommendation (2003/311/EC) mentioned eighteen relevant markets needing sector specific regulation. In 2007, the Commission cancelled eleven markets from the list (Recommendation 2007/679/EC). Knieps and Zenhäusern (2009) argue that there is even more phasing-out potential. They show that only the last-mile ducts and cables are a monopolistic bottleneck which cannot (sensibly) be duplicated.

However, as there is increasing inter-modal competition (e.g., by wireless communication, or by new local loops established by electricity and cable companies) and fast technological progress (fiber optics), the traditional copper bottleneck in the last mile becomes increasingly contested as well. Hence, from an economic perspective, access regulation — which can be phased out eventually — to these temporary (copper-based) bottlenecks is more appropriate than a persistent functional or structural separation since the latter are often considered to be irreversible.\textsuperscript{20} However, once new fiber optics are in place, the fiber local loop might be a stable bottleneck in case consumers tend to demand capacities that can be delivered by fiber-to-the-home infrastructures only. With the emergence of widely used secure mail services and digital identities, electronic communication becomes increasingly a close substitute for postal services. Therefore, regulation in telecommunications also affects hybrid forms of mail.

The inclusion of telecommunications services into the definition of universal service may not only be justified by concerns of structural market power. Cremer et al (2001) provide a series of alternative economic justifications: USO as a remedy for a network externality, USO as a redistribution policy

\textsuperscript{17} See section 4 for a detailed discussion about impacts on regulation and the universal service.
\textsuperscript{18} See Laffont and Tirole (2000).
\textsuperscript{19} See Jaag and Trinkner (2010) and Knieps (2008).
\textsuperscript{20} See for example OECD (2003).
ECPR conference: 'Regulation in the Age of Crisis', Dublin 2010

instrument, USO as a means to supply a public good, USO as an instrument to conduct regional policy.21

The Universal Service Directive (2002/22/EC) relating to electronic communications networks and services addresses universal service obligations and users' rights related to telecommunications in the European Union. The Directive’s aim is to ensure the ubiquitous availability of good quality services via effective competition and choice and to deal with circumstances in which users’ and consumers’ needs are not satisfactorily provided by commercial means. It defines a minimum set of services of specified quality to which all users and consumers have access at an affordable price.

In 2000, OFTEL (2000) stated that “High-bandwidth services do not at present meet the primary test for consideration as part of the USO requirement, because they are not yet services used by the majority.” By now, broadband services are standard throughout Europe. OFTEL 2000 continues: “But they are very rapidly developing. This progress needs to be kept under review alongside other factors relevant to the future of the USO, including the emerging EC framework, impacts on investment, funding, cross-subsidies, consumer demand and means of supply.” In section 4 we will discuss how the convergence in communications markets may be mirrored by according changes in their regulatory environments.22

3.2 Regulation in the Postal Sector

The postal sector is one of the oldest if not the oldest network industry. It is usually not analyzed along the layer framework as in other infrastructure industries. If it were, the only layer exhibiting subadditive costs as well as sunk costs would the road system positioned on layer 1. It is public and open to anyone on nondiscriminatory terms.

A disaggregate approach to postal regulation rather focuses on the various parts of the value chain which consist of collection, sorting, transport and delivery of mail and parcel items.23 Collection and delivery exhibit subadditivity through economies of bundling and hence the characteristics of a natural monopoly. However, there are no irreversible costs. Thus none of these components constitutes a bottleneck resource.

Economics of bundling may play an important role on several stages of letter conveyance. However, alternative entry strategies emerge and can be observed in the sector: high quality letter services (e.g. express mail) as well as large volume mail delivery in selected areas. After the abolishment of all legal entry barriers it is likely that the role of active competition will increase further. As there are no significant sunk costs, there is no bottleneck facility which would justify access regulation or even mandated separation in general.24 Hence competition law should be sufficient to ensure efficient market outcomes. Nevertheless, access to post office boxes or information on change of addresses is often regulated in liberalized markets. Note that these are not monopolistic bottlenecks.

Market failures may arise from network externalities between operators, in analogy to termination issue in mobile telecommunication. In that case, ex-post access regulation and the imposition of universal service obligations might be justified.25 Such regulatory intervention is part of the Third Postal Directive (2008/6/EC): “It is essential to guarantee at Community level a universal postal service encompassing a minimum range of services of specified quality to be provided in all Member States at an affordable price for the benefit of all users, irrespective of their geographical location in the Community”.

21 See also Laffont and Tirole (2000) for foundations of Universal Services in telecommunications.
22 See also Simpson (2004).
23 See figure 1.
24 See Heitzler (2009) as well as de Bijl et al. (2006) for a discussion on access regulation in the postal sector. They conclude: "Our finding that there are no monopolistic bottlenecks in the delivery chain implies that the essential facility doctrine cannot be used to impose downstream access obligations upon the dominant postal operator.”
3.3 Regulatory Authorities in the Telecommunications and Postal Sector

The European trend of establishing regulatory institutions leads toward integrated regulatory bodies. Most agencies are responsible for more than one sector. A multitude of the EU members combine postal and electronic communications in one regulatory agency. In some Member States the postal regulators is also involved in other network industries like gas, electricity, rail or even road safety. Figure 3 summarizes the development in EU Member States and Switzerland. In the following we describe some institutional solutions of cross-sectoral or integrated regulatory bodies.

**Figure 3:** Responsibilities of regulatory Bodies in European Countries

![Diagram showing responsibilities of regulatory bodies in European countries.

**Germany: Bundesnetzagentur**

The Federal Network Agency (Bundesnetzagentur) for Electricity, Gas, Telecommunications, Post and Railway is a separate higher federal authority within the German Federal Ministry of Economics and Technology. In 2005 the regulatory authority for telecommunications and postal services which replaced the Federal Ministry of Posts and Telecommunications (BMPT) and the Federal Office for Posts and Telecommunications (BAPT), was renamed Federal Network Agency. The agency also acts as the root certification authority as provided for by the German Electronic Signatures Act. The Federal Network Agency's task is to provide, by liberalization and deregulation, the further development of the German network industries. For the purpose of implementing the aims of regulation, the Agency has effective procedures and instruments at its disposal including also rights of information and investigation as well as the right to impose graded sanctions.

**France: ACREP**

The ART (Autorité de Regulation des Telecommunications) was created by the law of 1996 to regulate the telecommunications sector. In 2005 the Parliament decided to assign the responsibility for postal service regulation to the authority. Therefore, ART was renamed to ARCEP: Autorité de Régulation des Communications Electroniques et des Postes. The former telecommunications regulator is charged by the legislature with the additional responsibility to oversee the opening and operation of postal markets as well as the financing and safeguarding of the universal service. The new French postal law of 2005 reorganized the statutory and regulatory governance of the postal sector.

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26 See WIK (2009), p. 49.
27 In this preliminary draft we focus on organizational aspects. A Comparison of responsibilities in universal service and bottleneck regulation in both markets is foreseen but not yet realized in this preliminary stage.
28 See http://www.bundesnetzagentur.de
The French postal law (Code des postes et des communications électroniques) covers postal services as well as the electronic communications. 29

Netherlands: OPTA

The Independent Post and Telecommunications Authority of the Netherlands (OPTA) was established in the Netherlands in 1997. What OPTA is allowed and required to do is set out in the Independent Post and Telecommunications Authority Act, the Postal Act and the Telecommunications Act. On its website the regulator states: “The domains of telephony, post, internet and television are changing every day. New businesses are starting up and services are developing in a flash. There is a growing wave of new opportunities and subscriptions. OPTA ensures that there is competition and confidence in the communications sector in the interests of consumers. This mission revolves around two key points: the promotion of competition and the protection of consumers.” 30 Moreover, they conclude that today’s electronic communications will already be obsolete tomorrow. The get together of telecom and postal regulation seems to be motivated by technological reasons rather than by efficiency gains.

UK: Postcomm to Ofcom

Ofcom was established as a regulatory body by the Office of Communications Act 2002. Ofcom is the regulator for the UK communications industries, with responsibilities across television, radio, telecommunications and wireless communications services. 31 In order to analyze the situation of the universal postal service an independent review “Modernise or decline- Policies to maintain universal services in the United Kingdom” was conducted. This “Hooper report” (2008) shed light on diverse risks and uncertainties concerning the future of UK’s postal services. With respect to the shape of the sector-specific Regulator Postcomm and the regulatory regime the report proposes: “Effective competition can help realize a positive future. A new regulatory regime is needed to place postal regulation within the broader context of the communications market. (p.15)” The Hooper report mentioned several arguments for transferring responsibility for postal regulation from Postcomm to Ofcom:

- Postal services are facing competition from digital media and Ofcom has a deep understanding of the entire communications sector.
- Ofcom has experience of regulating markets facing fast technological change
- Ofcom is supposed to have experience of creating a regulatory framework for British Telecom while faced the challenge of modernization and liberalization
- Ofcom is a large organization and has economies of scale in attracting regulatory expertise
- Ofcom has know-how in market analysis and competition law

The relevant postal services bill is currently under discussion and the transfer of the responsibilities has so far not been realized. 32

Switzerland: PostReg and ComCom

A quite unique combination of responsibility is implemented in Switzerland. The Federal Communications Commission (ComCom) is the regulatory authority for the telecommunications market. Established by the Law on Telecommunications of 1997, it consists of 7 members nominated by the Federal Council. The Commission is not subject to any Federal Council or Department directives. It is independent of the administrative authorities and has its own secretariat. 33 The Postal Services Regulation Authority (PostReg) is the regulatory authority for postal market which is not fully independent of the Federal Department of the Environment, Transport, Energy and Communications. The peculiarity of the Swiss solution is the governance structure: Currently, the two regulators are organizationally separated, but they share their chairman.

29 See http://www.arcep.fr
30 See http://www.opta.nl/en/about-opta/tomorrow-is-made-today/
31 See http://www.ofcom.org.uk
32 See http://services.parliament.uk/bills/2008-09/postalservices.html
In the course of the increased substitutability of physical mail by electronic communications means, it is not obvious, how regulation in general and regulatory institutions in particular can and should co-evolve. This will be discussed in the next section.

4. Towards a Unified regulatory regime

In the following we explain how the telecommunications and postal sector converge towards a unified communications market and describe synergies in regulation. Table 1 briefly summarizes various aspects of convergence in the telecommunications and postal markets.

4.1 Converging Markets

Emergence of Electronic Substitutes for Postal Services

In liberalizing postal markets, the concern of cost efficiency arises both for the USP and the regulatory authority, since the monopoly as traditional financing mechanism falls apart. The costs of some elements of the postal universal service are presumably high, therefore, the universal service providers seek for ways to abate them. As a result, an increasing number of postal operators have started to invest in digital solutions to combine them with traditional physical postal services. Current pilot projects include virtual mailboxes (e.g., Belgian Post, Post Danmark, Canada Post), electronic billing or e-government efforts. An important issue is the security of mail and digital identities. Postal operators increasingly aim at installing secure digital identities for their customers to provide safe electronic communication by providing physical insurance of digital means. They therefore provide complementary products and applications based on the network operated by telecommunication providers. The relevant question is whether the universal service will be the same in the future as well as whether the evolving technologies and customer needs change the definition and the role of the universal service. Even though postal universal services might be considered as a fairly unvarying business in the last centuries, a slow but constant change was common in its long history. From Victorian London, where mail delivery routes went by every house up to twelve times per day, delivery frequency has been reduced over the years to five or six times per week. Today, the instantaneousness in communication is secured by electronic means rather than by physical delivery of letter mail. In the coming decade, technological innovation will further expand communication possibilities and as market liberalization impacts postal operators, the operators historical and nostalgic social role is likely to change.

Hybrid solutions, as the following examples show, could herald a new era in postal universal services. Swiss Post established with “Swiss Post Box” a particular hybrid solution as an alternative to the last mile delivery to households. The Finnish Incumbent Itella recently started a similar pilot project testing alternative delivery solutions, where physical mail is delivered twice a week. Arriving mail is stored in a PO Box at the local postal office and receivers are informed via SMS. At the same time the letters are opened and scanned in order to send them electronically to the receiver by means of a special system. Other examples including telecommunication solutions to meet consumer needs and facilitate delivery are the PickPost-Solution of Swiss Post and the PickupPaket of Austrian Post: The addressee is alerted instantaneously when a parcel is delivered at a designated shop defined by the receiver.

These solutions have something in common: Components of the telecommunications infrastructure complement and substitute partially the traditional last mile delivery (e.g. safe electronic mailboxes). On the service level, new services have the potential to substitute traditional universal services (e.g. secured mail). Therefore, separated access and universal service regulations become more and more obsolete. Even though it is as good as certain that the need to deliver to every household and business will remain, the question moving forward will probably be: Is it necessary and efficient to have letter mail delivered every day? In what way? What are the alternatives?

34 See Maegli et al (2007) for further examples.
35 See section 4.2 for a detailed description.
Technological Neutrality

The concept of technological neutrality has been introduced in the telecommunications sector. For example, Japan chose to regulate access to the last mile independent of the technology applied (copper or new fiber wires). Similarly, universal services can be defined technologically neutral.

The concept of technological neutrality has its rationale in the postal sector too. For example, the main needs of recipients concerning postal services are physical and timely delivery. They do not primarily care about how these needs are satisfied as long they are satisfied. That is, the technology used by the operator to fulfill these needs is not primarily relevant for the receiver. In other words, if the delivery of items of correspondence serves the needs of the recipient, independently of different technologies, the delivery is technologically neutral. But do such technologies exist that the delivery becomes technologically neutral?

As mentioned above, there are new services in different European countries that satisfy the customers need for physical and fast delivery. Swiss Post Box, for example, improves physical delivery; it is the secure electronic complement to the physical letterbox. It guarantees a worldwide twenty-four-seven access to the physical mail by scanning and emailing it in a secure unit as soon as it arrives at the sorting centre before it will be delivered. Moreover, customers can decide to have the mail physically delivered, archived or shredded. Managing physical mail during temporary absence becomes as easy as handling electronic messaging.

As a prerequisite, broadband and mobile penetration have to reach a critical mass. Thus, countries and governments that are strategically pushing forward their digital communications infrastructure will gain a substantial and long-lasting competitive advantage. In the case explained above, where mail delivery can be either physically or via hybrid services, universal service is, at least partly, a technologically neutral multi-channel concept. Technological convergence turns the technologies in the two markets to closer substitutes than in the past and functions therefore as the cutting-edge process for a technologically neutral universal service. A technologically neutral universal service has therefore an all-encompassing meaning in the communications sector and could also be referred to the communications universal service, and the according obligation, comparably, the communications universal service obligation. As this move is in line with the changing market reality, new questions emerge: What services should be covered by a redefined communications universal service obligation, and who should pay for?

4.2 Synergies in Regulation

A Unified Communications Market

Electronic communication infrastructures and services allow for a nationwide use of telecommunications services at relatively low rates with for more flexibility in use than in physical communication. At the same time, the national postal providers are mandated by law to provide the cost-intensive postal services to every household nationwide due to the universal service obligation. The European definition of Universal Service in telecommunication services does not include the explicit services and applications but requires the physical connection between households at affordable prices. The disaggregated approach discussed in section two allows for comparison of the two sectors. The examples given in section 4.1 show that two sectors serve similar public goals where the two sectors converge. Table 1 briefly summarizes various aspects of convergence in the telecommunications and postal markets concerning written communication.

As mentioned in the Table 1 the two markets converge in different areas. The most important driver of the convergency is the evolution of consumer needs towards fast access to messages as reliable and secure as possible. Telecommunication network allow for the acceleration of delivery at low costs while physical mail is more reliable but costly. The convergence therefore relies on a combination of the strengths of both means to overcome the weaknesses of the other.
Most European countries have already merged the postal and telecom regulators organizationally in order to realize economies of scale and concentrate expertise as well as experience. But, even if several countries cover the regulation of the two markets in the same bill, the responsibilities are still separated institutionally because the responsibilities for the two markets are completely separated in the different departments. The transposition of regulatory institutions should lead to a unified communication approach in postal and telecommunications, not only from an organizational but also from a regulatory point of view because the historically separately regulated services become more and more similar: (1) Telecom infrastructures are likely to substitute last mile mail delivery and (2) consumers tend to ask for a secure combination of electronic and physical mail.

Table 1: Aspects of converging physical and electronic messaging services

<table>
<thead>
<tr>
<th>Consumer need</th>
<th>Post</th>
<th>Telecommunications</th>
<th>Trend towards convergence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Reliable Written Communication over distances</td>
<td>Written communication over distances</td>
<td>Yes, consumer ask for fast and reliable access to messages</td>
</tr>
<tr>
<td>Product / Technology</td>
<td>Letter Mail and Parcels</td>
<td>DSL, Wireless</td>
<td>Yes, substitution by electronic messaging</td>
</tr>
<tr>
<td>Frequency of service</td>
<td>One per day (5 to 6 days per week)</td>
<td>Continuous</td>
<td>driver for convergence -</td>
</tr>
<tr>
<td>Speed</td>
<td>Low Trend: Lower (fewer deliveries per week)</td>
<td>High Trend: Differentiated (net non-neutrality)</td>
<td>driver for convergence</td>
</tr>
<tr>
<td>Coverage</td>
<td>Nationwide</td>
<td>Nationwide</td>
<td>-</td>
</tr>
<tr>
<td>Reliability</td>
<td>Reliable</td>
<td>Unreliable</td>
<td>Yes, by digital IDs provided by postal operators</td>
</tr>
<tr>
<td>Confidentiality, integrity</td>
<td>High</td>
<td>Rather low</td>
<td>Yes, people trust in reliable brands of postal operators</td>
</tr>
<tr>
<td>Price</td>
<td>High Trend: higher</td>
<td>Low Trend: lower</td>
<td>driver for convergence</td>
</tr>
<tr>
<td>Accessibility</td>
<td>Postal retail outlets or post box criteria based on distance</td>
<td>All residences and business offices on request</td>
<td>driver for convergence</td>
</tr>
<tr>
<td>Scenario for USO reform</td>
<td>Reform in delivery models and frequency</td>
<td>Electronic convergence (fix and mobile infrastructure) or technology neutrality Increased minimum speed</td>
<td>Yes, by hybrid services</td>
</tr>
</tbody>
</table>

The trend towards integrated cross-sectoral regulatory authorities should facilitate this development: The increasing convergence between postal products and telecom applications is a new phenomenon which needs an according co-evolution of regulation in order to exploit synergies and find proper universal service definition in line with changing customer needs. Hence, rethinking the USO is necessary and makes sense. In the following we discuss the possible impacts of the converging markets on the currently separated definitions of Universal services.

A Unified Approach

The idea of a unified communication universal service obligation mentioned above underlies a holistic understanding of the topic, which will end in a clear need for a unified regulation approach. Such an approach consist of a general universal service part and a part for bottleneck resources, similarly to the layer framework in the telecommunication market.

The general part of the unified approach is built on the basic idea of universal service obligations to safeguard the public’s access to a minimum range of basic services that markets are not able to provide at uniform or reasonable price. Under the concept of a communication universal service obligation, no matter how quickly communication technologies change, the right to a minimum level of

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36 See section 3.3.
37 Partially adopted from IPC (2010).
communication is of high importance for the economic development of a society. Therefore, a generally outlined part of the unified approach consists of the basic principle of having the possibility to communicate from senders to receivers no matter whether physical or electronic.

Following Knieps (2000), bottlenecks should be given regulated access to for all competitors, no matter if it was formerly financed by the state or by one or more competitors. As shown in Figure 2, this applies only for roads in the physical postal production process, where non-discriminatory access is guaranteed. Furthermore, roads are not in scope of universal service regulation. In the telecommunications layer framework, only the passive infrastructures in the first layer (last mile cables, ducts or mobile radio infrastructure) constitute a bottleneck facility. Figure 4 summarizes the unified approach. The universal service is defined in layer three and regulates the physical electronic transport of messages from senders to receivers whilst bottleneck regulation is implemented in the layer 1 where needed.

But how could it work in practice? Remember the example with Swiss Post Box. If receivers are connected to a broadband network, they can receive the digitalized letters via email instantly. The physical delivery with a combined bundle of items happens two or three times a week, depending on the definition of the communication USO. With this combination of physical and electronic mail, the customers need for physical and fast delivery is satisfied. For the special case of high value or emotional value mail as for example love letters, or for the case of very urgent mail, it is still possible to pick the item at the PO box.

Hence, the unified approach is not a solution that replaces all letters and cards; partly, it's creating communication that might not have occurred otherwise. Most importantly, many people remain more comfortable with paper. The most important benefits of such an approach is its convenience, the speed of trusted communication, its low cost, increased consumer choice, and the reduced environmental impact due to the avoidance of unnecessary paper exchange and transports.
5. Conclusion

Conclusions will be provided after the conference

6. Literature


Jaag et al. (Sunrise)


