

Liberalization and Regulation of Postal Services and Markets

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General Introduction

Despite rapid technological progress in electronic communication technologies and changing user habits, modern postal services remain one of the essential services for a modern information society economy as a whole to run smoothly and efficiently. Although the liberalization and the related privatization of formerly state-owned incumbent telecommunications operators from the year 1984 on received much more attention due to the drastic gains from massively falling prices and increased choice for consumers, the development of the postal sector is of similar importance. Even in the European Union with a very well developed information and communications technology sector, the postal operators still are responsible for about 0.7% of total gross domestic product and 0.5% of total employment. Further factors which likely contributed to the lower attention for postal liberalization are *i)* that postal markets have been effectively opened up ten to fifteen years later (for example, in the EU, the process started with the European Commission's publication of the Green Paper on the Development of the Postal Market in the year 1992 and led to the first postal directive in the year 1997, requiring the member states to open up their formerly monopolistic markets not before 1999) and *ii)* that the technological advances in this sector happened largely invisibly for most of the users of postal services: Letterboxes, envelopes and stamps remained largely unchanged over time.

Traditional Regulatory Approaches and Postal Services

For the liberalization of the postal industry, it could often be observed that the telecommunication frameworks have been used as a starting point. However, although both industries are network industries with the according economies of scale and scope, there are significant differences which do not allow to simply transfer the regulation of either of the industries to the other one. Especially the view that regulations concerning the access to competitors' networks should also be applied to the postal industry improperly reflects the characteristics of postal networks.

The first chapter shows, that while the underlying rationale, namely the existence of natural monopolies and essential facilities leading to entry barriers and the inefficiency of unregulated competition has been constituted correctly for the telecommunications sector, fundamental assumptions to justify such regulatory interventions are not fulfilled in the postal industry.

Following from the different characteristics of postal networks, the concentration of demand with very few large companies and institutions sending the largest share of all mail (and thus being in a favorable position to negotiate appropriate prices) and from the existence of strong intermodal competition (allowing demand-side substitution), price regulations should also be applied more sparsely than in the telecommunications sector.

The Impact of Regulation on Postal Markets

The second chapter assesses the influences of regulation on letter mail volumes and revenues, as well as other factors' influence on employment. The results coincide with the existing literature, although the effects which can be seen from existing data appear to be very small. The strongest confirmation, we can give, however, is the importance of coporatization for the national postal operators to become efficient. Regulation might have a smaller impact on the development of the postal industry than it has in the telecommunications industry.

It is often assumed, that the reasons for that are, that sender and user preferences play a much more important role in determining the market developments, that – despite a growing number of alternative communication means evolved over time – the substitution declines over time, leading the demand to become more and more inelastic and thus non-responsive to policy changes, or a combination thereof. In addition, with declining letter mail markets, advancing automatization and increasing cost, potential entrants might be discouraged to enter postal markets, again limiting the effectiveness of policies that aim to foster competition.

Social Regulation: The German Postal Minimum Wage Case

Although *economic* regulations might have only limited impact, the German case of the introduction of generally binding minimum wages for the postal industry provides a good example how large the impact of *social* regulation can be, given the relatively large share of labor cost and the difficult economic conditions to compete in the letter mail market. Chapter three illustrates the drastic impact of the introduction of minimum wages base on a wage agreement between the

incumbent and a union on competition. Although the regulation intended to protect the postal workers from unintended side effects of liberalization, competition has been impeded by raising the cost of operators which did not operate on the same scale and thus with lower margins. The well-meant instrument to limit wage erosion and to establish a level playing field between the operators turned out to be a very effective instrument to deter competition. Moreover, in one case, it contributed to force one of the competitors out of the market.

A Model of Raising Rivals' Fixed (Labor) Costs

Since the famous Pennington case seminal article of Oliver Williamson it is well known in the economic literature that a monopolist and the unions might have an incentive to raise wages in order to limit entry or force rivals out of the market. In the forth chapter, we analyze the bargaining problem of an incumbent firm and a union when the wage contract becomes generally binding with particular relation to competition among operators of mail delivery networks and thus the German case which is described in the preceding chapter. We highlight the raising rivals' cost incentives and the consequences resulting from labor laws that make such collective agreements generally binding. We show that minimum wages implemented by means of extension regulation are an effective deterrence instrument which frustrates both, market entry as well as investments into the build-up of a mail delivery network.

Taking together the insight from the two chapters on minimum wages, the lesson learned is that social regulation should be applied very cautiously and balance the interests of existing players and potential entrants.

Modernizing the Postal Universal Service

Finally, chapter five bridges the past and the future. During the last 25 years, the rapid advancements in information and communication technologies (ICT) led to far-reaching implications not only for the industries involved but also transformed the whole society. Electronic alternatives to traditional postal products and services have led to substantial shifts in the mail mix and to significant substitution of products due to rapidly declining prices and increasing variety and quality. Nevertheless, while the universal service obligations (USOs) in the telecommunications sector are under discussion with regard to broadband access, the postal USOs remained basically unchanged despite the increased competition not only from new postal operators but also from electronic substitution which further increases the competitive pressure on the established operators.

This chapter discusses the development of the USOs in the two industries, and links them to the recent developments including the EU 2020 strategy which aims for smart, sustainable growth with access to high speed internet for all Europeans. Considering in addition the potential replies to these industry challenges, it becomes clear, that not only the telecommunications USO, but also the postal USO should be re-evaluated and re-designed in order to account for the existing interdependencies on the wider communication market. Thereby, especially the differences in the developments between urban and rural areas suggest considering approaches that differentiate between their respective specifics and pay more attention to the underlying cost characteristics.

Chapter 1

Traditional Regulatory Approaches and Postal Services

Postal services are an important part of modern economies' communication and distribution infrastructure. They provide a distribution system for information and goods that connects communications and logistics, and often add important financial services to support economic transactions. Numerous industries such as the e-commerce, banking and insurance, and advertisement and marketing industry directly or indirectly depend on the postal industry.

Stepwise market liberalization and privatization of former public postal monopolists pursue the goal to enhance the efficiency of the postal service sector. The creation of a level playing field that ensures fair competition is an important element of the liberalization process. The general trend to introduce competition in the postal industry is possibly most visible in Europe. Since the European Commission published a Green Paper on the development of the internal postal market (EU 1991), the reserved monopoly areas of public operators were reduced three times (1999, 2003, 2006), and the Europe-wide full market opening is envisioned by the end of 2012 at latest.

In the telecommunications industry, regulation is based on the existence of fundamental market failure in network industries due to network effects in combination with natural monopoly properties and large sunk costs which lead to substantial barriers to entry. Regulation basically is justified by the economic rationale that it is impossible to achieve efficient competition under these conditions. Access regulation is based on the identification of essential facilities (or *monopolistic bottlenecks*) and aims at providing efficiency incentives for the incumbent firms and inducing (efficient) entry and competition in the remaining potentially competitive parts of the industry. Accompanying retail price regula-

tions prevent the abuse of monopoly power in retail markets which are dominated by the former state-owned monopolists.

Recent trends in the EU show that postal service markets are likely to be regulated as if they essentially shared the characteristics with the telecommunications sector. The alleged similarity, however, disappears when we study technological and economic features of postal service markets precisely.

In the following, the two instruments *downstream access* and *retail price regulation*, typically used in telecommunications regulation, are discussed and assessed from the postal sector perspective. Our comparison provides transparent illustration of the differences and allows to highlight the specifics of postal markets.

1.1 Network regulation

1.1.1 Competition and economic efficiency

In principle, competition is expected to lead to economically efficient allocations with respect to both static and dynamic efficiency. The underlying reasoning is based on the firms' incentives to maximize their profits as well as a number of additional assumptions concerning the market structure and the firms' conduct.

First, in order to avoid monopolistic and thus inefficiently high consumer prices, each firm has to face either actual or potential competitors. Low entry barriers as well as the firms' ability to use the same or similar technologies are basic conditions which have to be fulfilled in order to guarantee that competitive market allocations are efficient.

Second, consumers need to have sufficient information about the firms' prices and the qualities of the products they offer.

Finally, a number of further conditions concerning the functioning of the legal system have to be satisfied. That is, the enforcement of agreements has to be ensured in order to allow the parties to write enforceable contracts that circumvent potential commitment problems and moral hazard through conditional clauses.

Whereas the just mentioned conditions are crucial for static efficiency, dynamic efficiency is based on efficient investment decisions and timing with respect to both process and product innovations based on the firms' expectations to gain competitive advantages vis-à-vis their competitors and to earn at least temporarily supra-competitive profits. The analysis of investment decisions in risky environments and taking into account those firms' incentives to invest are

based on the potential gains from innovations and reveals that there is basic trade-off between static and dynamic efficiency.

Hence, to reach dynamically efficient competition, innovations have to be protected such that potential profits are high enough to give the firms the right incentives to undertake risky investments in order to develop new technologies or products. Although this basic conflict between static and dynamic efficiency cannot be solved in a first best manner, it is generally assumed, that decentralized innovation processes driven by expected gains from temporarily limited dominant market positions are the most efficient way to solve the related investment problems.¹

1.1.2 Network industries

Traditionally, nearly all network industries, e.g., telecommunications, electrical energy supply, railways, water supply and disposal, and postal services, have been assumed to be characterized by technologies with subadditive cost functions.² This view had led to the provision of the respective services by protected private monopolies, public owned enterprises or directly by public administration entities. Over time, views changed and competition is now supposed to lead to more efficient allocations in large market segments. The basic argument for this new approach rests on the idea that many production processes are vertically structured. Basic infrastructures like telecommunication cables or electricity grids are inputs for the products and services to be carried over the networks.

Consequently, the current approach emphasizes that production processes have to be considered such that competition should be introduced in all market segments where the respective production technologies allow for competition. More specifically, monopolistic provision of inputs should be reduced to market segments where *essential facilities* (or *monopolistic bottlenecks* as a slightly weaker justification for regulation) exist. Essential facilities are inputs that are unconditionally necessary to provide certain goods or services and that are unfeasible or too costly to be duplicated or to be bypassed.³ At the same time there must not exist sufficient demand side substitution possibilities for the ser-

¹Concerning innovation dynamics, cf. Schumpeter (1918/1964). The question about the relationship between market structure and innovation incentives dates back to Arrow (1962).

²For a formal definition of subadditivity, cf. Baumol, Panzar and Willig (1982, p. 17).

³Cf. Bergman (2002, p. 110). The foundations of the essential facilities concept originally was developed in the 1912 U.S. Supreme Court case *United States v Terminal Railroad Association of St. Louis* (224 U.S., 383).

vice itself. Shortly, essential facilities not only have to be non-replicable but also non-substitutable with regard to the service they are needed for.

1.1.3 Networks and regulation

Following the idea that competition leads to efficient market allocations whenever the conditions mentioned above are met, regulation should be confined to market segments where essential facilities exist. That is, regulation should address the industry specifics that lead to market failures, limit the firms' exercise of market power and try to prevent abusive conduct of market dominance.

Access regulation

The basic idea of access regulation relies on the concept of essential facilities. If the provision of goods or services is based on the use of essential facilities, the right to use these facilities should allow for competition in all other market segments. If firms face the same conditions to use the respective essential facilities, there exists a level playing field such that market entry and actual or potential competition between firms leads to efficient allocations.

Thus, access regulation tries to combine competition in potentially competitive market segments with a regulated monopoly where it cannot be avoided (or where a legal monopoly is granted). Access regulation grants competitors access to elements or parts of the production chain. Table 1.1 provides some examples for regulated access in network industries.

Table 1.1: Examples of downstream access in network industries

Industry	Downstream access to	Competitive segment
Electricity	Distribution grid	Generation
Rail transport	Rail tracks	Transport operations
Telecommunications	Local loop ¹	Long distance networks
Water	Supply and disposal	Treatment

¹ Under Calling Party Pays regime, call termination is also an essential facility.

Source: modified from Haucap and Dewenter (2007, chapter 1).

In all cases, the starting point for access regulation is imperfect competition based on the existence of a monopolistic bottleneck and the observation that even if the owner of the monopolistic bottlenecks is not vertically integrated,

unconstrained monopolist behavior would lead to an abuse of the monopolistic market power and thus inefficient allocations.

Additionally, the introduction of competition by means of regulated access might be desirable even at a loss in economies of scale and increased overall costs⁴ mainly for two reasons (Laffont and Tirole 2000, p. 100):

- Competitors might offer differentiated services, improving the match with consumer preferences, and
- they might offer existing services at lower prices due to lower (downstream) production costs, e.g., for retailing, and due to lower profit margins.

Downstream access regulation therefore pursues a dual purpose: First, it aims at improving the incumbent operators' incentives for efficiency and, second, it aims at encouraging (downstream) competition (Laffont and Tirole 2000, p. 37). Access policy has to balance the efficient use of existing networks and entry including successive investments in complementary assets and efficient bypass in order to achieve the market structure being most efficient in the long run (Vogelsang 2003).

Instruments and access charges

In cases where access regulation is introduced, access (and resale) obligations include a wide range of possibilities that are asymmetrically imposed on the owner of the essential facility.⁵ Regulated access implies not only non-discriminatory access to physical resources and corresponding pricing to effectively lower entry barriers. In order to ensure a level playing field, further remedies may be necessary. To address the problem of exclusionary abuses, even more intrusive additional structural measures like divestiture obligations (also called "ownership unbundling") might be used. In any case, access regulation cannot prevent dominant positions and only reduces the incentives for anti-competitive conduct. The effectiveness of access regulation depends to a large extent on the national regulatory agencies' monitoring effectiveness.

Considering the design of access charges, the main problems are to encourage efficient third party entry, and encourage efficient network investment and network utilization, while being manageable (Vogelsang 2003, p. 832). The two major problems concerning access charges are based on *i*) the observation that

⁴Overall costs might increase furthermore from technical and organizational co-requirements.

⁵Symmetric downstream access usually is applied in cases where access to the final users is needed, as, e.g., in the case of termination monopolies. In these cases, the distinction between one-way- and two-way-access depends on the characteristics of the access-seeking firm.

deviations from marginal cost pricing are necessary in order to ensure that the regulated parts of the network can be operated profitably and *ii*) the fact that any distortions due to imperfect competition on downstream markets have to be taken into account as well.

Focusing on the first problem, theoretically optimal access charges are based on the classical *Ramsey* rule. Such access charges minimize the efficiency loss due to their inequality to the marginal cost of getting access. They are based on both marginal costs as well as the properties of the demand functions in downstream markets. However, the informational requirements of such access charges as well as the necessity to adapt access charges whenever demand or cost change imply that they cannot be implemented without high costs of the regulation itself (Neu 1993).

For the determination of the level of access charges, one has to decide between historic cost and forward-looking cost. While cost measures based on historic costs guarantee that the incumbent's actual costs can be covered, the related access charges may lead to inefficient investment decisions of competitors. For example, with technological progress and decreasing network costs, they tend to induce too much investment by competitors inasmuch historic costs and thus the respective access charges are higher than the actual opportunity costs (Armstrong 2002, pp. 334-337).

Vogelsang (2003) provides an extensive overview of the related literature concerning access regulations and the calculation of access prices, which is briefly summarized in the following paragraphs:

Access charges based on forward-looking costs (FLC) mitigate this problem since costs are calculated such that they reflect the costs for setting up the respective infrastructure at the moment. However, with costs that are decreasing over time, FLC imply that the actual costs of the regulated firm might not be fully covered. Furthermore, compared to historic costs, FLC induce higher risk for the regulated firm. FLC are subject to technological uncertainty and thus increase the uncertainty with respect to future access charges. Both cost variants neglect *ex ante* risks with respect to future demand. Therefore, they are not able to capture the option value of waiting that is relevant for investment decisions under uncertainty.

Moreover, linear access charges based on simple costs measures ignore potential economies of scale and scope from providing access either for large scale competitors or for competitors who use different modes of access. If price regulation gives the regulated firm the right to choose relative access charges as well as

non-linear access charges, these mechanisms also imply that the regulated firm will distort its access charges in order to increase its profits from either providing access or from distorting downstream competition: Rate of Return (RoR) regulation implies that relative access charges tend to be distorted in favor of relatively capital intense access services. Price cap regulation provides the incentive to use non-linear access charges with inefficiently high fixed fees and large quantity discounts.

Additionally, access charges under both types of regulation are vulnerable to strategic manipulations concerning downstream competition. Under both regulatory approaches incumbents can choose their access charges such that access in specific market segments is unprofitable. Hence, Rate of Return regulation and price cap regulation both have to be complemented by non-discrimination obligations and (single) price controls.

Overall, it turns out that it is not possible to develop theoretically optimal access prices that rely on costs only. Hence, while commonly used cost measures have the advantage of relatively low informational requirements, they are not appropriate if efficient investment decisions under uncertainty with respect to technological developments and future demand are considered. Ignoring risk and the appropriate option values leads to inefficiently low access charges and therefore to inefficiently low investment incentives.

Retail price regulation

At first glance, retail price regulation seems to be dispensable if access to essential facilities is regulated. Providing a level playing field, access regulation alone should suffice to ensure competitive market allocations on downstream markets. However, this reasoning is correct only if one adheres to the assumption of perfectly competitive downstream markets. In this case, retail prices would be equal to the charges for the required access services plus the costs for the provision of the respective downstream products or services.

These results change drastically if imperfect competition on downstream markets and dominant market positions of vertically integrated incumbents are considered. Then, retail price regulation serves the following two purposes:

- Deterring the dominant firm from abusive practices on downstream markets.
- Re-aligning price distortions induced by regulatory interventions.

While inefficiently high price levels point to monopolistic price cost margins and predominantly harm consumers, distorted price structures as mentioned

above can serve to extract additional consumer surplus and to harm potential competitors.

On the one hand, non-linear tariffs with properly adopted quantity discounts serve as simple means to differentiate between heterogeneous consumers with different willingness to pay. On the other hand, bundling effects induced by non-linear tariffs which include more than one product can also serve as instruments to deter entry by small scale competitors, e.g., if quantity discounts depend on the sum of products purchased. The potentially anti-competitive effects of non-linear tariffs in combination with bundling or tying are reinforced if access regulation is based on simple linear access charges that render large quantity discounts unprofitable for competitors, thus limiting their feasible offer range, e.g., making flat rate offers unprofitable.

Rate of Return (cost plus) regulation

The two most important approaches for price regulation were Rate of Return (RoR) and price cap regulation. Under RoR regulation, the regulated firm is only allowed to recover the costs and to achieve a “fair” rate of return on capital. In practice, setting prices requires an enormous amount of data. Additionally, the regulator sets the prices for all of the goods and services provided by the regulated firm besides its rate of return (Guthrie 2006, p.930). Although they are in principle set such that distortion of consumer behavior is minimized, often the regulated firm provides universal service and the retail prices are regulated also to achieve social goals, e.g., urban-rural and usage-fixed cross-subsidization.

Overall, the revenue requirement has to be calculated as the sum of the operating expenses, depreciation, taxes and the rate of return times the eligible asset base. It has to be noted, that the costs are the actual embedded costs, not forward-looking costs. For calculating the revenue requirement including a “fair” rate of return, multiple difficulties arise: *i)* in multiproduct firms, the asset base and costs have to be allocated to the different products, which is further eschewed if accounting rules for public entities apply and *ii)* the calculation of the cost of equity becomes central (cf., e.g., Lamdin 2003).

Price cap regulation

The price cap regulation approach uses long-run forward-looking cost estimations for single products, or product baskets in combination with a weighting scheme, based on a hypothetical efficient firm or (more rarely) benchmarking. This approach allows the regulated firm to adjust its own prices subject to the weighted

average of prices not exceeding a defined cap. Because the prices are disconnected from actual costs and the price ceiling is fixed for a certain period of time, the firms can keep additional profits from cost savings, and therefore price cap regulation provides effective incentives to lower costs (Sappington 2002, p. 3.).

Flipside of the coin is that this incentive also leads to quality reduction incentives. This can be illustrated, e.g., with a case in the UK, where severe phone booth maintenance problems arose. To achieve service quality targets, often the incorporation of service quality assessments, or quality provision sanctions, and/or incentives (which allow higher prices for better services) shall encounter this, but require co-regulation.

Another disadvantage is the danger of regulatory taking, which refers to a situation where regulation effectively uses the government's eminent domain power without actually divesting the property from the property's owner. Examples include the lowering of the price cap *ex post* in order to take the profits from the regulated firm, if they were considered as excessive. In addition to the drawback, that unexpected cost increases have to be borne by the firm, it further increases their risk expectations, which in turn leads to even higher necessary expected profit margins for investment than in cost-plus regimes required.⁶

Over time, the price ceiling has to be adjusted to inflation and productivity developments, which first requires the choice of a measure of the rate of inflation for the goods purchased by consumers. For this purpose, either a Retail Price Index (RPI) or a Consumer Price Index (CPI) is used. The so-called X-factor in the common RPI-X formula reflects productivity developments and plays also an essential role.⁷ The design of this factor might increase policy credibility and reduce regulatory capture, if it employs the productivity gains relative to other sectors in the economy and input price inflation in a way, such that discretionary options for the regulatory agency are limited effectively, and regulatory uncertainty, the probability of renegotiation attempts and other might-be rent-seeking activities are reduced.⁸

Not only retail price regulation may in fact be necessary if access charges are not in line with the actual costs of using the respective network elements or services and if downstream markets are not perfectly competitive. Additional measures like the imposition of replicability standards, restrictions concerning po-

⁶“Given that firms are more risk averse than the buyer (perhaps the government or the collective of all consumers), this risk transfer is in itself inefficient. It follows that the optimal regulation can then be seen as a trade-off between an efficient risk allocation and good incentives for cost control (the “incentive - rent extraction trade-off”)“ Bergman (2004, p. 19).

⁷The RPI-X formula first was proposed as a policy innovation by Littlechild (1983).

⁸For a detailed discussion of the X-factor, cf. Baake and Wey (2007b).

tential price cost squeezes as well as obligations concerning the offer of unbundled products and services are necessary to prevent (vertically integrated) dominant firms from abusive practices on downstream markets.

These conclusions continue to hold if retail prices are regulated according to either type of regulation. Since Rate of Return regulations as well as price cap regulations mainly focus on the price levels they are not designed to deal with anti-competitive effects. Similar distortions can arise under RoR regulations. Whereas different elasticities of demand are crucial under price cap regulation, RoR regulations provide strong incentives to offer capital intense products at prices that are below the (undistorted) opportunity costs of competing firms. This results from the return rate constraint and the possibility to retain high market shares and at the same time keeping profits low in competitive areas in order to be allowed to extract higher profits from non-competitive market segments.

1.1.4 Summary

The modern approach to regulation of network industries relies on the notion of essential facilities and the idea that competition should be allowed wherever it leads to efficient market allocations. A closer look at the implied regulatory necessities shows that the actual implementation of efficient regulations is rather demanding. Considering dynamic efficiency reveals that simple cost based access charges lead to inefficient investment incentives as long as uncertainty about future developments of technologies and demand is taken into account. Moreover, the relation between the optimal regulation of access to existing infrastructures or essential facilities and the incentives to invest in bypass technologies is even theoretically a still unsolved problem.

Assessing actually used regulations like linear access charges based on forward looking costs and price cap regulation in downstream markets shows that these mechanisms lead to additional distortions and potential inefficiencies. This is especially true if downstream markets are not perfectly competitive. In order to prevent regulated incumbents from abusing their dominant market positions simple regulatory mechanisms have to be complemented by additional obligations which are specifically targeted at the regulated firm's incentives to extract consumer surplus and to restrain competition.

Therefore it becomes questionable, whether access regulation is an appropriate default answer for network industry frameworks, especially if largely unregulated

competition would be feasible, e.g., through technological progress or in the form of intermodal competition.

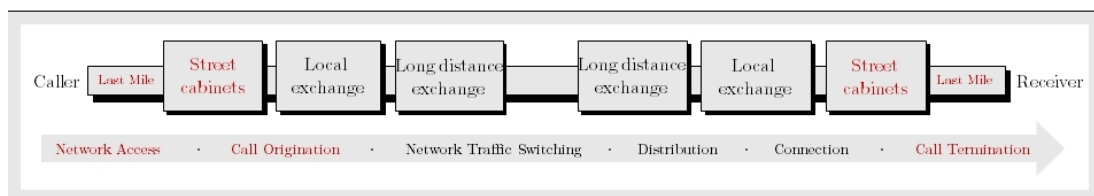
1.2 Downstream access

1.2.1 Economic rationale and implementation in telecommunications

*“The fundamental problem of all communications policy is the access network, also called the last mile or local loop.”*⁹

For illustrative purposes, the bottleneck elements within the telecommunications value chain are illustrated on basis of (fixed network) voice telephony. Voice telephony consists most basically of the services call origination, call switching including connection, and call termination. All of these services fundamentally rest on physical network access over the *last mile* (the local loop) as well as on a suitable *addressing scheme*. The last mile consists of the connections to the network in the street cabinets and the access lines between the street cabinets and the customer premises. Therefore it represents the crucial gateway for service provision. Figure 1.1 illustrates a typical telecommunications network.

Figure 1.1: Telecommunication networks and related services



* The last mile, street cabinets, network access, and call origination and call termination usually are identified as (local) natural monopolies for a (given fixed) network technology.
Source: DIW Berlin

Additionally, telephony networks are service specifically optimized infrastructure-tied networks (such as electricity, railway and water networks). Services are provided over an electronic network which starts at the end user device interfaces in the facilities of the customers and connect the users bidirectionally over street cabinets, local and long distance exchanges which

⁹Hundt and Rosston (2006, p.1).

are permanently physically connected. To install such a network, substantial construction work is required in order to set up the facilities required. Once in place, the subsequent costs are largely independent of the actual network usage.

Usually, the last mile is considered to represent an essential facility, while undisputedly being a natural monopoly (for a given fixed network technology) and the least replicable input. Whether monopolistic bottleneck elements in the telecommunications are true essential facilities or “near-essential” facilities (CRTC 2001), depends not only on the costs for duplication given of the technology used, but in addition on the extent, to that the costs are indivisible sunk investments, and on demand conditions.

Economies of scale, scope, or density by themselves might create a natural monopoly and high entry barriers, but are not sufficient to constitute an essential facility. Usually, one-way access regulation does not rest on the rigorous criteria of essential facilities but rather on the identification of SMP of the network operator and the expected gains from introducing competition to potentially competitive segments.

Especially in highly dynamic industries like the telecommunications industry, two additional aspects arise: First, technological progress might increase the replicability of certain assets, in extreme making essential facilities obsolete, or, more moderate, bottlenecks or possible access points might change with the evolution of technology. One example for this phenomenon can be observed in UK, where the evolution of BT/Openreach’s legacy telephony network to the *21CN Next Generation Network* reduced the network by one layer and, as a consequence, changed the geographical network structure including the location of access points as well as the technically viable options for access to the network (Ofcom 2004, pp.17-19). In this case, the reluctance of competitors to the existing network and the related path dependencies led to the need to deal with compensation claims from competitors due to stranded costs from specific investments in infrastructure complementary to BT’s former network.

Service competition

Telecommunication networks provide a wide range of possibilities for mandated access, which generally can be classified according to the requirement for entrants to build their own infrastructure, the extent of control over the customer’s local loop, and whether they are considered as a transitory step towards facilities-based competition or intended to be permanent regulation. While the entry strategies and business models that become possible are closely related to the scope of the

regulation, both, service competition and access-based infrastructure competition might be limited with regards to the possibilities to offer differentiated products.

Call-by-call and carrier preselection, where price competition, e.g., based on cost or strategy advantages in marketing, is focused, are widely considered as important step stones to introduce competition and to allow consumers to “try” competition with low switching costs, they were also responsible for technically inefficient (re-) routing and a lack of technological innovation.

As unbundling and line sharing were dominated by wholesale offerings in the beginning, infrastructure investments were not really observable (Hundt and Rosston 2006). Champeaux, Hennes and Lebourges (2006, p. 161) confirm this view, stating that “the 1998 telecommunications liberalization [...] (has) a doubtful record on productivity, innovation and sustainable entry. Concerning unbundling and wholesale obligations (there have to be noticed) negative results for industry conduct and performance”, as, e.g., a stop of network growth induced by significantly increased monthly charges. In some countries, less than half of the household are subscribers to a fixed line network, which today causes significant problems concerning internet access penetration and usage.

Facilities-based competition

Access to ducts, local loop unbundling, naked DSL, line sharing, and bitstream access are the regulatory policy options that require facilities-based entry. Unbundling has been introduced 1996 in the U.S. with the Federal Communications Act (1996) 47 U.S.C. §§ 251-252 as well as in the EU with the Directive 96/19/EG, two of the most important legislations in the history of telecommunications regulation. Within the EU, in the meanwhile a directive dealing exclusively with unbundling and interconnection was added to the regulatory framework (EU 2002a). In both frameworks, fair charges are mandated and non-discrimination as well as transparency rules apply. The selection of elements eligible for access in both legislations is based on the concept of significant market power (SMP). Furthermore, with the exception of Mexico, in the meantime all OECD countries require some form of local loop unbundling (LLU, as downstream network access usually is called in telecommunications), although with a widely varying scope of the obligations imposed (OECD 2007, pp. 53 ff.).

The theoretically predicted difficulties arose in all areas, concerning the discrimination incentives between competing firms (especially the question whether to prevent the rollout of competing networks with low access prices), concerning mutual dependencies, as illustrated above for the 21CN restructuring case, and

that with complementary assets, investment and innovation are expected to be higher for vertically integrated systems. Additionally, fierce discussions of the access terms (on prices, qualities, requirements) and extensive renegotiation attempts could be observed.

Considering the access pricing, according to the U.S. *Total Element Long-Run Incremental Cost* (TELRIC) approach, a rate for each network element is calculated. Thereby the approach ignores the fact, that the lack of compensation for investment risks is anticipated by investors, thus leading to underinvestment. At least, to account for historical decisions (and related path dependencies), in some cases certain elements of the network are considered as given instead of being variable, e.g., the network node buildings.¹⁰ Generally, access obligations and the related price controls have high information requirements. Hence, the best choice strongly depends on the incentives and ability of the regulatory authority to carry out the related analysis methods.

Additional requirements

With access regulation, overall costs increase additionally from technical and organizational co-requirements, e.g., from the implementation of accompanying co-location space, access management services and measurements to reduce switching costs (like number portability). Also, in most cases behavioral remedies to the problem of bottleneck governance are unlikely to be successful in eliminating anti-competitive practices, especially in the case of deteriorate access quality, long service request response times and other non-pricing anticompetitive behavior (Lyon 2000, p. 79).

Vertical separation

Following the logic to separate monopolistic and competitive market segments, the most consequent measurement is structural or vertical separation that re-establishes a separated monopoly which can be interpreted as an access obligation with the extended requirement of ownership divestiture. In infrastructure based networks, one central issue often is to what extent vertical integration should be allowed. Vertical integration alters the industry performance by changing the composition and the nature of downstream competition (direct welfare effects),

¹⁰Similarly, the EU the *Cost of Efficient Service Provisioning* are calculated (which can be regarded similar to a *Total Service Long-Run Incremental Cost* (TSLRIC) approach). Both concepts share the attempt to determine the (hypothetical) costs of an efficient cost-minimizing firm with an optimally configured network built with an efficient technology. For a more detailed discussion, cf. Vogelsang (2003, pp. 840 ff.).

where retail supply can enhance competition and by affecting the incentives to discriminate (indirect welfare effects) against rivals.¹¹ Thereby, the merits of vertical divestiture vary with type and competition in the retail market, scale and scope economies, relative social value of consumer surplus and profits. The empirical evidence varies strongly for different industries, countries, and firms.

A further point concerning vertical separation is, without full ownership divestiture, that if it is correctly implemented, the upstream company is effectively shielded from competitive market forces, if not, discrimination incentives remain (Sappington 2006).

Regulatory timing

Considering dynamic efficiency, regulation biased in favor of service-based competition is likely to preempt efficient investments and sustainable competitive market structures. Concerning access to elements of *Next Generation Access Networks* (mainly pure fiber or fiber-copper/coax-hybrid networks as successors of the legacy twisted-pair copper cables), the regulatory authorities are more reluctant to impose regulation in order to keep investment incentives high. Additionally it is taken into account that the investments necessary are substantial and to a large part sunk in their nature, but nevertheless relevant due to investors' capital remuneration expectations.

One example for such regulatory scrutiny has been the amendment to the German telecommunications law (Telekommunikationsgesetz, TKG) which included explicitly dynamic aspects, favoring a hands-off policy for "new markets" (which has been also the title of the §9 of the TKG after its revision of 2007). The newly added § 9a(1) stated, that new markets principally should stay unregulated. § 9a(2) still allowed for regulation of new markets, but only if two conditions are fulfilled: *i*) there are facts that justify the assumption that without regulation the tendency towards sustainable effective competition is impeded in the long run, and *ii*) particularly the aspects of efficient investments in infrastructures and the promotion of innovations have been considered. However, after a dispute with the European Commission, these regulations were declared incompatible with the European market rules at the end of 2009 and removed from the law as of April 2011. Although its effectiveness would have been critically dependent on the definition of new markets (which is a rather deliberate and complex task itself), the approach stimulated a dynamic view on regulation, allowing for less stringent

¹¹E.g., by seeking to extract rents or at least raising their costs, exaggerating input costs, or degrading the quality of the supplied input, burdensome purchasing requirements or delaying access.

interventions and even regulatory holidays, if this would have served dynamic efficiency.

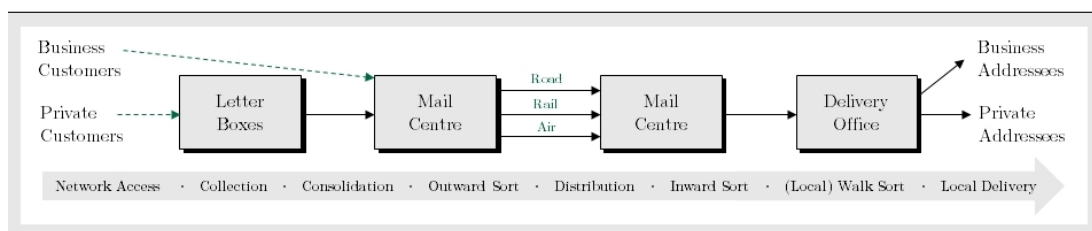
In the latest revision of the TKG (of May 2012), the regulatory certainty has again been strengthened by a combination of the possibility to define regional markets and the right of potential investors to obtain in-advance information about the regulatory conditions for a certain area. Together with the requirement that the regulator should commit for longer periods (two instead of three years), thus the timing has been improved again. However, how the law translates into regulatory reality in the future and how the European Commission influences its practical implementation is yet to be seen.

1.2.2 Application to postal markets

Network infrastructures are not necessarily permanently connected networks. They might also consist of a set of network nodes that are connected only dynamically, like it is in the postal industry which mainly consists of road and transport/delivery capacity.

Concerning this aspect, postal distribution is completely different from physical networks like telecommunications, electricity, rail, water and so on. Postal services are provided by a sequence of activities connecting senders with receivers. The activities are collection, outward sorting, transportation, inward sorting, and delivery of postal items (cf. figure 1.2).

Figure 1.2: Postal networks and related services



Source: modified from EU (2006)

The first concept for the European postal market was sketched in the European Commission’s Green Paper (EU 1992), where it was concluded, that sector-specific regulation would be required. Today, the European framework for postal regulation consists mainly of three directives (EU 1997, EU 2002b, EU 2008), with Directive COM 2008/6 EC being the most recent one. This directive aims

to complete the gradual opening of the postal markets to competition by 2009, or for some countries after another transitional period by the end of 2012.

Elements of the regulatory framework like in the telecommunications industry are: the promotion of competition, the development of the internal market and safeguarding or to ensure citizen interests. The EU *Postal Framework* does not impose access, but if it is mandated by the regulator, the usual transparency and non-discrimination rules apply, and prices have to be “geared to cost”. The framework also covers services of general interest and the financing thereof.

Economies of scale and scope

Mail collection, sorting, transport and delivery access might exhibit economies of scale and represent a natural monopoly in remote areas, but economies of scale alone do not create an essential facility. Also, the scale of indivisible sunk investments are rather low, with the possibility to lease the equipment needed, and labor cost accounting for the by far largest share of total cost.¹²

Concerning economies of scale, the assumption of a natural monopoly is not justified. For sustainable competition to be feasible, entry must be profitable, which in turn is highly interdependent with the proper design of universal service obligations to keep the minimum efficient size of entry low.

The estimated minimum efficient sizes of entry (the critical market share) is country- and operations-specific, ranging from 3 % market share with two day per week delivery (NL) to 30 % with 1 day per week delivery (UK). Actual data seems to confirm these estimates, in the Netherlands, two operators with a market share of 2.5 % each, and in Sweden one operator with 7.5 % overall share and 25 % share of the market segment of presorted bulk mail for urban delivery are all profitable. The same is true for some regional postal operators in Germany. Sunk costs seem to occur only from full-scale or otherwise high-level entry as the high number of small licensees in Germany illustrates (De Bijl, van Damme and Larouche 2005).

In addition, the economies of scope are rather limited due to different transportation means (road, rail, air) depending on different qualities, and also with respect to geographic differentiation. Even companies with mail, parcels, express, and logistics operations can only share a fraction of their networks to obtain scale advantages. Therefore, the argument of the existence of entry barriers caused by economies of scope can be rejected largely.

¹²For the European Universal Service Providers, 2002, labor cost accounted for a share of total cost of 63 % on average (Nera 2004, p. 67).

Non-replicable assets

While in telecommunications, the (copper) local loop (of existing networks) in most cases seems to represent a natural monopoly, this is not so clear for wireless and new technology networks, especially in combination with innovative deployment technologies, which provide lower cost per added subscriber and have different service properties, e.g., the mobility of services.

In the postal industry, non-replicable network elements and services hardly exist (if at all) and the economies of scale and scope are limited, if differentiation among service providers is allowed and not narrowed too much by regulation. The postal industry represents a production chain, of which only few segments might be candidates to have natural monopoly properties.

One of the unique attributes of the postal industry is, that the work can be done (at least partly) by the sender itself, e.g., (pre-)sorting or hand-over at distant point. If there is no monopolistic bottleneck, the postal (upstream) operator should probably find it in his own interest to provide access in order to keep at least a part of the revenues. This and the vivid competition among different postal providers, from the development of electronic communications such as e-mail, through parcels, express and logistics operators, print media distribution firms, and by their customers' own efforts to distribute mail (e.g., utility companies employing own staff to deliver mail; one example for this option provides the case of Vattenfall Europe, which permanently employed several people to deliver invoices and other mail in Berlin) lead to significant competitive pressure, effectively restricting the possibilities to execute market power.

Low entry barriers

In the postal industry, the requirements for access regulation generally are not met. There are no indivisible sunk investments, entry is easily possible at different scales, and users are free to switch their service provider, quickly and without significant switching costs (Panzar 2008, p. 15).

Low entry barriers and potential competition lead to efficient market structures and allocations (see for example parcel and express services), therefore downstream access regulation is judged to be not justified. Regulation of *work-sharing*, as downstream access is called in the postal sector is not necessary, if all potentially competitive segments are open to competition when there are no natural, strategic or legal entry barriers such as the mail box monopoly of the United States Postal Service (Panzar 2008, p. 18). Not only in the industrialized countries, but generally, “on a national, regional, and global level, private ope-

rators are playing an increasingly important role in the provision of even the most basic postal services. As just one example of this process, in the Latin America region, incumbent universal service providers have a share of the postal marketplace estimated less than 40 %, in spite of benefiting from some of the highest *de jure* protection in the world” (UPU 2004), providing evidence for the possibility for duplication (Panzar 2008, pp. 6-7).

The only elements that could be identified to be susceptible to access regulation are address and mail redirection and return databases based on information asymmetry grounds , and access to post office boxes (PO boxes) in the operators facilities, which can be compared with the termination monopoly in the telecommunications sector (Panzar 2008, p. 17). The service “full coverage delivery including PO boxes” is impossible for *any* operator, thus all operators have significant market power. Especially in this case, agreement seems to exist, that this kind of access to subscribers is necessary (Panzar 2008, p. 34). For PO boxes, the possibility for freely negotiated access exists, pointing to the antitrust approach. In any case, if competition law alone is considered to be insufficient to cope with market deficiencies, non-discrimination obligations concerning freely negotiated access should be considered first (cf. also Bergman 2002). Access regulation is justified, if a privately negotiated solution cannot be agreed upon. If regulation has to be imposed, the principles, e.g., concerning the pricing should be applied as discussed above. The view, that there are no non-replicable assets (at least in the narrow sense) was confirmed by the Court of Justice of the European Communities in the case decision Oscar Bronner vs. Mediaprint (C-7/97).

1.3 End user tariff regulation

*“As a starting point, retail regulation can only be envisaged if and once it has been concluded that wholesale regulation cannot suffice to achieve the regulatory objectives set out above the retail level.”*¹³

Basically, wholesale regulation may be insufficient, if an essential input is provided by a vertically integrated operator, which is also operating in downstream markets with imperfect competition. The underlying sources for the resulting inefficiencies are little competitive restraints from actual or potential entry, on the dynamic side strategic conduct, such as foreclosure and predation, and discrimination incentives as with regards to discrimination between other operators and between market segments as discussed above in section 1.2.1.

¹³Brunekreeft, van Damme, Larouche and Sorana (2005, p. 12).

1.3.1 Economic rationale and implementation in telecommunications

Brock (2002) provides a decent overview over the early years: Historically, in the first half of the 19th century in the U.S., for many infrastructure industries, municipal franchise contracts administered by council subcommittees or boards were used. In most cases, the franchises were not exclusive contracts, but the municipalities frequently issued duplicative franchises. Price had to satisfy the conditions to be “reasonable with reference to the costs of producing and delivering the same”, “not unreasonable or exorbitant” or “not exceeding the average rate charged by other cities”.

In telecommunications, during that time, Bell developed its long distance voice telephony system, due to protection from the basic patent from 1879 until its expiration 1893 as a full monopoly, and since then under competition of many entrants, especially in regions that had not been served by the Bell system under the American Telephone and Telegraph Corporation (AT&T) as the parent company. 1907, Bell’s president Vail started to pursue a three part strategy including mergers with independent phone companies, emphasis on basic research and patent purchases, and to embrace regulation as a way to preserve monopoly power by justifying a system without competition.

1922, the second monopoly era began, 40 of 48 states were granting the AT&T monopoly and regulating rates concerning level and structure, e.g., through geographically averaged prices, with line rental fees subsidized by usage charges, and so on. The 1934 Communications act confirmed the regulated private monopoly of AT&T and introduced federal regulation, administered by the Federal Communications Commission (FCC) which was created by the act. During the next 60 years, regulation evolved continuously, and the monopoly area was reduced significantly. On the other hand, until the 1960’s state regulators and the FCC protected AT&T’s core monopoly.

After minor steps from the “Commission price setting system”, in the 1960’s, price regulation gradually became cost-oriented, using a cost-plus approach or Rate of Return regulation, although still the individual state Public Service Commissions shared this task with the FCC. In this *Rate of Return era* until 1989, prices were set by the different regulatory bodies focusing first profit regulation and prices and underlying costs instead of profits from the 1980’s on. *Incentive regulation* in the form of price cap regulation tried to introduce additional incentives to increase cost efficiency and to allow higher pricing flexibility, with

a growing tendency in the 90's.¹⁴ Since then, the FCC reregulated retail pricing and implemented different versions of end user tariff regulation.¹⁵ Finally, the 1996 Communications act not only ended the second monopoly era of AT&T, introduced the whole set of today's requirements including unbundling, resale obligations etc., but also implemented the forward-looking cost orientation concept (TELRIC) as it is still used today (Brock 2002).

In Europe, as in the U.S., telecommunication services were provided by vertically integrated monopolists for equipment, and basic network and service provision. The difference was that these monopolies in Europe mainly were organized as public entities. The national telecommunications operators at the same time were policy-makers under direct political control instead of being a regulated firm. Performance varied across Europe.¹⁶ From the 1990's on, the markets for equipment, value-added services, mobile services, basic services, and lastly infrastructure networks were liberalized. The national operators were restructured, corporatized¹⁷ and (partly) privatized, and independent regulatory authorities were installed. Prices were set by newly established regulatory agencies. The evolution of price regulation towards incentive-controls in the form of price caps in the EU mostly preceded the privatization process.

Additional pricing requirements

Telecommunication and postal legislations include elements on universal service, and related pricing. Examples for such price controls include uniformity obligations and the definition of "affordability", as well as the requirement to offer

¹⁴Price-cap regulation as proposed by Littlechild (1983) subsequently was adopted first by the British government and instituted for the first time in the U.S. 1989 by the Federal Communications Commission (FCC) for AT&T long-distance service (Acton and Vogelsang 1989). Afterwards, this regulatory tool quickly spread to other countries and industries.

¹⁵Federal Communications Act (1994), treatment of mobile services. Second report and order, 9 F.C.C.R. 1411, Sections 3 and 332, para 12, 14-16; and Federal Communications Act (1996) 47 U.S.C. §§ 251-252.

¹⁶For example, in France the *Minitel*, or ISDN in Germany were considered to have been considerably successful, whereas the *Bildschirmtext* system in Germany never reached significant market penetration.

¹⁷Shirley (1999, p.115) defines corporatization "as efforts to make SOEs [State-Owned Enterprises; author's note] operate as if they were private firms [...]. The definition includes not only incorporating SOEs under the same commercial laws as private firms, but other steps to put state firms on a level playing field with private firms by removing barriers to entry, subsidies and special privileges, forcing SOEs to compete for finance on an equal basis with private firms, and giving state managers virtually the same powers and incentives as private managers". Corporatization aims to achieve similar efficiency of SOEs as of private companies although the government remains the sole shareholder of the firm. It is based on the presumption that firms which operate under a public administration setting tend to be less efficient than their private counterparts.

special tariffs for low-income users. Thereby, the current framework in the EU exhibits some contradictions. For example, the Swedish regulatory agency claims, that the European framework imposes incompatible demands for legislation on the member states: uniform tariffs and prices geared to cost at the same time would be infeasible under most conditions (PTS 2000).

In practice, a mixture of price caps and RoR regulation (based on cost models) can be observed. In addition, discretionary ex ante approvals by the regulatory bodies and structural requirements (uniform prices) apply and ex post supervision of prices concerning price cost margins and price cost squeezes is in place (cf. table 1.2 below). Due to the complex dependencies within these regulatory systems, regular adjustments to changing competitive environments are necessary, e.g., concerning the baskets, prices, or market definitions.

At the moment, the regulatory framework is under development to meet the challenges from buzzword processes like the deployment of next generation networks or media convergence and the related increase in the use of bundling in the telecommunications industry. UK still is at the “deregulatory forefront”: After the vertical divestiture of BT into OpenReach (upstream) and BT (downstream/retail division), Ofcom removed on July 31st 2006 after 22 years all retail price controls (Ofcom 2006).

Table 1.2: Examples of downstream access in telecommunications

Country	Telecommunications service regulation (2007)
Canada	Price cap or prior approval with SMP
Germany	Price cap for SMP market segments, three baskets ¹
Netherlands	Price cap for SMP operators (voice and leased lines)
Sweden	Cost plus and price cap combined ²
United Kingdom	Only ex post control
United States	Price cap on SMP operator

¹ Voice, fixed, mobile.

² Cost plus for fixed network access and capacity, price cap for leased lines.

Source: OECD (2007), ITU Regulatory Database.

Practical drawbacks and caveats

Comparing the functions and incentives of price cap and RoR regulation, it quickly gets clear, that the two approaches have few in common, despite the

aim to prevent the exercise of market power and to correct the associated socially inefficient prices.

Scientific studies tried to examine the effects of incentive regulation: “In summary, the studies to date provide varied evidence regarding the impact of incentive regulation on performance in the U.S. telecommunications industry. Incentive regulation appears to increase the deployment of modern switching and transmission equipment, to spur an increase in total factor productivity growth, and to foster a modest reduction in certain service prices. There is little evidence, though, that incentive regulation leads to a significant reduction in operating costs. There is also little evidence of a systematic decline in service quality under incentive regulation.” (Sappington 2002, p. 78).

Design and implementation of regulation often could take a wider perspective on long-run efficiency and include product innovation, process innovation and intermodal competition appropriately. If quality is of concern, introducing adequate incentives for service quality as suitable modifications of price cap plans can be implemented in addition to potentially existing standard price cap regulation in a variety of ways (Sappington 2002, p. 25).

In competition suits, the definition of predation is of highest importance to distinguish between competitive and anti-competitive behavior. The four criteria to be assessed are, *i*) whether the retail prices are below a certain level, *ii*) whether with intention to drive competitors out of the market, *iii*) whether with the aim to raise future prices, and *iv*) whether there exists an acceptable efficiency defense (Brodley, Bolton and Riordan 2000, p. 2241). Often, the first criterion is used for a first assessment; thereby “hard-to-match prices” can easily qualify as anti-competitive at a first glance. Thereby, neither RoR regulation nor price caps are designed to deal with anticompetitive effects or to include other goals such as “affordable uniform prices” or social tariffs.

Predation, preemption and foreclosure incentives remain

*“Although pricing flexibility can enable an incumbent supplier to respond to competitive pressures and thereby prevent operation by a higher-cost rival, the flexibility can also serve to undo cross-subsidies that regulators have implemented to promote equity, fairness, and/or other political objectives.”*¹⁸

To deter abusive practices on final consumers and competitors, still competition policy and strict enforcement is needed. Over time, predatory pricing, leveraging,

¹⁸Sappington (2002, p. 24).

foreclosure, tying, pure bundling, refusals to deal, undue cross-subsidization, and raising rivals' costs strategies were engaged to monopolize markets, with the intention to preempt entry or drive competitors out of the market (cf. Spulber (2002) for an overview). The pricing flexibility might be used implicitly for cross-subsidization, either horizontally (downstream) or vertically to downstream. The result might be a "margin squeeze", which denotes a reduction of the margin between wholesale and retail charges by a vertically integrated dominant operator so as to make entry difficult or to encourage exit (Geradin and O'Donoghue 2005, p. 356). This margin squeeze imposes additional efficiency constraints on the competitors which the incumbent's retail branch does not have to fulfill.¹⁹

The formalization of such cases might happen either as margin squeeze or predatory pricing cases. Generally, while wholesale caps usually are based on production costs in competition policy cases, the retail floor levels might reflect production costs, economic value or benchmark prices (Haag and Klotz 1998).

Case law is mainly shaping also national competition policy in this area. Generally, fines depend on gravity and duration plus (or minus) aggravating (or attenuating) circumstances.²⁰ Within the EU, national competition law proceedings were launched in numerous countries, e.g., in Denmark, France, Italy, the Netherlands, and UK. The cases *Deutsche Telekom*, *Wanadoo*, and *Telefónica* were the most important precedents for price abuses (respective margin squeeze and predatory pricing) under art. 82 EC treaty. In Australia, pricing behavior with retail prices even below wholesale prices was observable (EU 2003a, 2003b).²¹

Additionally pure bundling and exclusion are of concern, which both reflect the possibility to leverage market power from an SMP-product to a non-SMP product, as, e.g., the bundling of access and services in telecommunications, which can be dealt with securely through competition policy only, if the consequences are not irreversible and sufficiently severe (Brunekreeft et al. 2005, p. 63).

1.3.2 Application to postal markets

Concerning end user tariff regulation, conceptually the same problems as in telecommunications are likely to arise. As in telecommunications, price regulation in practice is implemented as a mixture of different approaches for different segments of the postal market (cf. table 1.3).

¹⁹European Commission, in DT case, OJ 2003 L 263/9, para 140.

²⁰According to: Guidelines on the method of setting fines imposed pursuant to Article 15 (2) of Regulation No 17, OJ C9, 14.1.1998, point A.

²¹For an overview over national cases in the telecommunications sector see Geradin and O'Donoghue (2005, p. 355).

Table 1.3: Examples of downstream access in postal industries

Country	Postal service regulation (2007, Germany: 2008)
Canada	Price cap or single price approval, basic letter rate rate and single piece mail, notification in advance, multi-year pricing plan approval
Germany	Price cap for SMP operators with ex ante approvals of single prices, bulk mail above 50 items/ mailing excluded, efficient-cost-concept
Netherlands	Price cap with two baskets (all products and small users), uniformity obligations
Sweden	Cost orientation and uniformity required, only domestic letter rate regulated, otherwise free to set prices if compliant with competition rules
United States	Price caps and floors, increases limited by CPI, notification in advance, ban on below-cost pricing

Source: IPC Regulatory Database.

The effectiveness of price regulation might be limited by universal service obligations, especially in combination with hybrid or partial competition. Universal service obligations in effect may restrict differentiation possibilities and require consistent market definitions which make highly differentiated products or networks problematic to be handled by the regulatory framework. Protecting end users, intermodal competition by e-mail, fax, telephone, short messages etc. is yet a strong disciplining market force which limits excessive pricing.

Additionally, postal service pricing is somehow simpler than telecommunications pricing, because for private customers in most cases only linear tariffs apply, which in turn leads to increased market transparency. Finally, provider switching costs are very low because there are no subscriber contracts, attributes which both are likely to further restrict prices.

Facing the fact, that the by far largest share of letter post items (EU wide) is sent by businesses and organizations rather than individuals; the business to consumer (B2C) segment of the letter post now accounts for 62 % of total volume (EU 2006b, p. 56). This market concentration on the sender side might also limit prices because of their option to scale to replicate the postal network.

With the ongoing liberalization process, tariff regulation usually only was introduced for universal services and the legal monopoly of the reserved area and

the potential to withdraw stringent tariff regulation raises. Accordingly, in the Netherlands, the regulatory focus shifted from the whole postal market to small users and led to the introduction of a further price cap basket to reduce the regulated market segment. In Germany, regulation applies partly only up to 50 items per sending and in Sweden only the domestic (single) letter rate is directly retail price regulated.

Safeguarding competition is likely to be achieved by ex post control based on competition policy. For margin squeezes as in telecommunications, the dominant operator must be *i)* vertically integrated, *ii)* the input must be essential, and *iii)* the input must constitute a relatively high proportion of the downstream/total cost. For such a margin squeeze being judged anti-competitive, it depends furthermore on *iv)* the imputation results and the definitions of “reasonably efficient service provider” and “normal profit”, on the possibility of *v)* an efficiency defense providing a reason other than strategic anti-competitive behavior, e.g., achieving critical masses through introductory offers, and *vi)* harmful effects on consumers and substantial negative effect on competition have to be proven. Due to the low entry barriers to postal markets, also predatory pricing becomes unlikely, because the short-run losses from such strategies are unlikely to be compensated in the future. Therefore, ex post price control based on competition policy should be sufficient (Panzar 2008, p. 19).

1.4 Conclusion

Assessing the regulation of telecommunications markets from the postal sector perspective, the main conclusion is that regulation of postal markets should not follow the regulatory policies used for telecommunications markets, which also confirms the findings of Baake and Wey (2007a). Even if the idea of just regulating bottlenecks seems appealing and to lead to rather straightforward regulatory regimes, more complex regimes with high information requirements are needed to achieve efficient outcomes.

Postal service markets have much more in common with standard markets such as retailing, where sector-specific regulations are absent. Underestimating the differences between postal service markets and telecommunications markets concerning contestability or the technological features of the underlying network may very well lead to distortions and suboptimal market performance when the toll set used in telecommunications markets is imprudently applied to postal services.

The markets are highly contestable due to the differences in the network characteristics which allow for competition. The experience from access and price regulation of telecommunications industries is problematic: Access regulation and wholesale obligations distort investment decisions and spur service based competition. In the longer run, this might lead to inefficiencies from the lack of investment into innovations and concerning intermodal competition.

Especially in the most open markets, dynamic reform processes have resulted not only in greater efficiency of postal operators but also in a market which focuses more and more on the interests of the customers. Reorganization, consolidation and diversification are continuing, and low cost business models are developing. Overall, service quality and performance increased. From a consumer perspective, all this has increased the ability of Europe's postal operators to meet customer needs and thus has a positive effect on universal service. Analyses of market shares of competitors as well as the subjective perception of key players confirm that in cases where the monopoly has been completely abolished or substantially reduced, real competition is emerging (EU 2006b, p. 57).

Generally, in the postal industry there are neither non-transitory entry barriers of structural or (with the abolishment of the reserved area) legal nature, nor does the market do not tend towards effective competition over time. In addition, most problems can be addressed sufficiently by competition law alone. Hence, there is only limited scope for regulation, and regulation should focus on competitive bottlenecks with proportionate remedies applied in a punctual fashion. If structural bottlenecks are symmetric, regulation should prefer market-based negotiation outcomes to symmetric rules, which allow for end-to-end competition on a level playing field.

Chapter 2

The Impact of Regulation on Postal Markets

“Although there has been much theoretical and empirical research on the effects on privatization and competition in infrastructure in general, relatively little work has been done on how the degree of privatization and competition affects performance and how components of the policies interact in shaping the reform outcomes.”¹

Especially in physical infrastructure industries like, e.g., telecommunications, electricity, railways, and also in the postal industry, regulatory policies have a major impact on the outcome of the market. This includes quantities, prices, and productivity, but also the industry structure and the conduct of the players on the markets.

While the literature on policy analysis and evaluation mainly focused infrastructure-tied industries in the past, with the ongoing regulatory reform and the high importance of the postal markets – not alone in terms of the product market size, but also in employment terms – the postal industry is becoming focused increasingly. Against the background of the ongoing process of liberalization especially throughout Europe, and the contemporarily difficult overall economic conditions which even seem to accelerate the trend of declining mail volumes, the importance to regulate markets in an optimal way in order to minimize potentially negative effects of regulation has become increasingly important.

Therefore, we consider the effect of different economic, social, and demographic factors for the countries Finland, France, Germany, the Netherlands, Spain, Switzerland, the United Kingdom as well as the United States. The variables contain factors that already have been identified to be significant drivers

¹Li and Xu (2004, p. 1).

of mail volumes including population data and telecommunications penetration data (as a proxy for possible e-substitution). In addition, we introduce new variables with regard to the relationship of the postal operators with the respective governments (such as the independence of the operators and the share held by government) and with regard to regulation (such as the access regulation or the market regulatory index) to analyze their impact on the market development because a better understanding of their impact would help to improve postal policies.

We estimate different fixed effects (FE) least squares and FE logit models to assess those relationships. We would expect, that high overall product market regulation affect market volumes negatively because of the related regulatory restrictions to their strategy and tactics which constrain operators to act fully market-driven.

Corporatization and independence (or reduced government shares) of the incumbent operator are expected to affect both, volumes and turnover positively because of an optimization of the product offerings and pricing² while decreasing employment due to an increased incentive to optimize cost. This expectation that independence and corporatization lead to a decreasing workforce stems from an expectedly increased industrialization of the postal industry (automation) on the one hand and the optimization of the workforces including measures such as real-time route optimization and flexibilization of working hours (which both increase labour efficiency and thus allow the reduction of staff in terms of full time equivalents).

2.1 Literature review

The work is motivated by the existing literature on postal demand estimation, articles on electronic substitution and – more in general – the drivers of different mailstreams, as well as on regulatory impact analysis.

So far, the main drivers of mail demand have been mainly the gross domestic product (GDP), prices, and other variables reflecting economic activity, for example income. But since quite a while, the explanatory power of these models

²Aivazian, Ge and Qiu (2005, in particular p. 807) empirically confirm the view that “corporatization has had a significantly positive impact on SOE [State-Owned Enterprises; author’s note] performance. Our results suggest that, even without full privatization, corporate governance reform of SOEs can effectively improve performance. They suggest an alternative policy prescription for countries looking for a way of restructuring their SOEs without massive privatization”.

appears to be decreasing and the portion of unobserved heterogeneity increased over time.³ E.g., Diakova (2005) shows, that total mail volumes so far have been explained to a large extent by real GDP (with up to 90 % of the variance observed explained solely by this factor), but since 1998, the correlation has been falling behind (in particular for the US). This is especially observable if different types of mail purposes are considered separately.

Harding (2004) provides an extensive overview over the models which have been used up today and proposes to include the distribution of the incomes to be included in order to correct for some deviances from the previous situation where GDP alone used to statistically explain more than 85 % of the postal volumes. He still finds, that GDP is able to explain a large share of the observed variance, but also proxies for economic activity such as households having a bank account, having a phone and so on contributes a lot of explanation to the data observed.⁴

Nader and Lintell (2008, based on Nader 2004) point to some further aspects that should be included in the analysis, for example the possibility that the volume gains by competitors might offset the decline in mail volumes delivered by the incumbent National Postal Operators (NPOs), that quality improvements lead to the shift of mail from priority to economy categories as well as quality improvement in targeting customers with direct mail might lead to a shift to mail categories of higher quality or even to small promotional parcels at the expense of the amount of direct letter mail sent.

Common to all authors is the proposal to disaggregate the mailstream and to add additional explanatory variables.

Substitution not between different mail types but to electronic alternatives is another central issue for the postal industry, since the choice of mailers and the receiver preferences are also not fully understood yet (cf., e.g., Nader and Jimenez 2005 and Szeto and Jimenez 2005). One example for an extensive econometric model of the US market based on the Household Diary Survey predicts further decline of mail demand with rising personal computer penetration, growing stamp prices, and declining telephone service prices (Hong and Wolak 2008), whereas other authors additionally predict an increased pace of the decline in the current economic downturn, albeit the impact on the various mail categories differs substantially between short and long run, different mail attributes and contents,

³Cf. also Diversified Specifics (2002) for the disaggregated view on different mailstreams.

⁴E.g., Jimenez, Harding and Lintell (2007) propose the inclusion of income dispersion (inequality) measures in order to improve model fits to some remarkable extent.

and depending on the different needs of senders and receivers.⁵ Surprisingly, at least in the volumes from 1999 until 2009, the OECD does not include letter mail in their *Communications Outlook* (OECD 1999, 2001, 2003, 2005, 2007 and 2009), but concentrates on electronic communication and broadcasting. On the other hand, they issued once a report on the *Impact on Substitute Services on Regulation* (OECD 2006).

The articles on regulatory analysis in the postal sector start from verbal discussions of postal reforms like the seminal article of Coase (1939), to theory-based qualitative assessments concerning the optimal regulation of the postal market (cf. in particular Baake and Wey 2007a, De Bijl, Van Damme and Larouche 2005, Heitzler 2009). Additionally of high importance is to embed the postal service markets and the governing regulation into the communications market as a whole, an idea which is elaborated more in detail in chapter 5 with regard to the future of the universal service.

Closely related to the regulation of competition in these markets especially is the impact of the universal service obligations on consumers and on competition. Overall, the right assessment of these services of public interest and the right policy implications might substantially improve the preconditions for competition to evolve, if no operator is restricted overly and the mandated services are adapted to the preferences and need of the consumers (cf., e.g., Finger 2006). The result of efficient regulatory policies might not only be optimal conditions for the consumers and customers, but also efficient competition patterns to evolve (De Bas and van der Lijn 2008). Game-theoretic models of the industry thereby provide additional valuable insights into the postal industry (cf., e.g., Crew and Kleindorfer 1998, Dietl, Felisberto et al. 2006 or Mizutani and Uranishi 2003).

The articles on regulatory reform in a broader context comparing international product and labor market reforms either are not industry-dependent, for example if they employ a macroeconomic *General Equilibrium* model (see Blanchard and Giavazzi 2003 for an example) or if they empirically analyze macro effects and the interdependence of labor and product market institutions and/or reforms and the related outcomes (e.g., Koedijk, Kremers et al. 1996, Loayza, Oviedo and Servén 2004), or these articles are mainly dealing with other sectors than the postal industry. Prominent examples are the texts dealing with the regulation, market structure and performance of telecommunications and other physical network industries (e.g., Boylaud and Nicoletti 2000, Grajek and Röller 2009, Li and Xu

⁵Although mainly the sender chooses the communication channel (because she is the party that pays), it has to fulfil the needs of both, the senders and the recipients (Koppe and Hömstreit 2009).

2004, Nicoletti, Scarpetta and Lane 2003, Röller and Waverman 2001, Wallsten 2001, Waverman, Meschi et al. 2007).

For example, Grajek and Röller (2009) analyze the trade-off between access and investment incentives using a dataset covering over 70 fixed line operators in 20 countries over 10 years. Their data sources include the Amadeus firm level database for capital stock levels and investments and the Plaut Economics telecoms regulatory index amongst others. Not surprisingly, these studies provide very robust results. They find that a regulatory commitment problem which leads to the fact that access regulation negatively impacted overall and individual carrier investments (including individual entrants) and regulatory endogeneity which leads to the problem, that the higher the incumbents' investments, the higher the probability that mandated access had to be provided, additionally undermining the investment incentives.

Koedijk, Kremers et al. (2006) find a clearly negative relationship between regulation and economic performance, both of labor and product market regulation. They state the view, that it is key to avoid unnecessary restrictive regulations, although not all regulation has a negative impact on the overall development of the market, for example regulations which increase market transparency or facilitate market entry might be well in place.

Waverman, Meschi et al. (2007) examined also the telecommunications sector and the impact of access regulation (local loop unbundling, LLU) on investment in infrastructures including alternative access platforms in order to capture the most important aspect of telecommunications regulation and competition, namely sustainable inter-modal competition between different platforms. Their main result is, that low local loop access prices cause a strong substitution from broadband over alternative platforms towards access-based competition, which leads to massive distortions concerning the market evolution and innovation.

Similarly, with *End-to-End competition* instead of *Worksharing* (which is synonymous to downstream access) in the postal industry, greater diversity of access platforms is to be expected to provide greater opportunities for innovation and product differentiation (Waverman and Meschi 2007, p. 2). Factoring in the impact of access regulation (and even worse in combination with regulated low access and retail prices) leads to the effect of overall decreased service. Their findings included, that low LLU prices prevented the roll-out of competing access networks as well as the upgrading or increasing the footprint of existing networks, thus limiting last mile innovations.

Common to these articles are sophisticated econometric models and the use of data compiled from different sources in order to obtain a dataset which allows for very detailed analysis of the question in doubt. For this chapter, the data availability for the postal industry was explored with the goal to conduct a similar analysis for the postal industry to bridge the gap between the methods employed in the articles mentioned and to obtain insights for recommendations of postal policies based on econometric analysis.

The results of this chapter confirm the findings of the literature with regard to the directions of the effects of the variables analyzed, but also underline the need for better and faster available data with regard to the postal markets.

2.2 The data

In order to estimate a model of similar value, data of similar extent and quality is necessary. Therefore we tried to collect the data relevant for postal policy and to understand the effect of regulation on the interdependencies between the postal and the neighboring telecommunications sector from existing sources (cf. table 2.1: Data and data sources).⁶ The telecommunications sector variables representing the share of internet users and of mobile telecommunications subscribers among the populations in the considered countries have been included because of the potential effect of substitution of letters by electronic communication.

Starting point was a set of eight countries, namely Finland, France, Germany, the Netherlands, Spain, Switzerland, the United Kingdom and the United States. These industrialized countries were expected to have relatively large amount of data available and to be heterogeneous enough to allow for estimations.

The timeframe was set to include the year 1992 to 2006. 1992 was chosen as the starting year of the European postal reforms with the publication of the *Green Paper* by the European Commission (EU 1992), intentionally including Switzerland and the US as countries not covered by the European reform agenda.

Most of the data is freely available. This includes all data on the country characteristics, such as size, population, degree of urbanization and macroeconomic factors such as gross domestic product, national income, or price indices.

⁶The full dataset is included as an attachment to the Adobe Acrobat version of this thesis.

Table 2.1: Data and data sources

Market and operator data (on postal services and Telecommunications)	International Post Corporation
	Universal Postal Union
	International Telecommunications Union
	OECD
	Eurostat
	National statistics offices
	Annual reports and webpages of operators and NRAs Publicly available consulting reports
Regulatory data and indices (on Postal services and Telecommunications)	Fraser Institute's <i>Economic Freedom Indicator</i> (see Gwartney, Robert et. al. 2009)
	OECD Product market indicator
	The World Bank <i>Doing Business Index</i>
National economy, geographic, and demographic data	OECD
	Eurostat
	The World Bank
	CIA World Factbook
	Governmental webpages

The data on the postal sector was very difficult to find for the years, in particular after 2006 and before 1994. Therefore, for the estimations the dataset had been restricted to the years 1994 to 2006. Especially surprising was the fact, that Eurostat had dropped gathering data on the postal sector, although the liberalization agenda had been initiated by the European commission. Eurostat started the collection of data on postal markets not before 2005 again. Regrettably, all data sets are characterized by missing values and high aggregation levels, which has been an especially difficult issue to deal with due to the high level of merger, divestiture and diversification activities. Consequently, the data has to be examined very carefully. The market and operational data was especially difficult to deal with due to the operators' reluctance concerning their publication and the high levels of aggregation.

The variables of the uniquely constructed dataset are described in the following table 2.2: Variables and data description. The according summary statistics are given in the subsequent table 2.3: Summary statistics.

Table 2.2: Variables and data set description

Country	Country name
cc	Country code (short descriptor)
cid	Country ID (1 to 8)
year	Year
d_pop_gro	Growth rate of population
d_population	Population (number of inhabitants)
m_gdp_gro	Gross Domestic Product Growth Rate
npo_corp	Corporatization of National Postal Operator
npo_fte_gro	National Postal Operators' staff growth rate
npo_fte_ls	Number of national postal operators' employees (FTE, letter segment)
npo_govshare	Share of National Postal Operator held by government
npo_indep	Independence of National Postal Operator
npo_letrev_gro	National Postal Operators' letter mail revenues growth rate
npo_lpi_gro	National postal operators' Letter Post Items Growth Rate
npo_lpi_gro_bin	National postal operators' Letter Post Items Growth (binary variable indicating positive growth value)
reg_access	Access to the postal network is mandated by regulation
reg_fraser_5	Fraser Institute's Economic Freedom of the World (subindex 5 <i>Regulation of Credit, Labor, and Business</i> , see Gwartney, Robert et. al. 2009, p. 198)
reg_oecd	OECD product market regulatory index
tk_inetusr	Internet users per 100 inhabitants

Table 2.3: Summary statistics

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
cid	120	4.5	2.300895	1	8
year	120	1999	4.338609	1992	2006
d_pop_gro	112	0.5528202	0.3902987	-0.1127073	1.671469
d_population	120	6.84E+07	8.39E+07	5035000	2.98E+08
m_gdp_gro	112	2.530666	1.462679	-1.031505	6.091118
npo_corp	120	0.4666667	0.5009794	0	1
npo_fte_gro	98	-0.6063324	3.332847	-9.435067	9.187724
npo_fte_ls	106	179281.5	247807.7	15076	851780.5
npo_govshare	120	92.31667	20.98355	0	100
npo_indep	120	0.7833333	0.4137009	0	1
npo_letrev_gro	96	2.411153	3.384417	-3.989182	16.00538
npo_lpi_gro	97	0.8751374	2.795438	-5.262009	8.100731
npo_lpi_gro_bin	97	0.5257732	0.5019293	0	1
reg_access	120	0.2041667	0.4021781	0	1
reg_fraser_5	120	6.95825	0.8021648	5.37	8.29
reg_oecd	120	3.29838	0.8254949	1.698	4.4385
tk_inetusers	120	29.05833	25.84612	0	81

2.3 The models

As the impact of the regulatory framework for postal services might vary by the type of regulation, we assessed the impact of regulation on the letter mail volumes and revenues. The expected effects which also served as the working hypotheses were, that low regulatory requirements and low internet usage would correlate with high physical mail volumes and revenues, with population sizes and GDP (and the growth thereof) determining the base level for a given country (number of addressable users and their wealth).

The control variables included in the specifications also cover overall GDP development (as this factor was one of the main driver of postal volumes and revenues in the past, see the literature review above) as well as measures covering the legal situation of the national postal operator and the internet usage in the countries considered.

The model we chose for the estimation was mainly (for no. 1, 2, 5, 6, 7) a fixed effects panel model in the usual form $y_{it} = x'_{it}\beta + z'_i\alpha + \varepsilon_{it}$ (see, e.g., Greene

2003, p. 285). Fixed effects have been chosen due to the clear advantage that they allow to correct for a (presumable) omitted variable bias, as they capture all individual time invariant information on the fixed effect, which implies that only information that is varying over time is used to determine the coefficients. Although this implies imposing a restriction to the used sample and to accept some side-effects, we discarded the pooled ordinary least squares (OLS) model, random effects panel models and instrumental variable approaches.

The pooled OLS model has been discarded because it has to fulfill the same strict assumptions of a cross-sectional OLS model, namely the assumption that there are neither unobserved heterogeneity nor serial correlation and because it is neither consistent nor efficient with individual heterogeneity (cf. Greene 2003, sect. 2.3). In addition, random effects (RE) models impose additional requirements such as the strict exogeneity of the independent variables and independence (orthogonality) of the errors (Wooldridge 2002, p. 257). Although Hausman tests failed to reject the RE, testing for serial correlation produced results which have been close to be significant. Greene (2003, p. 301) confirms the view, that, in doubt, FE models should be used: “There is little justification for treating the individual effects as uncorrelated with the other regressors, as is assumed in the random effects model.”

Thus, we chose fixed effects (FE) for our estimations (individually). Those models provide the advantage of allowing unobserved heterogeneity which is partially correlated with the explanatory variables (cf. Wooldridge 2002, p. 257), even if “the random effects treatment does allow the model to contain observed time invariant characteristics, such as demographic characteristics, while the fixed effects model does not” (Greene 2003, p. 303), as our variables are not complete invariant. However, with especially the regulatory variables being only slowly changing, one could expect that some of their effect is considered as being a country-specific fixed effect and thus their impact being underestimated. Instrumental variable (IV) estimation has been discarded because of the relatively weak small-sample properties of this approach. In small samples, the IV estimator can have a substantial bias (Wooldridge 2009, ch. 15) and the precision of IV estimates is lower than that of OLS estimates (least squares). In the presence of weak instruments (we did not find good instruments for the postal industry), the loss of precision will be severe, and IV estimates may be no improvement over OLS (Baum 2007). In order to counter potential heteroskedasticity problems, we employ robust standard errors for our estimations, as the alternative of a cluster-

robust estimator may be very incorrect with a small number of clusters (8, in our sample) and maybe substantially biased downwards (Wooldridge 2003).

For the remaining estimations (3 and 4) we employed a fixed effect logit model which served mainly for checking the first two ones, again with robust errors.

2.4 Results

Most notably, corporatization⁷ has consistently (in 1, 2, 5, 6) a significant impact on the number of letter items as well as on the related revenues, whereas the independence of a postal operator has only a significant impact on the number of items. Thus we clearly confirm the results Aivazian, Ge and Qui (2005). Furthermore, as expected, an increasing number of internet users corresponds to a lower number of items. However, the assessments of the impact of the two regulatory variables, namely the OECD product market regulations indicator and the the *Economic Freedom of the World* indicator (sub-indicator 5) by the Fraser Institute (Gwartney, Robert et. al. 2009) on the growth of the corresponding dependent variables are of little significance.

In addition, albeit the sign of the indicator of the Fraser Institute points to the right direction, the signs of the OECD indicator are surprising, as according to them higher regulation increases the number of letter post items - which could be the case, if for example worksharing mail volumes increase with the intensification of competition (cf. especially estimation 3).

Negative impact could be expected from the share of users with access to the internet (presumably proxying e-substitution), which they provide significantly on volumes but not on revenues. One explanation could be that internet users have already sent and received a low number of letters even before joining the online community. Furthermore, on the revenue side, all variables except corporatization are insignificant. It remains unclear whether this is due to the fact that there is actually no effect or whether the high level of data aggregation masks the effects through revenues from diversification of the national postal operators.

As previously described in the literature section, the influence of the development of the gross domestic product has vanished. Although it is visible in the Logit estimations (with their reduction to a binary dependent variable), it is only significant in (2), but not with the above-90 % impact levels which have been reported in the literature section of this chapter. Similarly, the growth of the population of the countries does not show significant effect, which could be due

⁷For an explanation of “corporatization”, see above (Chapter 1, footnote 17).

Table 2.4: Estimation outputs

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Estimation	npo_lpi-gro Lim. FE (r)	npo_lpi-gro Lim. FE (r)	npo_lpi-gro_bim Logit FE	npo_lpi-gro_bim Logit FE	npo_letrev-gro Lim. FE (r)	npo_letrev-gro Lim. FE (r)	npo_fte-gro Lim. FE (r)
m_gdp-gro	0.516 (2.23)	0.612* (3.31)	0.648** (2.81)	0.975*** (3.62)	0.319 (1.01)	0.428 (1.53)	0.000 (0.00)
reg_oecd	0.248 (0.56)		1.004* (2.05)		-0.729 (-1.27)		
reg_fraser_5		-0.883 (-0.98)		-2.040 (-2.39)		-1.049 (-1.76)	
tk_inetusers	-0.053* (-2.99)	-0.055** (-5.33)			-0.241 (-0.97)	-0.007 (-0.33)	-0.279 (-1.37)
npo_indep	2.906** (4.63)	2.895** (4.99)			2.173 (1.70)	2.078 (1.51)	
npo_corp	2.141* (2.86)	1.875* (3.30)			2.921* (3.33)	2.311* (2.79)	-1.595 (-1.04)
npo_govshare							-0.109 (-0.55)
d_pop-gro	0.299 (0.51)	0.610 (0.79)			1.408 (1.64)	1.713 (1.75)	2.239* (3.25)
_cons	-3.054 (-1.82)	3.630 (0.58)	-0.528** (-4.13)	3.085 (2.20)	0.662 (0.38)	5.005 (1.22)	0.966 (0.32)
N	97	97	97	97	96	96	98

t-/*z*-statistics in parentheses
 p*!0.05 *p*!0.01 ****p*!0.001

to the fact, that there is not much movement in the variable, or that the number of letter mail items has been decoupled from the GDP development.

In times of electronic delivery of messages, also the FTE growth of the incumbent operators has no significant effect on the number of employees at the national postal operator. Unfortunately, there is not sufficient data available to see, whether emerging competition and the related employment capture this effect.

2.5 Conclusion

Although the direct estimation results here provide limited statistical evidence for the influence of explanatory variables concerning regulations, the issue should be re-examined with a comparable model as soon as a suitable dataset is available. The outcomes are well in line with theoretical articles concerning the postal industry as well as many empirical papers, including works examining other industries. The data leaves room for further variables influencing the overall postal market development, however, it does suggest that the policy influences on volumes, prices, markets, employment, and agents' behavior also from the variables taken into consideration should be taken into account when economically sound policies are to be designed.

Because of the data limitations, statistical significance is hard to achieve. Due to the lack of sufficiently complete and precise data, currently no database seems to be sufficiently suitable for cross-country policy analysis in the postal industry. Although firms are generally reluctant to provide precise data, the data for research not necessarily has to be up to date. If there would be a lag of two or three years between the generation and the disclosure of the data, there could be a useful set provided which keeps the interests of the research community, the policy-making institution as well as the firms active on the markets in balance, a view which is clearly shared by Boldron, Cazals et al. (2009), which also state the „need for a better database“ (p. 13).

Limitations of the data include that there was a relatively small number of observations left, especially if growth rates or differences were computed, leading to the loss of another year in the time dimension. An ideal dataset would include harmonized and complete data from official statistics. Comparable data on prices and competition measurements, such as Herfindahl indices or concentration ratios like the market share of the largest firm in a well-defined market (CR1) or the joint market share of the three biggest companies (CR3) were completely unavailable.

Overall, the importance of precise data to evaluate policies and estimate the likely impact of different regulatory settings being discussed is especially high in industries which are undergoing rapid changes as the postal industry at the moment. The test of the inclusion of a variety of new indicators and variables could provide significant advantages when it comes to the creation of the optimal regulatory conditions in order to focus on market growth.

Deeper understanding of the regulatory influence on the overall market development not only could lead to improved regulatory conditions but could also uncover further drivers of business development. Thus this chapter is intended to serve as a starting point for a debate about the impact of postal regulation based on solid statistical evidence.

Although the postal sector is much older than the telecoms sector, data availability is much more limited due to the slower introduction and development of regulation and competition than it is in the telecommunications sector and due to the regulators' parsimony to postal data collection. Especially when it comes to future regulation, improved data availability might provide important insights; although theory says, that the market can largely be left unregulated, it could be expected, that regulators might try to "advance" competition in a direction they believe it is right rather than to know what the real impact and possible costs are.

Therefore, a comprehensive database containing much more detailed information than the existing databases would be very helpful for research and policy work. Data availability, comparability and correctness thereby are more important than immediate disclosure.

Chapter 3

Social Regulation: The German Postal Minimum Wage Case

Increasingly, the postal industry is under pressure for transformation to respond to changing conditions resulting from market liberalization, emerging competition and structural changes in demand. This situation as well as proposals to privatize the national incumbent operators (where they are still run as a public entity) widely lead to concerns of employees, unions and politicians that the transition could worsen the working conditions in the industry, and that in the extreme case precarious conditions might emerge from low-quality-cheap-prices business models, where market entrants' cost advantages are mainly based on low wages and social standards. Therefore, not only the evolution of economic regulation such as pricing regulation is under discussion, but also socioeconomic and sociopolitical issues like the further development of social regulation, ranging from universal service obligations to specific employment regulations.

Although other industries in which the operators were mostly monopoly-protected public entities with the employees having civil servant or public employee status (such as telecommunications) were liberalized before, these aspects have not been as prominent as in the postal industry even though also in these industries the workers often enjoyed significant wage differentials over comparable jobs in private firms. The special importance of the policy goal to preserve socially acceptable conditions for the postal industry stems from the distinctive fact, that the by far largest share of the operating expenses has to be accounted to labor costs and is reinforced by the expected decline of demand in many markets of the industry.

One of the most controversially discussed policy instruments to achieve this goal is the introduction of a sector-specific minimum wage for the postal industry. While the proponents of such a legislation argue, that such minimum wages

avoid “unfair competition” at the expense of the postal workers and that they are needed in order to level the playing field between entrants and the former monopolist (since the wages of the incumbent operator cannot be swiftly reduced to a competitive level), the opponents argue, that such minimum wages could not only raise prices but also hamper employment and, moreover, inhere the danger to be strategically exploited as a competition-deterrence device. Bonini et al. (2006) provide a broader overview over different areas of social regulation and their strategic implications.

In this article, we analyze the case of the minimum wages in the postal industry in Germany from the public discussion mid-2007 to their introduction in January 2008 and until their expiry end of April 2010 from the latter competition perspective. We describe the collective bargaining system and the case of the minimum wages in the postal industry in Germany and discuss the case with regard to our respective article (Heitzler and Wey 2010). We describe in section 3.1 the legal foundations of collective bargaining in Germany and the regulations which transform collective wage agreements into generally binding minimum wages. Section 3.2 provides an extensive discussion of the Deutsche Post case, section 3.3 highlights the raising rivals’ cost incentives and their consequences when the collective wage agreement becomes generally binding. Section 3.4 concludes.

Our work is related to Williamson (1968) and contributes to the literature linking the raising rivals’ cost literature (Salop and Scheffmann 1983, 1987), the literature on entry barriers (Dixit 1979, Rogerson 1984) and the literature analyzing the interaction between monopolized labor markets and oligopolistic product markets (“unionized oligopolies”, cf. Dewatripont 1987, 1988, Horn and Wolinsky 1988a, 1998b, Haucap, Pauly and Wey 2001).

3.1 The collective wage bargaining system in Germany

In this section, we briefly describe the legal foundations of the German system of collective bargaining and the traditional procedure of declaring wage contracts as generally binding by means of extension regulation. We then explain how the most recent minimum wage legislation has significantly increased the scope for making wage contracts generally binding.

The legal basis of collective bargaining

In Germany, wage bargaining occurs primarily at the sectorial level between an industry union and an employers' association representing most of the firms in the industry.¹ Those collective negotiations usually result in standard wages and labor contracts which cover most of the firms and workers in the industry. This so-called area tariff system ("Flächentarifsystem") still dominates the German labor market. As has been argued by Haucap, Pauly and Wey (2006, 2007) the stability of the area tariff system in Germany is mainly externally supported by various labor market regulations which systematically protect the collective bargaining system against deviant behavior and outside competition.

One core institution of the German collective bargaining system is the so-called tariff autonomy ("Tarifautonomie") which empowers unions, employers and employer associations to form coalitions and to bargain collectively.² The principle of tariff autonomy protects the constitutional right of the "social partners" to agree upon collective agreements on their own and, with that, makes outright minimum wage setting through state intervention virtually impossible.

The legal nature of the collective bargaining process is specified in the Collective Agreements Act ("Tarifvertragsgesetz", TVG). According to the TVG, only the tariff parties (unions, firms, and employer associations) can conclude collective labor contracts. Most unions (as the united services union "Vereinigte Dienstleistungsgewerkschaft", in short: Verdi) are organized within the German confederation of trade unions ("Deutscher Gewerkschaftsbund", DGB). While there is no doubt that all unions which are members of the DGB have the right to conclude tariff agreement, this is typically not the case for outsider unions.³ In fact, as summarized in Haucap, Pauly and Wey (2006, pp. 365ff.), legal practice and the legal literature have arranged extremely restrictive conditions which have

¹Labor markets and labor laws differ substantially between countries (see, e.g., Nickell 1997, OECD 1997, or Blau and Kahn 1999), where a salient dimension that differentiates national labor markets is the degree of wage setting centralization (Calmfors and Driffill 1988 and Wallerstein 1999). From this angle, Germany's collective wage bargaining system is somehow positioned in the middle between a decentralized system (with collective bargaining at the firm level) and a fully centralized system (with collective bargaining at the national level).

²The legal grounds for the tariff autonomy can be found in Article 9 Paragraph 3 of the German Constitution ("Grundgesetz") and the law concerning tariff agreements ("Tarifvertragsgesetz").

³The case of the Christliche Gewerkschaft Metall (CGM), which is a member of the Christliche Gewerkschaftsbund (CGB), is instructive in this regard. Ever since its appearance, the dominant union Industriegewerkschaft Metall (IGM) (which is member of the DGB) has continuously tried to challenge the right of the CGM to strike collective agreements (see Haucap, Pauly and Wey 2006).

to be fulfilled by worker associations in order to be eligible to conclude collective agreements (see also Wiedemann and Stumpf 1977, pp. 357ff.).⁴

The TVG states that, in general, only members of the bargaining parties are actually bound to obey the regulations of the tariff contract. In practice, though, a firm which is member of an employers' association pays the tariff wage to all of its employees (for the reasons see Haucap, Pauly and Wey, p. 363), although on June 23, 2010, the Federal Labour Court weakened the system by allowing the application of multiple competing tariff agreements within one firm (FLCE 2010).

Traditional extension rule

While there are many stabilizers of the area tariff system, a stabilizer of last resort is provided by the possibility to make collective bargaining contracts compulsory for all unorganized employers (and hence, all) unorganized workers) within an industry by an extension rule. Specifically, paragraph 5 of TVG provides the bargaining parties with such a device, the so-called "Allgemeinverbindlichkeitserklärung" (AVE).

The first prerequisite to declare an employment contract to be generally binding is the existence of a collective bargaining agreement in accordance with TVG; i.e., a collective contract between a union and an employer association at the industry level. Secondly, at least 50 % of employees in the tariff area for which an AVE is initiated have to be employed in firms of contract-bound employers and the AVE must be "in the public interest".

The implementation of the AVE is regulated by the TVG. Initially, one of the bargaining parties must apply for an AVE at the Ministry of Labor. Concerning unorganized employees and employers as well as employer associations, unions and the Ministry of Labor of the state affected by the AVE are given the right to express their opinion. Afterwards a public hearing of a council consisting of three representatives of umbrella organizations of unions and employers respectively ("Tarifausschuss") is initiated. The council then decides with the majority of votes whether or not to recommend the use of an AVE to the Ministry of Labor. Though the Ministry of Labor is not bound by the council's recommendation, it nevertheless has proved to affect the ministry's final decision.

⁴An exceptionally restrictive condition is the so-called mightiness ("social power") requirement which unfolds a vicious circle that ultimately counters attempts to establish a new rival union. According to the Federal Labor Court an indication for the existence of social power comes from the fact whether the union already concluded collective agreements. Obviously, the incumbent union meets this requirement but a new union can hardly refer to collective contracting in the past.

Once an AVE has been put into force, it remains effective until the collective bargaining contract expires or the Ministry of Labor puts the AVE out of force.

Posted Workers Act

The Posted Workers Act (“Arbeitnehmer-Entsendegesetz”, AEntG) came into force in 1996 and has been revised several times later on (the latest version dates back to April 20th, 2009). Its original objective was to ensure binding labor standards for workers employed by businesses of foreign origin (with a focus on construction workers). Yet, right from the beginning it was clear that the act could also be used to force all employers (including non-organized domestic firms) in a certain sector to adhere to the same working standards and, in particular, minimum wages. Nowadays, the Act’s main purpose has become to enforce minimum wages in several service sectors on domestic firms.

The Posted Workers Act reduced significantly the bar for the German Federal Ministry of Labor to implement minimum wages when compared with the traditional extension rule according to the TVG. First, it allows to declare a collective wage contract as generally binding even if less than 50 % of the employees of the tariff area concerned are employed by contract-bound firms.⁵ Second, until 2009 the Act did not require a public hearing of a council consisting of the involved umbrella organizations.⁶ Finally, the Ministry of Labor can declare a wage contract generally binding by legal decree (“Rechtsverordnung”) without having to go through a complicated procedure as required under the TVG.⁷

The Act does not apply automatically to all service sectors. Instead, the Act explicitly states the sectors which can apply for a minimum wage ruling. Initially, the Act only mentioned the construction industry. By the end of 2007 (shortly before full liberalization), mail delivery services and, most recently, several other sectors have been added (as, e.g., commercial cleaning and waste management, while nursing is currently on its way to be included).

⁵In the latest version of the Posted Workers Act a representativeness requirement was introduced which applies to those industry where competing collective labor contracts exist. A collective contract is more “representative” if both the number of workers employed by contract-bound employers and the number of union members affected by the tariff agreement are larger (see also Blanke 2007).

⁶In its latest version of 2009, the Posted Workers Act was supplemented by a paragraph which requires the Ministry of Labor to ask the involved bargaining parties as well as the parties of competing collective agreements (if applicable) for their statements.

⁷For example, under the TVG the Labor Ministry of a Land can block an AVE. In this case, the Federal Ministry of Labor must ask the Federal Government for permission.

3.2 The postal industry minimum wage case 2007-2010

In Germany, the transition period towards market liberalization started on January 1st, 1998 with the implementation of the first EU Directive on postal service markets.⁸ Initially, the date for full liberalization and the abolition of the remaining legal monopoly was planned to be January 1st, 2003 but the German federal government decided prior to that date to postpone the date for five years. During winter 2006/2007 it became clear, that the Federal Government was committed to the January 1st, 2008 as the date for the full market opening.

The road towards minimum wages

In the forefront of the full liberalization of the postal market, labor unions (especially Verdi) and several political parties called for the introduction of a generally binding minimum wage for the industry. Their main argument was that wage dumping at the expense of established postal workers should be prevented this way and the debate was intensified by the release of a study on the allegedly precarious employment conditions at the postal service competitors (Input Consulting 2006).⁹

During the years of the liberalization process Deutsche Post had already significantly restructured operations; e.g., through outsourcing of its post offices and transport services, but the mail delivery network has been kept inhouse. Until full liberalization in 2008, the reserved area included letters up to 50 grams (with some exceptions for large senders). At that time, virtually all operators who had entered the non-reserved segments of the market provided end-to-end services, many of them at a local or regional level, competing with Deutsche Post through alliances. Thereby, the competition that emerged was primarily in the area of value-added services as little requirements had to be fulfilled to operate outside the reserved area (Dieke and Wojtek 2008).

Deutsche Post claimed that its disadvantage of having relatively high wages due to the former legal status of its employees as civil servants requires the implementation of minimum wage legislation in order to ensure a level playing field

⁸In the EU, the stepwise liberalization process of the market for postal services is governed by three EU Directives; namely, Directive 97/67/EC, Directive 2002/39/EC, and Directive 2008/06/EC, where the latter one requires the member states to abolish any remaining reserved areas by the end of 2010, with some exceptions until the end of 2012.

⁹Therefore, these developments represent a textbook example of the expected concerns described by Bailly and Meidinger (2010).

when the market was fully accessible to competitors. On the one hand, Deutsche Post claimed that they would not be able to compete in public procurement tenders anymore, while on the other hand, low wages at the competing firms led to social security transfer payments to the workers employed at these firms, thus leading to a subsidization of the competitors. Therefore, the minimum wages should also serve as a flanking measure to liberalization in order to avoid such transfers.

During the summer of 2007, the momentum on this issue further increased and the lawmakers stepped in and formalized the social expectations. In August 2007, the grand coalition of the federal government agreed upon the introduction of minimum wages in the postal sector via amendment of the Posted Workers Act, leaving the exact details open until the end of 2007.¹⁰ Shortly after this decision, a swift series of strategic moves by the involved parties followed.

On August 28th, 2007, the Postal Employer Association (Arbeitgeberverband (AGV) Postdienste) dominated by the Deutsche Post and its subsidiaries was established. Subsequently the competitors proclaimed that this establishment was a strategic move to implement excessive minimum wages in order to squeeze them out of the market after the full market opening.¹¹

On September 4th, 2007, the newly founded AGV Postdienste and Verdi reached a collective wage agreement which was intended to serve as the reference contract for minimum wages in the postal service sector.¹² Accordingly, the contract was submitted to the Federal Ministry of Labor and Social Affairs to be declared as generally binding. The agreements stipulated a general minimum wage per hour of € 8.00 in East Germany and € 8.40 in West Germany. Additionally, the minimum wage for mail delivery was set even higher at € 9.00 and € 9.80, respectively. Thereby, the minimum wages should have become effective on December 1st, 2007.¹³ Interestingly, the contract provided an extraordinary termination clause which became effective if and only if the contract would not have been declared as generally binding as an industry-wide minimum wage.¹⁴

¹⁰See “Bundesregierung beschließt Mindestlohn für Brief-Branche”, August 22nd, 2007 (www.post-und-telekommunikation.de).

¹¹At court hearings in 2009, the main competitors claimed that they did not have the opportunity to join the association or to take part in the negotiations. Cf. German Parliament, Commission for Labor and Social Affairs, meeting protocol 16/65, statement of F. Gerster, p. 875.

¹²The contract is posted on the website of AGV Postdienste (www.agv-postdienste.de).

¹³See “Mindestlohn im Postbereich vereinbart,” Handelsblatt online (www.handelsblatt.com). The tariff contract was signed on 29 November, 2007 (www.verdi.de).

¹⁴Precisely, article 6, paragraph 3 of the tariff contract stipulates: “Both parties have an extraordinary termination right if the contract is not declared generally binding according to

To investigate the actual working conditions in the postal industry, the Federal Network Agency (“Bundesnetzagentur”) conducted a survey about working conditions and wages at licensed postal service operators from summer to autumn 2007 (BNetzA 2008). Table 3.1 provides an overview.

Table 3.1: Industry wages before the introduction of the minimum wage

	Deutsche	Competitors		
	Post AG	West	East	Average
Sorters	11.34	8.10	6.11	7.68
Drivers	11.99	8.08	6.23	7.73
Delivery postmen	12.13	7.71	6.18	7.28
Administrative staff	16.01	11.24	9.23	10.97
Average	13.04	8.23	6.38	7.79

Source: BNetzA (2008).

Focusing on wages per hour for postmen, table 3.1 clearly shows that the tariff agreement between AGV Postdienste and Verdi set minimum wages which exceeded the average wage rates paid by competitors by 20 to 30 %, although the average wage rate of € 12.13 calculated for the Deutsche Post should be treated with caution. This relatively high wage rate reflects, to a certain part, Deutsche Post’s burden of having senior postmen who still enjoy the benefits of civil servant status or similar working contracts. However, the wage rate that Deutsche Post’s partner firms have been paying for new employees (including postmen) were substantially lower and have been even lower than the minimum wage set in the tariff contract between AGV Postdienste and Verdi.¹⁵

Immediately, the competitors complained heavily about the level of the wages and the procedure how the tariffs have been agreed upon. The coverage of the tariff agreement was another issue of importance. Initially, it was planned that the tariff agreement should hold for all firms delivering letters no matter of the firms’ core business (as, e.g., publishing and newspaper delivery). By November 29th, 2007, the draft of the wage contract was revised such that it only applied

the Collective Agreements Act and the Posted Workers Act. In that case [...] the contract can be terminated within a period of one week by the end of the calendar month.”

¹⁵For details, see BNetzA (2008) and Dieke and Zauner (2007). Considering other industries where minimum wages existed in Germany, the wages per hour were not as high as, e.g., for construction workers, but higher than for other industries with comparable qualification requirements, e.g., facility security or cleaning services.

to firms with letter delivery being their core business.¹⁶ The main competitors responded on September 18th, 2007, with the establishment of another employers' association "Arbeitgeberverband Neue Brief- und Zustelldienste" (AGV Neue BuZ) which stated that a minimum wage would be reasonable and acceptable if it was between € 6.00 and € 7.50.¹⁷

Furthermore, a new union for letter and delivery services (Gewerkschaft Neue Brief- und Zustelldienste, GNBZ) was founded which agreed upon a wage contract with the new employer association AGV Neue BuZ, stipulating a general minimum wage per hour of € 6.50 and € 7.50 for East Germany and West Germany, accordingly. That contract was also submitted to the Federal Ministry of Labour as an alternative proposal for a mandatory minimum wage.¹⁸

The minimum wage critically depended on a revision of the Posted Workers Act by adding letter delivery services to the sectors eligible for a minimum wage regulation. Market surveys conducted by the Federal Network Agency revealed that the introduction of a minimum wage by means of the extension rule of the TVG would be problematic, as the wage contract between AGV Postdienste and Verdi hardly represented at least 50 % of the employees in postal delivery services that had to be employed in firms of contract-bound employers according to the TVG (BNetzA 2008).

On December 20th, 2007, the amended Act (BMAS 2007) which now included letter services, was passed by the Upper House ("Bundesrat"). On December 28th, 2007, a decree was issued by the Federal Labor Ministry, declaring the wage contract between Verdi and AGV Postdienste generally binding for all mail service providers. The decree became effective on January 1st, 2008, and was set to expire by April 31st, 2010.

Since then, there were no further legislative attempts to re-introduce a sector-specific minimum wage for the letter mail sector. Recently, however, the issue re-appeared in the media. According to a newspaper article, a report of the Federal Network Agency is going to appear which will contain an investigation of the wages. The wages reportedly are mainly in the range between € 6.00 and € 8.00 per hour. Subsequently, the communication union DPV already re-called for an industry-specific minimum wage of € 9.80, whereas the Federal Network Agency does not consider this an issue which justifies them to step in.¹⁹

¹⁶See "Koalition einigt sich auf Post-Mindestlohn," Spiegel online, November 29th, 2007 (www.spiegel.de).

¹⁷See Press Release of the AGV Neue BuZ, September 27, 2007 (www.agv-nbz.de).

¹⁸See BdKEP Press Release, 12 December, 2007 (www.bdkep.de).

¹⁹Cf. Streit um Briefmarkt-Niedriglöhne, faz.net, 23.11.2012.

The impact on competition

The extension of the wage contract between Verdi and AGV Postdienste by means of the Posted Workers Act had a significant impact on the competitors' businesses. According to a statement of the German Federal Government, 153 postal service companies shut down operations in 2008-2009 and about 19,000 jobs had been cut.²⁰ Nevertheless, although the minimum wages are considered frequently as the main source of these market developments, additional factors like the overall difficult situation and managerial errors might have contributed significantly to the observable developments.

In the first quarter of 2008, the PIN group filed insolvency after its main shareholder, the Axel Springer group, had ended support for its postal operations already in December 2007. Since then, the PIN group has been run by an insolvency administrator. During this period, the group paid the minimum wages while being subsidized out of public social security funds (Ecorys 2008a). In the first quarter of 2008, about 50 % of formerly about 11,400 jobs have been slashed, so that the delivery network has been cut down substantially (already in February 2008, 37 of approximately 91 companies of the PIN group filed bankruptcy). While the insolvency administrator tried to preserve the PIN group as a whole, it turned out, that the selling of the different regional companies separately was a more viable solution. The publishing house Holtzbrinck acquired twelve PIN firms in metropolitan areas. In mid-sized cities regional publishers took over several other PIN firms. Subsidiaries of PIN in smaller towns and rural areas often could neither be preserved nor sold to other firms and had to shut down operations.

Turning to the other main competitor TNT, the picture is somewhat different. Right after the introduction of minimum wages, TNT announced that it is "considering withdrawal from the German market" as a consequence of the minimum wage, but this point seemed to lose prominence over time, especially against the background of the insolvency of the other main competitor PIN. Interestingly, TNT decided not to pay the minimum wages but kept its own lower wage rates effective. This decision, though, put an additional financial burden on the company as it had to build up reserves for the wage differential and associated social security contributions.

²⁰See the reply of the Federal Government to the inquiry of the parliamentary group of the liberal party (FDP) (available at <http://dip21.bundestag.de/dip21/btd/16/091/1609192.pdf>) and Press Release of the Federal Network Agency (available at <http://www.bundesnetzagentur.de/media/archive/15280.pdf>).

Finally, as competing postal operators relied on building alliances with partner firms to reach nearly full geographic coverage, market exit of small regional players has resulted in reductions of the main competitors coverage. For example, it is documented in Ecorys (2008a) that as a consequence of partner insolvency, the coverage of the TNT network including allied partners went down from 93 to 87 % in Germany. However, shortly after the Federal Administrative Court declared the minimum wages void, TNT announced new plans to extend its area coverage and delivery frequency. By January 2010, TNT, Holtzbrinck, Madsack, Citipost and some other companies in the mailing industry founded the Mail Alliance which started operations on January 25th, 2010.²¹

Despite the difficulties for the competitors during the minimum wage period, the remaining competitors managed to compete, although the development of competition has been limited. Over the period 2008-2010, according to the Federal Network Agency (BNetzA 2011), the trend towards cooperations and the overall economic recovery in 2010 (p. 133) helped the remaining alternative operators to increase their share of the letter mail market from 8.1 % to 10.2 %, their revenues from € 800m to € 900m, and the number of their employees from 16.000 to 17.000 full time equivalents (pp. 137-138).

As of December 2012, the cooperation trend of the competitors is still ongoing. The Mail Alliance and another large group, P2 Brief+Paket, announced to form an alliance to achieve a high-coverage alternative postal delivery network (covering at least 80 % of all households) from April 2013 onwards to pursue the goal to significantly increase their combined market share.²²

Legal disputes

With the implementation of minimum wages, a series of legal disputes has been triggered which took two years to settle, while the period of the law was set to two years and three months anyhow. On January 9th, 2008, TNT and other competitors (organized in the new employer association AGB Neue BuZ) filed a lawsuit against the German Federal Government. They insisted on their constitutional right to conclude a collective wage agreement on their own (namely, the tariff contract concluded in 2007 between the AGV Neue BuZ and GNBZ). On March 7th, 2008, the Berlin Administrative Court (“Verwaltungsgericht Berlin”)

²¹Their offerings are limited to firms and institutions, but include hybrid mail. Coverage is claimed to be nation-wide with a conveyance speed of E+2. The wages paid by the companies of the alliance are mainly in the range of € 6.50 to € 7.50 (see the Mail Alliance’ website: www.mailalliance.net).

²²Cf. ”Verhandlungen über Zustellnetz kurz vor Abschluss”, Christian Schlesinger, wiwo.de, 03.11.2012.

declared the minimum wage void. The court argued that the Federal Government was not empowered by the Posted Workers Act to overturn a competing collective contract by declaring another collective tariff contract as generally binding. By that, the court clarified that a minimum wage can only be imposed on employers and workers not bound to any tariff agreement (BAC 2008). The Federal Ministry of Labor and Social Affairs appealed the decision, but the preceding decision was confirmed by the Higher Administrative Court Berlin (“Oberverwaltungsgericht Berlin”) on December 18th, 2008 (BHAC 2008).

After the Federal Labor Ministry appealed for a second time, on January 28th, 2010, the Federal Administrative Court (“Bundesverwaltungsgericht”) finally judged the declaration of the minimum wage void due to another formal defect. In its decision, the court argued that the Federal Labor Ministry had failed to give other affected parties the opportunity to comment prior to issuing the ordinance. As a consequence, the minimum wage was not binding for the plaintiffs from its beginning on, while it remained in force for unorganized competitors who did not go to court.

Furthermore, already on February 13th, 2009, a new amendment of the Posted Workers Act was put into force which should cure the Act’s shortcomings when more than one collective contract has been concluded in the same sector. First, the amendment specifies a new “representativeness” criterion which should guide the Federal Labor Ministry’s decision concerning the choice of the tariff contract as the basis for an extension rule when more than one collective contract exist. Second, the amendment incorporates a procedure of hearings of the affected parties into the Act which was missing in the former version. Those amendments have been acknowledged by legal experts as sufficient to guarantee that a minimum wage based on the collective contract between Verdi and AGV Postdienste could stand the test of a labor court but would have required to repeat the extension procedure from beginning on (Blanke 2007).

The new amendment is closely related to Verdi’s accusation that the new union GNBZ was not empowered to conclude collective labor contracts. Verdi argued that the GNBZ does not meet the minimum standards a “tariff-enabled” union must fulfill according to the TVG. Blanke (2007) provides an example for an expert’s report which argues that the new union should not be regarded as tariff-enabled according to the TVG. He also argues that the “representativeness” criterion of the revised Posted Workers Act requires to neglect the competing collective agreement.

On October 30th, 2008 the Cologne Labor Court shared this view and denied that the GNBZ is a tariff-enabled union in the sense of the TVG (CLC 2008). Accordingly, the wage contract between AGV Neue BuZ and GNBZ was declared void by the court. This court ruling together with the Federal Government's political commitment to find ways to implement minimum wages has been inflicting considerable uncertainty on the viability of the competitors' future businesses. Both, GNBZ and AGV Neue BuZ, appealed against the court ruling, but both parties withdrew their appeals.

At the European level, the claimants also filed complaints about the law, but since the regulation of the labor markets is outside of the competence of the European Union and fully under the authority of the member states, the European Commission did not open any procedures.²³

Currently, there are no legal disputes ongoing. However, as there is currently a new Postal law under preparation, the Monopoly Commission requested to drop the so-called social clause (which requires equal conditions for comparable tasks at comparable locations) and to leave this aspect to social laws (Monopolkommission 2011, pp. 56-57), which might help to avoid legal disputes in the future. Although mainly for concerns with regard to the competition control by the Federal Cartel Office and to the lacking powers of the Federal Network Agency to encounter potential anti-competitive conduct, on November 2, 2012, the Federal Council (Bundesrat) has rejected to recommend the current draft to the Federal Parliament (Bundestag).²⁴ Thus, whether the case of postal minimum wages in Germany is finally closed or not remains to be seen.

²³At the EU level, the Federal Association of International Express and Courier Companies ("Bundesverband Internationaler Express- und Kurierdienste") filed a complaint addressed to the European Commission. It was argued that the minimum wage agreement's only objective was to block competition. In addition, TNT filed a complaint against the German government based on Art. 82 of the European Treaty. It was claimed that the minimum wage decree leads to an unfair infringement on competition and violates the freedom to establish business throughout the European Union by raising rivals' costs. The European Commission examined the issue but decided to abstain from opening a procedure.

²⁴Cf. Pressebox (12.11.2012): Press release BoxID 554227: Postgesetz vorerst abgelehnt.

Table 3.2: Postal minimum wage in Germany: Timeline

01.01.1998	Introduction of gradual liberalization of postal markets in Germany
15.07.2007	Chancellor Angela Merkel rejects the introduction of a postal minimum wage for 2007
21.08.2007	Establishment of Postal Employers Association (AGV Postdienste), member of BDA
04.09.2007	Verdi and AGV Postdienste agree on minimum wage for postal services from 1st December 2007 on
05.09.2007	Complaints of competitors concerning the negative impact on competition
06.09.2007	BNetzA supports the competitors claim
08.09.2007	Federal Ministry of Economics and Technology (BMWi) shares the concerns
10.09.2007	Federal Employers Association (BDA) and CDU express same concerns
12.09.2007	Establishment of competing employers association Arbeitgeberverband neue Brief- und Zustelldienste (AGV Neue BuZ)
18.09.2007	BDA, Bundesverband der Zeitungsverleger, Bundesverband der Kurier-, Express- und Paketdienste (BdKEP), Bundesverband der Neuen Brief- und Zustelldienste
19.09.2007	Government coalition: Only letter services instead of all postal services should be covered by minimum wage
23.09.2007	Coalition disagrees on topic
09.10.2007	VAT exemption proposed - competitors defeat
10.10.2007	Competitors-employed announce to establish an <i>anti-union</i>
12.10.2007	SPD fails with general minimum wage plan and extension of AEntG
29.10.2007	Federal Network Agency issues recent figures on employment in the postal sector: Less than 50 % of all workers covered
01.11.2007	BMWi supports that position and opposes again
02.11.2007	BMAS and SPD consider the quota as fulfilled
02.11.2007	CDU refuses to adopt the extension of the AEntG

(Continued on next page)

06.11.2007	Springer tries to sell PIN to TNT (bought end of June)
14.12.2007	Bundestag accepts minimum wage draft bill
21.12.2007	TNT threatens with operations withdrawal
21.12.2007	7 out of 91 PIN companies register for insolvency
28.12.2007	Minimum wage legislation (Bundesrat) and minister decree: Gross minimum wages for sorting workers € 8.00 (east) and € 8.40 (west), and € 9.00 and € 9.80 for letter-delivering workers, respectively
01.01.2008	Full Market Liberalization in Germany
09.01.2008	Competitors file lawsuit against the German government
25.01.2008	PIN AG requests insolvency procedure
07.03.2008	Administrative Court Berlin (VG Berlin) declares minimum wage void
20.03.2008	TNT expresses optimism concerning its future in Germany
31.03.2008	About 50 % of about 11400 jobs shed at PIN
19.06.2008	DG Internal Market: Commissioner Charlie McCreevy an- nounces infringement procedure preparation
23.09.2008	TNT announces thoughts about delivery speed improve- ment (E+2 to E+1 service)
30.10.2008	Labor Court Cologne (AG Köln) decides that GNBZ cannot make tariff-agreements
22.01.2009	AEntG changed, parliament (Bundestag) decision
13.02.2009	Bundesrat accepts new AEntG
28.01.2010	Federal Administrative Court (Bundesverwaltungsgericht) fi- nally declares minimum wage rules void for the plaintiffs that went to court
31.04.2010	Expiry of minimum wage ordinance (by sunset clause)
15.12.2011	Monopoly Commission recommends to drop the social clause in their special report on the postal industry

3.3 Minimum wage regulation and raising rivals' costs

Throughout Europe, 1.6 million people are employed directly in the postal sector with an average age above 40 years and mainly low to medium qualification levels. Especially in this industry, the need to adapt to large mail volume decreases and tailoring the networks to demand and profitability as well as increased competition leads to the necessity of business model revisions, workforce optimization with a decrease in employment volume and the evolution of jobs' nature and status. As in other industries, where wage cost represent a very large share of the overall cost, efficiency goals likely involve downward pressure on wages (Wachter et al. 2001). Although there are some counter-strategies as, e.g., diversification, there is generally a trend toward modernization of the postal networks involving automatization and delivery optimization which in turn lead to decreasing employment and other social consequences such as the simplification of tasks and the flexibilization of the workforce through part-timers and external workers (SDCPS 2010).

New social standards and social regulation aim to address these undesired consequences of the liberalization and the related introduction of competition, such as “unfair competition” at the expense of the postal workers or to level the playing field between the starting position of former monopolists and entrants into the respective industry. This growing importance of social regulation is also reflected in the third European Framework Directive addressing the concern and aiming to prevent social and wage dumping in the context of the full market opening. Thereby, the main goal of social regulation is to achieve “fair competition at socially acceptable conditions despite the needs for operational and social optimization of their activities, [...] although it is sometimes challenged as being hampering the sector evolution through the creation of entry barriers” (Bailly and Meidinger 2010).

One of the most controversially debated issues are especially industry-specific minimum wages, since such minimum wages not only are means to stabilize the social conditions during the introduction of competition, but in turn also might lead to drawbacks. The potential adverse effects include rising prices and the introduction of new limits to competition, especially in industries where an oligopolistic rather than a fully competitive industry structure can be expected due to network effects and/or economies of scale.

If the minimum wages are not set nationwide but for a certain industry, they could in particular represent powerful tools to raise rivals' costs and inhere the danger to be strategically exploited as an entry-deterring device. This strategy might not only be profitable for the incumbent firm but also the unions might be interested in pursuing such a deterrence strategy, since the incumbent may profit from reduced competition and the union from higher wages of their members. Such a situation may especially arise in cases, where the workers of the entrant firms are organized less and thus the unions are representing primarily the employees of the incumbent.

The case in relation to our model

In the following chapter based on our article (Heitzler and Wey 2010), we provide also a model of the case of the minimum wages in the postal industry in Germany, where we theoretically analyze the research questions, *i*) what the conditions are such that both a union and the incumbent agree on an entry deterring wage, *ii*) whether there are instances such that a even more efficient competitor can be deterred from entry through minimum wages and *iii*) whether there are instances where overall productive efficiency decreases through minimum wages.

In the basic setting, we model two (postal) operators providing their services with full (geographic) coverage at positive non-labor marginal costs plus fixed labor costs to run their delivery network, facing a linear demand. Thereby, we allow their non-labor marginal costs to differ in order to reflect their relative cost efficiency what might be in favor of the incumbent as well as the entrant. Concerning the workers, we assume for simplicity, that all workers of the incumbent firm are represented by a union (with identical and sufficiently low reservation wages), while the workers at the entrant firm are not organized at all. The union is assumed to maximize the wage bill of their members (since unions often receive simply a share of their members' wages as membership fees). The game follows a two-stage timing where in the first stage the union and the incumbent firm Nash-bargain about the wage rate and in the second stage the two firms compete à la Cournot.²⁵

For the analysis, we consider two alternative regimes concerning the existence of an extension rule which makes the wage agreed upon by the incumbent and

²⁵We interpret Cournot competition in the sense of Kreps and Scheinkman (1983) such that the postal operators are assumed to set first their mail capacities and then compete in prices. As shown by the authors, that game yields the Cournot outcome if products are homogeneous. In addition, we suppose that both firms' mail delivery networks are sufficiently large to guarantee a certain delivery quality for their supplied mail volumes.

the union generally binding for all firms in the industry. Without the extension rule, the entrant pays its employees their reservation wage, while the wage rate negotiated between the union and the incumbent firm applies only to the employees of the incumbent firm. In contrast, if an extension rule is in place, then the entrant firm must pay the (minimum) wage which is determined jointly by the union and the incumbent firm.

The results from our model confirm the existence of the incentives to raise fixed costs in the industry in order to deter entry. More precisely, *i*) the incentives to raise the fixed costs of all firms in the industry increase with decreasing cost efficiency of the competitor and *ii*) entry is deterred for sure in some cases with strictly positive probability. Furthermore, *iii*) the expected wage rate, the union's (expected) wage bill and the incumbent's (expected) profit are all strictly larger under an extension rule.

In an extension of the model, we abstract from efficiency differences and relax the assumption that the entrant provides full network coverage, since the entrant may choose its network size freely while the incumbent is assumed to be obliged to provide full coverage by universal service obligations. In this extension, we add an investment stage at the beginning of the game, where the entrant incurs sunk costs to build up its delivery network in this initial stage, while the fixed labor costs of operating the network in the subsequent game (as in the base model) increase linearly in network coverage.

In the extended model we show, that in the regime with a generally binding wage, entry is also deterred completely in some situations (depending on reservation wages and demand conditions), while under all conditions the investments and the network coverage are strictly smaller with an extension rule in place.

The case in relation to the literature

Our analysis is also related to the literature on entry barriers (Dixit 1979, Rogerson 1984). Most importantly, Rogerson (1984) shows that under symmetric cost conditions a dominant firm has incentives to raise fixed entry costs. In his model, the level of fixed entry costs is exogenously given (since no vertical structure is taken into consideration), while in our analysis the fixed labor costs of operating a mail delivery network are the outcome of negotiations between the union and the incumbent operator, which in turn leads to the strategic role of the union and the incentives (depending on the share of organized workers at the entrant firm) to raise industry wages in favor of the incumbent firm. In consequence, both, the union and the employers' association may have both incentives to agree on a

minimum wage to deter entry. Even small labor productivity advantages of the incumbent firm cause an incentive for raising rivals' (variable labor) costs. While typically minimum wages increase productive efficiency, this may not hold any longer in our setting, since even more efficient rivals can be deterred effectively.

The case where employers and a union increased (variable) labor costs has been analyzed in the related paper of Williamson (1968). He showed that an incumbent firm may pursue the strategic goal to accept high wage rates if this also raises rivals' costs (see also Haucap, Pauly and Wey 2001). Precisely, Williamson analyzed the so-called Pennington case and he argued that an industry-wide wage contract which increases the cost of relative labor-intensive firms to a larger extent than the costs of relative capital-intensive firms can be used to force labor intensive firms to withdraw from the market.

Quite generally, the raising rivals' cost literature assumes that the strategic variable (as, e.g., a generally binding minimum wage rate) impacts directly on firms' variable costs.²⁶ In those settings a necessary condition for making a raising rivals' cost strategy profitable is that the rival firms' labor productivity (in the case of wage being the strategic variable) is smaller than the firm's labor productivity which executes the anticompetitive practice. As a consequence, in papers considering variable labor costs, overall productive efficiency is likely to increase as the more productive firm gains market shares while less productive firms lose market shares.

Overall, through the combination of these approaches, our model delivers new insights on the nature of union-firm bargaining when labor costs are fixed instead of variable costs and the effects of labor laws which make wage contracts generally binding. It thus also extends the literature analyzing the interaction between monopolized labor markets and oligopolistic product markets ("unionized oligopolies", see Dewatripont (1987, 1988), Horn and Wolinsky (1988a, 1988b), Haucap, Pauly and Wey (2001)).

3.4 Conclusion

In this chapter, we showed the development of the minimum wages for the postal industry in Germany from 2007 until 2010 which started in the context of the full postal market liberalization on January 1st, 2008. Those developments also

²⁶ "The Raising Rivals' Costs paradigm requires (1) that the conduct of the challenged firm "unavoidably and significantly" increase the costs of its competitors and (2) that the raising of rivals' costs enables the excluding firm to raise prices above the competitive level" (Krattenmaker and Salop 1986). Cf. also Salop and Scheffman (1983, 1987).

included the foundation of two new employers' associations and a competing union (GNBZ) which additionally created a competition of unions (between Verdi and the GNBZ). We also described the collective wage bargaining system in Germany including its legal basis and the different options to declare a wage contract generally binding, namely the traditional extension rule (AVE) and the Posted Workers Act, which significantly lowered the bar for the introduction of minimum wages.

With the case, we illustrated how minimum wage regulations in combination with extension rulings can be used strategically to hamper competition through raising rivals' costs. As one could expect from the existing literature on raising rivals' costs, existing competitors have been driven out of the market, and new entry likely has been deterred. It can be safely assumed, that investments and the extension of the networks of the new competitors have been reduced or delayed, respectively. Investments and market entry that did not happen, are not observable. Therefore, the actual effects of the strategy might be partly hidden, since "quite often, the theory of the case is not that the defendant has *gained* power over price by raising its rivals' costs, but that it has *defended* its power over prices against the threat of new entry" (Tom and Wells 2003, p. 393).

The contingency rule of the tariff contract, which stated that it should only become valid if it became generally binding, supports the suspicion that the incumbent firm and the established union have strategically agreed upon relatively high wage levels.

The conclusion of the case not only highlights the strategic importance of the establishment of an employer association for the incumbent operator and the agreement on a wage rate with the incumbent union as a prerequisite for the introduction of the minimum wages, but also the strategy of the establishment of a competing employer association and of a competing union as well as the agreement on a competing tariff contract.

Quite obviously, the procedure widely neglected competing firms' (and their employees') interests. The resulting legal disputes over the minimum wage and the status and rights of the newly founded union took over two years and four courts have been concerned with the matters (while the law was set to expire after two years and three months anyhow through a sunset clause).

Hence, before the introduction of such social regulations, not only competitors but also competition authorities should have the right to be heard in order to balance the interests of the existing players in the market and actual and potential entrants to the industry.

Chapter 4

A Model of Raising Rivals' Fixed (Labor) Costs

Motivated by the case of the introduction of minimum wages for the postal industry in Germany as portrayed in the previous chapter, in this chapter we analyze the bargaining problem of an incumbent firm and a union when a collectively agreed upon wage contract becomes the minimum wage in the entire industry. This is a typical case in Germany, where collective wage agreements between a union and an employers' association can be made compulsory even for independent employers through so-called extension rules.¹

In contrast to previous works on raising rivals' (wage) cost strategies we analyze the case where labor costs are mainly fixed operating costs. We consider a market with an incumbent firm and an entrant firm. The employees of the incumbent firm are represented by a union, while none of the workers of the entrant firm is organized. The incumbent firm and the union bargain about a collective wage agreement. We compare two labor market regimes depending on whether or not the agreed upon wage becomes generally binding for all employees in the industry. Our results highlight the raising rivals' cost incentives of both bargaining parties (the incumbent firm and the labor union) when an extension rule is in place. When firms' wage bills constitute fixed costs, then generally binding (minimum) wages become an extremely effective deterrence device such that even a more efficient rival can be deterred from entering the industry.

According to our motivation, our main application is the German postal minimum wage case which nicely highlights the parties' incentives and the consequences of labor laws which make collective agreements generally binding. In

¹German labor market institutions and extension regulations are described in Haucap, Pauly and Wey (2006). Below we identify the key elements of labor laws in Germany which implement industry-specific minimum wages via extension regulations.

Germany, the Posted Workers Act of 1996 allows the Federal Ministry of Labor to implement minimum wages in certain service industries, as e.g., postal services. In contrast to minimum wage legislations in other countries, minimum wages in Germany are based on existing collective contracts which are typically the outcome of negotiations between the established industry union and incumbent firms (organized within an employer association). The Federal Ministry of Labor can then decide to declare such an existing collective contract generally binding. Quite obviously, that procedure tends to neglect new and entrant firms' (and their employees') interests. And even worse, the procedure of declaring collective wage contracts generally binding may be used strategically by the incumbent players to directly harm entrant firms. This is exactly what happens in the Deutsche Post case.

This chapter is related to Williamson (1968) who showed that an incumbent firm may accept high wage rates if this also raises rivals' costs (see also Haucap, Pauly and Wey 2001). Precisely, Williamson analyzed the so-called Pennington case and he argued that an industry-wide wage contract which increases the cost of relative labor-intense firms to a larger extent than the costs of relative capital-intensive firms can be used to force labor intensive firms to withdraw from the market. Quite generally, the raising rivals' cost literature assumes that the strategic variable (as, e.g., a generally binding minimum wage rate) impacts directly on firms' variable costs (Salop and Scheffman 1983, 1987). In those settings a necessary condition for making a raising rivals' cost strategy profitable is that the rival firms' labor productivity (in the case of wage being the strategic variable) is smaller than the firm's labor productivity which executes the anticompetitive practice. As a consequence, overall productive efficiency may very well increase as the more productive firm gains market shares while less productive firms lose market shares.

Our analysis of a setting where labor costs are fixed costs reveals that a raising rivals' costs strategy may also be profitable when rival firms are more efficient. Hence, the adverse effects of labor laws which make wages generally binding are likely to be more pronounced when firms' labor costs are fixed.

We also examine how the presence of wage extension regulations impacts on the entrant firm's incentives to invest into its mail delivery network which determines the entrant's coverage. We show that an entrant may never invest into building up its own delivery network irrespectively of the effectivity of its investment cost function. If investments take place, then an entrant will enter with a network which entails a smaller coverage when compared with the case without

an extension rule. Hence, besides more standard (static) anticompetitive effects, minimum wage legislation unfolds additional adverse dynamic effects on the entrant's willingness to invest into the coverage of its own mail delivery network.

This chapter contributes to the literature which analyzes the interplay between monopolized labor markets and oligopolistic product markets ("unionized oligopolies"). Since Dewatripont (1987, 1988) and Horn and Wolinsky (1988a, 1988b) this literature has been focusing on both the properties of the union-firm bargaining problem and labor market institutions. Accordingly, our model delivers new insights on the nature of union-firm bargaining when labor costs are fixed costs and the effects of labor laws which make wage contracts generally binding.

The chapter is related to the literature on entry barriers (Dixit 1979). Most importantly, we extend the paper by Rogerson (1984) who shows that under symmetric cost conditions a dominant firm has incentives to raise fixed entry cost. In Rogerson (1984) the level of fixed entry costs is exogenously given, while in our analysis the fixed labor costs of operating a mail delivery network are the outcome of negotiations between the union and the incumbent operator.

The chapter is organized as follows. In section 4.1 we introduce the set-up of our model and in Section 4.2 we derive and compare the industry equilibria depending on whether or not an extension regulation is in place. In Section 4.3 we examine how the different labor market regimes affect the entrant's incentives to invest into the coverage of its mail delivery network. Section 4.4 concludes.

4.1 The model

We assume an incumbent firm $i = 1$ and an entrant firm $i = 2$. We think of the firms as postal network operators which offer mail delivery services. The incumbent firm operates a delivery network by employing a fixed volume of mailmen services, $\eta_1 > 0$, which guarantees a certain mail service quality (e.g., maximum delivery transit times). Hence, the incumbent's labor costs of operating its mail delivery network are fixed costs which are independent of the overall mail volume. For a given wage rate w_1 , the incumbent's total labor costs are then given by $\eta_1 w_1$. In addition, the incumbent's (non-labor) marginal costs of mail delivery service are given by $c_1 = c \geq 0$.

With regard to the entrant firm's costs we also assume that labor costs for operating its own delivery network constitute fixed costs with $\eta_2 w_2$.² The entrant

²We focus on competition between delivery network operators. By that we abstract from the issues of access regulation which may counter competitors' incentives to set-up own delivery

has (non-labor) marginal costs of $c_2 = c + \Delta$, where Δ stands for the relative cost efficiency of the entrant firm. The relative cost efficiency of the entrant increases with lower values of Δ . We suppose that the entrant firm's mail delivery network is more efficient when compared with the incumbent firm's delivery technology, so that $\eta_1 \geq \eta_2$ holds (we measure the relative network efficiency of the entrant by the ratio $\eta_2/\eta_1 \leq 1$, where a lower value indicates a higher efficiency level).

We assume a linear inverse demand for mail services $p(X) = a - X$, with $a > c$, where $X := x_1 + x_2$ stands for the sum of mail services offered by the incumbent, x_1 , and the entrant firm, x_2 , respectively. Firms determine their mail service supplies x_i (e.g., through outlets and sorting capacities) which are perceived as homogenous by consumers.³ In the following it is useful to define $\alpha := a - c$.

All workers of the incumbent firm are represented by a union which maximizes the wage bill $L = w_1\eta_1$ of its members. We suppose that all workers in the sector have the same reservation wage $\rho \geq 0$ (which is typically determined by unemployment benefits). We assume collective wage bargaining between the incumbent firm and the union. The union's disagreement point is then given by $\rho\eta_1$. We apply the Nash bargaining solution to solve for the wage settlement (Nash 1950).

Workers of the entrant firm are assumed to be not organized in a union. Hence, in the absence of an extension rule, the entrant is able to hire workers at their reservation wage ρ .

We consider the following two stage game: In the first stage, the incumbent firm and the union bargain about the wage rate. In the second stage, the incumbent and the entrant simultaneously determine their mail volume capacities (i.e., compete à la Cournot).⁴

We distinguish two labor market regimes depending on whether or not an extension rule is in place. If no extension rule exists, then the entrant firm pays the reservation wage to its employees while the incumbent bargains with the union about the wage rate, \hat{w}_1 , which only applies to its own employees. In contrast, if an extension rule is in place, then the entrant firm must pay the (minimum) wage, \bar{w} , which is determined jointly by the union and the incumbent firm.

networks (as, e.g., in the UK where relatively low access prices prevail). See Armstrong (2008) for a model of optimal access prices in postal service markets.

³Because of the linearity of our model we can reinterpret Δ as measuring vertical product differentiation (see Häckner 2000).

⁴We interpret Cournot competition in the sense of Kreps and Scheinkman (1983) such that the postal operators are assumed to set first their mail capacities and then compete in prices. As shown by the authors, that game yields the Cournot outcome if products are homogeneous. In addition, we suppose that both firms' mail delivery networks are sufficiently large to guarantee a certain delivery quality for their supplied mail volumes.

At this point some more general remarks are helpful to specify a meaningful parameter range for our linear model. Let us denote the net revenue of firm i by $R_i = [p(X) - c_i] x_i$ for $i = 1, 2$. Suppose a unique interior Nash-Cournot equilibrium (x_1^*, x_2^*) exists with

$$x_i^* = \arg \max_{x_i} R_i(x_i, x_j^*), \text{ for } i = 1, 2, i \neq j.$$

As products are homogenous, differences in firms' equilibrium quantities only depend on Δ and are independent of the wage rate. Quite generally, in a Cournot duopoly model increasing the relative cost efficiency of one firm leads to a relative increase of the firm's equilibrium output; i.e., $\partial x_1^*/\partial \Delta > 0$ and $\partial x_2^*/\partial \Delta < 0$ holds, with $x_1^* = x_2^*$ at $\Delta = 0$.⁵ We specify that $x_2^*(\Delta) > 0$ and $x_1^*(\Delta) > 0$ holds for all admissible Δ , so that the range of Δ is restricted to an interval which guarantees strictly positive output levels for both firms.

Denote now the optimal net revenue of firm i under duopoly by $R_i^D := [p(x_1^* + x_2^*) - c_i] x_i^*$ (where the superscript "D" stands for the duopoly outcome in the product market). As we assumed constant marginal costs, we obtain $dR_1^D/d\Delta > 0$ and $dR_2^D/d\Delta < 0$, with $R_1^D = R_2^D$ if $\Delta = 0$.

Our approach implies that the wage rate only affects firms' profit levels but not optimal quantity choices. We assume that workers' reservation wage is sufficiently low such that $R_2^D - \eta_2 \rho > 0$ holds. For all admissible Δ , this assumption ensures that the entrant firm always finds it profitable to enter the market whenever it pays the reservation wage to its employees operating the mail delivery network. Similarly, we assume that $R_1^D - \eta_1 \rho > 0$ holds for all admissible Δ , so that the incumbent operates with a strictly positive profit if it pays the reservation wage under duopoly. This assumption also ensures that the joint surplus of the union-incumbent relationship is strictly positive implying, in turn, a negotiated wage strictly larger than workers' reservation wage.

Given that an extension rule exists, the entrant firm must pay the generally binding wage rate, \bar{w} , which is the outcome of bilateral bargaining between the union and the incumbent firm. Clearly, as long as the entrant's net revenue R_2^D is not smaller than its fixed labor costs, $\bar{w} \eta_2$, the entrant will enter the market. We denote the limit wage, where $R_2^D = \bar{w} \eta_2$ holds, by \tilde{w} . Note that $d\tilde{w}/d\Delta < 0$ and $d\tilde{w}/d\eta_2 < 0$ which says that the limit wage decreases as the entrant's cost efficiency or its network efficiency decreases, respectively.

⁵See Vives (1999) for a general treatment of the Cournot oligopoly model and the conditions which ensure "intuitive" comparative statics.

If $\bar{w} \geq \tilde{w}$, then the entrant does not enter the market and the incumbent realizes the monopoly net revenue $R_1^M := R_1(x_1^M)$, with $x_1^M = \arg \max_{x_1} [p(x_1) - c_1] x_1$ (where the superscript ‘‘M’’ stands for the monopoly outcome in the product market). Note that R_1^M is independent of both Δ and \bar{w} . We now invoke the assumption that $R_1^M > \tilde{w}\eta_1 \equiv (\eta_1/\eta_2)R_2^D$ which guarantees the existence of a limit wage \tilde{w} which leaves the incumbent with a strictly positive payoff at the limit wage. This assumption guarantees scope for entry deterrence as, otherwise, the incumbent would always be better off under the duopoly outcome.

Taking these considerations together, we can formulate the following assumption which we maintain throughout the entire analysis.

Assumption 1. *We invoke the following parameter restrictions.*

i) $\Delta \in (-\alpha, \frac{\alpha}{2})$ which ensures that both firms' equilibrium quantities are strictly positive, whenever the entrant firm enters the market.

ii) $\rho < \min \left\{ \frac{R_1^D}{\eta_1}, \frac{R_2^D}{\eta_2} \right\}$ which ensures that both the incumbent and the entrant firm make strictly positive profits if they pay the reservation wage to their employees.

iii) $\frac{\eta_2}{\eta_1} > \frac{R_2^D}{R_1^M}$ which guarantees that the incumbent's profit is strictly positive at the limit wage, \tilde{w} .

Part *iii)* of Assumption 1 mirrors the fact that entry deterrence is in principle possible as the incumbent realizes monopoly net revenues which are larger than the wage bill at the limit wage. This constellation is guaranteed by imposing an upper limit on the relative network efficiency of the entrant. However, the share the incumbent may get from the realized monopoly revenues may be quite small when the limit wage becomes large.

4.2 Equilibrium analysis

We first analyze the equilibrium when no extension rule is in place. Then, we turn to the case where an extension rule makes the wage agreement between the incumbent and the union generally in the entire industry. Finally, we compare the results under both labor market regimes.

Bargaining without extension rule

We first analyze the equilibrium when no extension rule is in place. The profit functions of the incumbent and the entrant are given by

$$\pi_1 = (\alpha - X)x_1 - w_1\eta_1 \text{ and } \pi_2 = (\alpha - \Delta - X)x_2 - w_2\eta_2,$$

respectively, from which we obtain the first-order conditions

$$\alpha - 2x_1 - x_2 = 0 \text{ and } \alpha - \Delta - 2x_2 - x_1 = 0,$$

and hence, the optimal quantities

$$x_1^* = \frac{\alpha + \Delta}{3} \text{ and } x_2^* = \frac{\alpha - 2\Delta}{3}.$$

Hence, $R_1^D = [(\alpha + \Delta)/3]^2$ and $R_2^D = [(\alpha - 2\Delta)/3]^2$. In the absence of an extension rule, the entrant pays the reservation wage ρ to its workers. Hence, the entrant firm's equilibrium profit becomes

$$\widehat{\pi}_2^D = R_2^D - \rho\eta_2. \quad (4.1)$$

We now turn to the first stage of the game, where the union bargains with the incumbent firm about the wage rate w_1 . We apply the Nash bargaining solution which requires that the joint surplus $R_1^D = [(\alpha + \Delta)/3]^2$ is shared equally relative to the union's disagreement point $\rho\eta_1$ (the incumbent's disagreement point is zero). Hence, the equilibrium wage bill, $\widehat{w}_1\eta_1$, must fulfill

$$R_1^D - \widehat{w}_1\eta_1 = \widehat{w}_1\eta_1 - \rho\eta_1. \quad (4.2)$$

The following proposition follows immediately from solving Equation (4.2) for the wage rate, \widehat{w}_1 , the incumbent's profit and the union's wage bill.

Proposition 1. *Suppose that no extension rule exists. Then the entrant firm always enters the market, pays its employees the reservation wage and realizes the profit level $\widehat{\pi}_2^D = R_2^D - \rho\eta_2$. In equilibrium the union and the incumbent settle on the wage rate*

$$\widehat{w}_1 = \frac{1}{2} \frac{1}{\eta_1} [R_1^D + \rho\eta_1]$$

which implies a profit level of

$$\widehat{\pi}_1^D = \frac{1}{2} [R_1^D - \rho\eta_1], \quad (4.3)$$

for the incumbent, while the union's wage bill is

$$\widehat{L} = \frac{1}{2} [R_1^D + \rho\eta_1].$$

By Assumption 1, the entrant firm enters the market with a strictly positive quantity and receives strictly positive profits. Comparing both firms' profit levels (4.1) and (4.3), we observe that the entrant typically realize a higher profit level than the incumbent. To see this, suppose that both firms are equally cost efficient (i.e., $\Delta = 0$). Then comparison of (4.1) and (4.3) yields that $\widehat{\pi}_2^D > \widehat{\pi}_1^D \Leftrightarrow \rho\eta_2 < (1/2)(R_1^D + \rho\eta_1)$, where the latter inequality holds always as we assumed $\eta_1 \geq \eta_2$ and $R_1^D > \rho\eta_1$. The obvious reason for this result is that the incumbent must share its surplus with the union, while the entrant pays its workers' the reservation wage. However, the incumbent's profit can be larger than the entrant's profit if the entrant's cost efficiency is sufficiently small (i.e., Δ positive and sufficiently large).

Bargaining with extension rule

In the case of an extension rule, the outcome of the negotiations between the union and the incumbent firm determines the minimum wage rate, \bar{w} , which is binding for all firms in the industry. With an extension rule in place, firms' optimal strategies in the second stage remain unaffected as long as the entrant firm finds it optimal to enter the market. This is the case as long as $\pi_2 = R_2^D - \bar{w}\eta_2 > 0$ holds. However, if the agreed upon wage rate does not fall short of the limit wage, $\bar{w} \geq \tilde{w}$, then the incumbent sets the monopoly output level, $x_1^M = \alpha/2$, and realizes the monopoly net revenues, $R_1^M = (\alpha/2)^2$, in the product market. Depending on the generally binding wage rate, \bar{w} , the incumbent firm's profit function is then given by

$$\pi_1(\bar{w}) = \begin{cases} R_1^M - \bar{w}\eta_1 = (\alpha/2)^2 - \bar{w}\eta_1 & \text{for } \bar{w} \geq \tilde{w} \\ R_1^D - \bar{w}\eta_1 = [(\alpha + \Delta)/3]^2 - \bar{w}\eta_1 & \text{for } \rho \leq \bar{w} < \tilde{w}. \end{cases}$$

Let us assume for a moment that bargaining only occurs over a certain wage rate. We can then state the corresponding bargaining frontier, $\Lambda(\pi_1)$, which gives the maximum payoff of the union for a given profit level of the incumbent as

$$\Lambda(\pi_1) = \begin{cases} R_1^M - \pi_1 & \text{for } 0 \leq \pi_1 \leq R_1^M - \tilde{w}\eta_1 \\ R_1^D - \pi_1 & \text{for } R_1^M - \tilde{w}\eta_1 < \pi_1 \leq R_1^D - \rho\eta_1. \end{cases} \quad (4.4)$$

We, therefore, obtain a non-convex bargaining problem if

$$R_1^D - \rho\eta_1 > R_1^M - \tilde{w}\eta_1 \quad (4.5)$$

holds. Condition (4.5) requires that the joint surplus under duopoly net of the wage bill at the reservation wage is strictly larger than the joint surplus under monopoly net of the wage bill at the limit wage. In those instances, the incumbent would be able to realize a larger payoff under duopoly than under monopoly if it had all the bargaining power.

If, to the contrary, Condition (4.5) does not hold, then the bargaining frontier is described by $L(\pi_1) = R_1^M - \pi_1$ for $0 \leq \pi_1 \leq R_1^M - \tilde{w}\eta_1$. In that case, we obtain a convex bargaining problem. In the former case, however, we have to use lotteries to “convexify” the bargaining frontier. We do this by allowing for bargaining over a lottery $l = (\tilde{w}, \rho; p, 1 - p)$ which chooses the limit wage, \tilde{w} , with probability $p \in [0, 1]$ and the reservation wage, ρ , with counter probability $1 - p$. We assume that the union and the incumbent are risk-neutral.⁶

Using the lottery l , we can describe the convexified bargaining frontier by

$$L(\pi_1) = \begin{cases} R_1^M - \pi_1 & \text{for } 0 \leq \pi_1 \leq R_1^M - \tilde{w}\eta_1 \\ [p\tilde{w} + (1 - p)\rho]\eta_1 & \text{for } R_1^M - \tilde{w}\eta_1 < \pi_1 \leq R_1^D - \rho\eta_1, \end{cases} \quad (4.6)$$

where the lottery fulfills

$$[p\tilde{w} + (1 - p)\rho]\eta_1 = \tilde{w}\eta_1 - \frac{\tilde{w}\eta_1 - \rho\eta_1}{(R_1^D - \rho\eta_1) - (R_1^M - \eta_1\tilde{w})} \cdot [\pi_1 - (R_1^M - \eta_1\tilde{w})].$$

⁶By allowing for bargaining over lotteries and assuming von Neumann-Morgenstern expected utilities, our model fulfills the axioms of the Nash bargaining solution in expected terms. One may question whether bargaining over lotteries and the requirement to implement the ex post outcome of the lottery is a convincing image of real world wage bargaining. However, bargaining solutions which abstain from using lotteries are also problematic. For instance, Conley and Wilkie (1996) propose an extended Nash bargaining solution for nonconvex but comprehensible bargaining problems. Their approach is not applicable to our problem as the smallest comprehensible set of the bargaining frontier (4.4) has a jump at the limit wage \tilde{w} . Moreover, Conley and Wilkie’s proposed solution is not necessarily strictly Pareto-efficient (see Hougaard and Tvede 2010, for a solution which requires strict Pareto-efficiency but lacks a noncooperative implementation).

Applying the Nash bargaining solution to the convexified bargaining frontier (4.6) and noting the union's disagreement payoff, $\rho\eta_1$, we obtain the following proposition which summarizes the bargaining outcome under an extension rule.

Proposition 2. *Suppose that an extension rule exists. If $R_1^D - \rho\eta_1 \leq R_1^M - \tilde{w}\eta_1$, then entry is deterred for sure and the Nash bargaining solution yields the generally binding wage rate*

$$\bar{w} = \begin{cases} \frac{1}{2} \frac{1}{\eta_1} (R_1^M + \rho\eta_1) & \text{for } R_1^M - \tilde{w}\eta_1 \geq \tilde{w}\eta_1 - \rho\eta_1 \\ \tilde{w} & \text{for } R_1^M - \tilde{w}\eta_1 \leq \tilde{w}\eta_1 - \rho\eta_1. \end{cases}$$

If $R_1^D - \rho\eta_1 > R_1^M - \tilde{w}\eta_1$, then the (expected) wage rate is given by

$$\bar{w} = \begin{cases} \frac{1}{2} \frac{1}{\eta_1} (R_1^M + \rho\eta_1) & \text{for } R_1^M - \tilde{w}\eta_1 \geq \tilde{w}\eta_1 - \rho\eta_1 \\ [p^*\tilde{w} + (1-p^*)\rho] & \text{for } R_1^M - \tilde{w}\eta_1 \leq \tilde{w}\eta_1 - \rho\eta_1, \end{cases}$$

with $p^* = \left[1 + \frac{(\tilde{w}\eta_1 - \rho\eta_1) - (R_1^M - \tilde{w}\eta_1)}{R_1^D - \rho\eta_1}\right]^{-1}$, so that entry is deterred for sure or with probability p^* .

The first part of Proposition 2 follows directly from applying the split-the-surplus rule and taking notice of the corner solution. The second part of Proposition 2 follows from applying the split-the-surplus rule to the convexified problem. In particular, whenever the Nash solution requires to use a lottery, then the lottery must guarantee that the expected net joint surplus is shared equally which gives the condition

$$[p^*\tilde{w} + (1-p^*)\rho]\eta_1 - \rho\eta_1 = p^*(R_1^M - \tilde{w}\eta_1) + (1-p^*)(R_1^D - \rho\eta_1), \quad (4.7)$$

from which we obtain p^* as stated in Proposition 2.

We are now in a position to analyze how the parameters of our model affect the likelihood of a monopoly outcome where the union and the incumbent agree on a minimum wage which deters entry. From Proposition 1 we observe that deterrence for sure depends on the condition $R_1^M - \tilde{w}\eta_1 > \tilde{w}\eta_1 - \rho\eta_1$ being fulfilled. We can rewrite that condition as follows

$$f := (\tilde{w}\eta_1 - \rho\eta_1) - R_1^M + \tilde{w}\eta_1 = \frac{2\eta_1}{\eta_2} \left(\frac{\alpha - 2\Delta}{3}\right)^2 - \rho\eta_1 - \left(\frac{\alpha}{2}\right)^2 < 0.$$

Differentiation of $f(\cdot)$ gives $\partial f/\partial\eta_1 > 0$, $\partial f/\partial\eta_2 < 0$ and $\partial f/\partial\Delta < 0$.

We can also examine the probability p^* of entry deterrence which we can rewrite as $p^* = (1 + f/g)^{-1}$ with

$$g := R_1^D - \rho\eta_1 = \left(\frac{\alpha + \Delta}{3}\right)^2 - \rho\eta_1.$$

Differentiation of $g(\cdot)$ yields $\partial g/\partial\Delta > 0$ and $\partial g/\partial\eta_1 < 0$. It is now straightforward to establish the following corollary.

Corollary 1. *Deterrence of the entrant for sure becomes more likely and the probability of a limit wage, p^* , increases, whenever the cost efficiency or the network efficiency of the entrant decreases (i.e., Δ or η_2 increases, resp.) or the network efficiency of the incumbent increases (i.e., η_1 decreases).*

Clearly, a bargaining outcome with $\bar{w} \geq \tilde{w}$ becomes more likely for higher values of the entrant's marginal costs (Δ) and larger (lower) values of the network efficiency parameter η_2 (η_1). Inspection of the probability p^* which solves the split-the-surplus condition (4.7) in expected terms, shows that p^* (i.e., the probability of choosing \tilde{w}) increases as well when entry deterrence for sure becomes more likely. Interestingly, an increasing value of Δ and a decreasing value of η_1 which both shift the extremum point $R_1^D - \rho\eta_1$ of the bargaining set outward, induce the bargaining parties to settle on a higher probability of choosing \tilde{w} under the lottery solution. Hence, efforts of the entrant to enhance its cost efficiency would result in a lower probability of entry (we come back to a similar phenomenon below in Section 4, where we study the entrant's incentives to invest into the coverage of its mail delivery network).

We now ask whether entry deterrence can occur for sure even when the entrant is more efficient. Let us assume for a moment that both firms have the same network efficiency (i.e., $\eta_1 = \eta_2$). To simplify, let us also assume that workers' reservation wage takes the value of zero. Entry deterrence then occurs for sure if

$$2\left(\frac{\alpha - 2\Delta}{3}\right)^2 - \left(\frac{\alpha}{2}\right)^2 \leq 0 \text{ or } \Delta \geq \frac{\alpha(2 - 3/\sqrt{2})}{4} < 0.$$

Hence, for all $\Delta \in [\alpha(2 - 3/\sqrt{2})/4, 0)$ wage bargaining under an extension rule induces deterrence of a more cost efficient rival.

Let us next assume that both firms have the same cost efficiency (i.e., $\Delta = 0$) but may differ in their network efficiencies (η_1, η_2). Again, setting the reservation wage to zero, we then obtain the following condition for entry deterrence for sure:

$$\frac{2\eta_1}{\eta_2} \left(\frac{\alpha}{3}\right)^2 - \left(\frac{\alpha}{2}\right)^2 \leq 0 \text{ or } \frac{\eta_2}{\eta_1} \geq \frac{8}{9}.$$

Hence, with an extension rule existing, an incumbent can deter a rival operator with a more efficient delivery network if $\eta_2/\eta_1 \in (8/9, 1]$ holds. We summarize those results in the following corollary.

Corollary 2. *Suppose $\rho = 0$. If $\eta_2/\eta_1 = 1$, then a more cost efficient entrant is deterred from entry for sure for all $\Delta \in [\alpha(2 - 3/\sqrt{2})/4, 0)$. If $\Delta = 0$, then an entrant with a more efficient network is deterred from entry for sure for all $\eta_2/\eta_1 \in (8/9, 1]$. Moreover, when the bargaining parties use a lottery to share their expected joint surplus, then deterrence of a more efficient entrant always occurs with some strictly positive probability.*

Comparison of labor market regimes

Comparing the wage rate agreed upon when no extension rule is in place with the case where an extension rule obliges the entrant to pay the minimum wage, we arrive at the following result.

Corollary 3. *The (expected) wage rate under a regime with an extension rule is strictly larger when compared with a regime where no such rule exists. Moreover, the union's (expected) wage bill and the incumbent's (expected) profit are both strictly larger under an extension rule.*

Corollary 3 shows that the usually assumed conflict of interest between a firm and its union in wage bargaining may be absent in the presence of market entry, whenever the wage rate can be used to raise rivals' costs. In contrast to deterrence models where the deterrence instrument (as, e.g., sunk costs in Dewatripont 1987) differs from the rent-sharing instrument, a minimum wage which combines both functions in a single instrument partly eliminates the supposed conflict. The reason for this result is that the firm may want to deter entry through a relatively large minimum wage which is also in the interest of the union. However, the conflict of interest does not disappear completely as the firm tries to pocket as much as possible from the monopoly rents.

We conclude the analysis of our model with some remarks on overall productive efficiency as measured by mail unit costs. We compare the labor market

regime without an extension rule with the labor market regime with an extension rule. We focus on the case that entry is deterred for sure if an extension is in place. Unit mail cost when no extension rule is in place is given by

$$\frac{cx_1^* + (c + \Delta)x_2^* + \eta_1\widehat{w}_1 + \eta_2\rho}{x_1^* + x_2^*}. \quad (4.8)$$

If an extension rule exists, unit mail costs are equal to

$$\frac{cx_1^M + \eta_1\bar{w}}{x_1^M}. \quad (4.9)$$

Inspection of both expressions (4.8) and (4.9) reveals the basic trade-off of an extension rule in terms of unit mail costs. As is well-known duplication of fixed costs under duopoly tends to make a monopoly outcome more attractive. However, a monopoly outcome under an extension rule has three main drawbacks: first, it reduces total mail volume ($x_1^* + x_2^* > x_1^M$), second, it increases wage demands by the union of the incumbent firm ($\bar{w} > \widehat{w}_1 > \rho$), and third, it may deter a more efficient rival from entering the market. Taking those effects together a duopoly outcome might be very well more desirable, even in an industry exhibiting features of a natural monopoly.

To show that overall mail unit cost can be smaller under duopoly in the absence of an extension rule, let us shortly analyze the case of $\Delta = 0$, so that $x_1^* = x_2^*$. Using expressions (4.8) and (4.9) we obtain the condition

$$\rho \left(\eta_2 - \frac{1}{6}\eta_1 \right) < \frac{\alpha^2}{9}$$

which assures that mail unit costs are smaller under duopoly when compared with a labor market in which an extension rule allows the union and the incumbent to settle on an entry deterring minimum wage. Clearly, such an outcome is more likely the higher the relative network efficiency of the entrant.

4.3 Endogenous coverage

Until now we assumed that both firms compete head-to-head in the mail delivery market. Both firms were supposed to provide full coverage and the efficiency levels of their delivery networks were given exogenously. In reality, however, the decision about the coverage of a firm's delivery network should be endogenous (see Valletti et al. 2002). Because of universal service regulation the incumbent

may not have the choice to reduce its coverage below full coverage. Accordingly, we suppose that the incumbent must provide a full coverage delivery network. We assume that the entrant firm, however, can decide freely about the coverage of its delivery network.

We abstract from any efficiency differences between both firms. We assume $\Delta = 0$ and we suppose that the fixed costs of running the mail delivery network are a linear function of each firm's coverage, $s_i \in [0, 1]$. The incumbent is assumed to have full coverage with $\eta_1 = \eta$, while the entrant can choose its coverage level, so that $\eta_2 = \eta s_2$.

We assume that the mail demand schedule $X = a - p$ is the aggregate of a continuum of symmetric delivery markets with total mass of one. Suppose now that the entrant serves the fraction s_2 of all markets. Then the fraction s_2 of all delivery markets are served by both the entrant and the incumbent, while the remaining fraction $1 - s_2$ is only served by the incumbent. For expositional purposes, we suppose that the incumbent can discriminate between the duopolistic delivery markets and the markets where it holds a monopoly position.

Given the entrant enters the market in the final stage of the game with a coverage of s_2 , the inverse demand in the duopoly delivery markets is given by $p^D = a - (1/s_2)(x_1 + x_2)$. Accordingly, the inverse demand in the monopoly segment is given by $p^M = a - [1/(1 - s_2)]y_1$, where x_i ($i = 1, 2$) denotes the firms' mail volume levels in the duopoly segment and y_1 stands for the incumbent's mail volume in the monopolistic segment.

Solving for the optimal quantities in the duopoly segment we obtain $x_1^* = x_2^* = s_2(\alpha/3)$ which gives rise to net revenues of $s_2 R^D$ for each firm. Accordingly, we obtain for the monopoly segment the optimal output level $y_1^M = (1 - s_2)(\alpha/2)$ which leads to net revenues of $(1 - s_2)R_1^M$ for the incumbent firm.

We suppose that the entrant firm must incur sunk costs to build up a delivery network in an initial stage before the above analyzed two-stage game starts. We specify that the costs to build up a delivery network with coverage s_2 are given by the investment function $K(s_2) = s_2^\epsilon$ with $\epsilon > 1$. Note that $1/\epsilon$ measures the (constant) cost elasticity of coverage. Hence, a one percentage increase of investment cost leads to a percentage increase of coverage below one percent.

We are now in a position to fully analyze a three-stage game, where the entrant chooses its coverage in the initial stage while the next two stages remain the same as before.

We first analyze the case without an extension rule. In this case, the entrant firm solves the problem

$$\max_{s_2 \in [0,1]} s_2(R^D - \rho\eta) - s_2^\epsilon$$

from which we obtain the subgame perfect coverage decision of the entrant firm given by

$$s_2^* = \begin{cases} \left[\frac{1}{\epsilon} (R^D - \rho\eta)\right]^{\frac{1}{\epsilon-1}} & \text{if } \epsilon > R^D - \rho\eta \\ 1 & \text{if } \epsilon \leq R^D - \rho\eta. \end{cases} \quad (4.10)$$

Clearly, a full coverage outcome becomes more likely, the larger the marginal rents of investment, $R^D - \rho\eta$, and the larger the cost elasticity of coverage, $1/\epsilon$.

We next turn to the case when an extension rule makes the wage contract between the incumbent and the union generally binding. We first observe that the limit wage is independent of the entrant's coverage decision. As investments into the build-up of the delivery network constitute sunk costs, the limit wage fulfills $s_2 R^D - \eta s_2 \tilde{w} = 0$ which holds for all $s_2 > 0$ if and only if $\tilde{w} = (1/\eta)R^D$. A sufficient condition for an entry deterrence outcome is (see Proposition 2)

$$R_1^M - \tilde{w}\eta \geq s_2 R^D + (1 - s_2)R_1^M - \rho\eta. \quad (4.11)$$

In those instances, the incumbent could realize a larger surplus under an entry deterring wage than under the duopoly outcome at the workers' reservation wage if it had all the bargaining power. Such an outcome becomes the more likely the larger the entrant's coverage becomes as the right-hand side of (4.11) is monotonically decreasing in s_2 . The condition is, however, never binding, whenever

$$\rho\eta < 2R^D - R_1^M \quad (4.12)$$

holds. Incidentally, if Condition (4.12) holds, then the Nash bargaining solution always requires to use a lottery to resolve the negotiations between the incumbent and the union.⁷ We, therefore, obtained the following lemma.

Lemma 1. *If $\rho\eta \geq 2R^D - R_1^M$, then entry is deterred for sure and the entrant does not invest into building up a mail delivery network. If, to the contrary, $\rho\eta < 2R^D - R_1^M$ holds, then entry is deterred with probability p^* for all $s_2 \in [0, 1]$.*

⁷By Proposition 2, we know that the Nash bargaining solution chooses a point on the convexified part of the bargaining frontier if $R_1^M - \tilde{w}\eta < \tilde{w}\eta - \rho\eta$ which is equivalent to $\rho\eta < 2R^D - R_1^M$. Hence, if $\rho\eta < 2R^D - R_1^M$, then Condition (4.11) is never fulfilled for all $s_2 > 0$.

Lemma 1 highlights the power of minimum wages as a deterrence instrument. Given that workers' reservation wage, ρ , and/or the labor-intensity of operating the mail delivery network, η , is relatively high, then an entrant firm will never build up a delivery network if an extension rule is enforced. Comparison with the entrant's optimal coverage decision in the absence of an extension rule (4.10) shows that there can exist instances in which the entrant would have otherwise build up a full coverage delivery network.

By Lemma 1, the entrant only invests into a delivery network if Condition (4.12) holds which implies that the incumbent and the union revert to a lottery to resolve their wage negotiations.

The entrant's maximization problem then becomes

$$\max_{s_2 \in [0,1]} (1 - p^*) [s_2(R^D - \rho\eta)] - s_2^\epsilon, \text{ with } p^* = \left[1 + \frac{(\tilde{w}\eta - \rho\eta) - (R_1^M - \tilde{w}\eta)}{s_2 R^D - \rho\eta} \right]^{-1}. \quad (4.13)$$

Note that $\partial p^*/\partial s_2 > 0$, so that the probability of an entry deterring wage increases in the entrant's coverage. Differentiation of the entrant's profit function (4.13) with respect to s_2 yields the first-order condition for an interior solution

$$\left(1 - p^* - s_2 \frac{\partial p^*}{\partial s_2} \right) (R^D - \rho\eta) = \epsilon s_2^{\epsilon-1}, \quad (4.14)$$

where the left-hand side is the marginal rent of investment. The left-hand side of Condition (4.14) is clearly smaller than the marginal rent of investment in the absence of an extension regulation (which is equal to $R^D - \eta\rho$). Two reasons are responsible for this result: first, successful entry only occurs with some probability $1 - p^* < 1$, and second, the bargaining parties react to an increase of the entrant's coverage by increasing the probability of an entry deterring wage (i.e., $\partial p^*/\partial s_2 > 0$).

Denote the solution to the maximization problem (4.13) by s_2^{**} and let us focus on interior solutions, s_2^* , when no extension rules exists. The following proposition is then immediate.

Proposition 3. *If $\rho\eta \geq 2R^D - R_1^M$, then the entrant does not invest into building up a delivery network under an extension rule. If, to the contrary, $\rho\eta < 2R^D - R_1^M$ holds, then the entrant invests strictly less under an extension rule when compared with the investment level s_2^* for $\epsilon > R^D - \rho\eta$ in the absence of an extension rule; i.e., $s_2^{**} < s_2^*$.*

Proposition 3 makes clear that for a large enough reservation wage bill, $\rho\eta$, an entrant will never invest into building up its own delivery network irrespectively of its investment cost function $K(s_2)$. Moreover, if investments take place, then the entrant will enter with a network which entails a smaller coverage when compared with the case without an extension rule. Overall, having analyzed a richer model with endogenous coverage we are left with the observation that minimum wage legislation unfolds additional adverse dynamics effects on the entrant's willingness to invest into the coverage of its own mail delivery network.

In the next sections we relate our analysis to recent minimum wage legislation in Germany. We first describe the relevant labor laws which implement minimum wages at the industry-level. We then examine the Deutsche Post case which highlights the raising rivals' cost incentives when labor laws exist which make the collective wage agreement between incumbents generally binding. Our investigation of that case shows that the main predictions of our model mirror nicely what actually happened in reality.

4.4 Conclusion

Following from the observations decribed in the previous chapter, in this chapter we analyzed theoretically how minimum wage legislation in the form of extension rulings can be used by collective bargaining partners to deter entry or to drive existing competitors out of the market. Our main application is the postal service industry where the labor costs of running a mail delivery network are mainly fixed operating costs.

Both, the Deutsche Post case discussed in detail in chapter 3 and our model reveal the strong incentives of the incumbent firm and the established union (which cares only about its organized members employed by the incumbent) to settle (strategically) on a relative high wage rate so as to harm competitors. The strategic intention becomes obvious when one considers the fact that the tariff contract specifying the proposed minimum wages was made contingent on being declared generally binding by the Federal Government. As we have shown, both parties retained the right to terminate the agreement otherwise.

As it is the case in more standard raising rivals' costs models where wages affect a firm's marginal labor costs directly, wage increases can be used to monopolize the final product market. However, there are several differences between raising rivals' marginal costs and raising rivals' fixed labor costs. Most importantly, when labor constitutes fixed costs, then the profitability of a raising

rivals' costs strategy does not depend on a sufficient efficiency advantage of the incumbent firm (which engages in the anticompetitive practice) vis-à-vis potential competitors.

This observation has several implications. *First*, the alleged conflict of interest between the firm and its union becomes less pronounced as it is the case when wages are variable costs. When wages are variable costs a wage increase not only distributes rents to the union but also tends to reduce the overall joint surplus available because of the well-known double mark-up problem. *Second*, when wages are fixed costs then an incumbent is able to deter entry through strategic wage increases even if the entrant firm is more efficient. As a consequence, overall productive efficiency can be reduced under a raising rivals' fixed labor cost strategy.

Furthermore, the model predicted the effects of the introduction of a high minimum wage for the postal industry in Germany, that the cost increase was disastrous for the competitors, where not a marginal reduction in output was the consequence, but also firms were squeezed out of the market entirely, for example when PIN had to file insolvency, although the subsequent legal dispute of minimum wage declaration was successful in the sense that it has been declared void.

We also showed that extension regulations may have adverse effects on competitors' willingness to invest into the coverage of their mail delivery networks. In the extreme case, entry is completely deterred under an extension rule while an entrant may build a mail network with full coverage when no such extension regulation exists.

Therefore, especially minimum wages proposed by established industry players in industries where wage costs are mainly fixed costs should be treated with special care, since *i)* unduly high minimum wages are a particularly effective deterrence instrument when labor constitutes fixed costs, *ii)* drastic effects on competitors rather than "marginal" effects might result, *iii)* the conflict of interest between a union and a firm vanishes when the limit wage is relatively low, *iv)* even more efficient rivals can be deterred and *v)* overall productive efficiency may decline.

In the previous chapter, we also described recent legal disputes which resulted from the Federal Government's minimum wage ruling. The most notable issue which arises as an insight from this chapter has become the fact that the incumbent unions (namely, the unions organized in the DGB) lost their monopoly position in the "market for collective contracts." This is a rather new development

in the German labor market, and the labor institutions (which were designed for bilateral wage negotiations between a monopoly union and a monopolistic employer association at the industry-level) are still struggling to come to terms with a competitive labor market.

Chapter 5

Modernizing the Postal Universal Service

“The two ideas of reducing the postal service obligation and increasing the electronic service obligation through broadband are complementary.”¹

Although this quotation reflects only a small part of the current issues around postal regulation, it points directly to the postal industry’s challenge how to manage the universal service in times of increasing electronic substitution and to the idea of considering the interrelation between the postal and the telecommunications industry.

Increasingly, Europe’s postal operators seem to fight an uphill battle against declining demand for physical mail. In a very difficult overall economic situation, they face the challenge to master increasing direct competition from market entrants, indirect competition from electronic communication alternatives, and rapidly changing senders’ and receivers’ needs and expectations.

Despite the fact, that the posts are responding through increased efficiencies and cost-cutting initiatives as well as adopting strategies to support longer-term growth, in particular the universal service obligation (USO), the obligation to provide easily accessible, affordable basic services (with a certain minimum quality) for the whole population, appears to be controversially discussed. In many countries, the viability of the universal service in its contemporary form seems to be questionable and reductions of the service quality and/or additional funding to be unavoidable if the postal operators do not find additional revenue streams that compensate for the burden of providing these services especially in high-cost/low-margin areas.

¹E. Toime (2009).

Therefore, it appears to be appropriate to examine the USO in its current form, especially with regard to the high dynamics of the wider communications market, because the current situation provides also huge opportunities for postal companies, if the regulation is developed further in order to account for the new realities. Such an integrated approach should allow the operators flexibility on their path to their future role in the information society and should also be in line with the Europe 2020 strategy. This public strategy prioritizes “smart” and “sustainable growth” and aims to “exploit potential” that currently hinders addressing the “exposed fundamental issues and unsustainable trends that we cannot ignore any longer”, insufficient use of information and communication technologies and encourages the review of regulations to support the transition of service sectors (EU 2010a).

Overall, this chapter aims to contribute to the discussion concerning appropriate regulation with the aim to provide an option that facilitates the transition towards an efficient and sustainable universal service obligation and therefore to contribute to fastening the economic recovery after the current downturn. Starting from the hypothesis that the current USO setting can be improved to the benefit of all stakeholders, the incumbent operators, competitors and customers, we discuss and assess alternative settings based on the relevant literature on the USO and on convergence. We show, that taking the developments of the digital information society into account, rethinking the universal service should be on the agenda of policymakers already.

5.1 The digital edge

During the last 25 years, the rapid advancements in information and communication technologies (ICT) led to far-reaching implications not only for the industries involved but also transformed the whole society. Prices have declined rapidly while variety and quality of ICT have been increased rapidly, with mobile and broadband technologies creating new consumer and business demands, and influencing the way citizens, businesses and governments interact if not creating entirely new social structures. Countries and governments are strategically pushing forward their digital communications sector because they expect to gain substantial and long-lasting competitive advantages.

New products emerge every day, and some, such as YouTube and Facebook, are becoming fixed features on our cultural environment. ICT reach has extended from international, national and local networks to include networks for businesses,

homes, cars, and individuals. And the internet has gone mobile, as devices on cellular networks have been internet-enabled and are already used by more than a billion of individuals around the world (ITU-D IDS database, values 2011 eoy). Overall, a vast array of applications for commerce, government, education, health, and entertainment emerged.

These developments further change consumer and business behaviors and expectations towards communication and communications technologies, including letters mail. While innovation *around* the postal sector focused new services and infrastructures which led to inter-modal competition, substitution, and mail mix changes, innovation *within* the postal sector for a long time focused mainly improving the efficiency of the sorting, transport and delivery processes. However, since broadband take-up and mobile penetration have reached critical masses, a majority of the pilot projects of postal operators involves ICT to extend the scope of their services or to introduce entirely new ones.

5.1.1 Consumer trends: New needs and expectations

Due to generally higher mobility and due to the characteristics of the new communication technologies, electronic postal innovation enhancing speed, efficiency and convenience for the customer became center-stage, being hybrid mail a reference example.² Moreover, people and businesses have many ways to communicate and now take media choice for granted. Although traditional mail is a proven and efficient means of communication, yet there is no doubt that faster, cheaper channels will continue to challenge it (Lesur 2007, p. 3). This challenge is reinforced by the developments of e-services not only from private companies but also in the area of e-government services (Capgemini et al. 2009).

Although consumers want to have the flexibility and convenience associated with mobility, a large majority of two thirds and above often still prefers to receive mail and paper documents, especially concerning financial documents like invoices and account statements but also product announcements (with e-mail being preferred secondly, followed by direct internet access, short messages (SMS) being least liked, cf. Szeto and Jimenez 2005). Thereby, postal operators are situated at the boundary between the digital and the physical world, providing ample opportunities for unified messaging and media preference services (Lesur 2008, p. 48). In consequence, “what we are seeing now is that images of envelopes

²*Hybrid mail* is sent electronically by the sender, then printed, enveloped and stamped outside of the sender’s premises, and finally delivered physically. *Reverse hybrid mail* is the electronic delivery/receipt of physical mail after having been scanned.

and packages can be delivered electronically, allowing the receiver to decide what, when and how a mail item is to be treated.” (Toime 2009, p. 12).

With many different information transmission channels available, individuals have to manage this new complexity and handle all their financial (banking, online and tax payment), communication (traditional phone, mobile phone, internet provider), and delivery services (post office, home delivery of goods). Electronic access to these services through computers and mobile phones certainly eases the task to integrate many transactions remotely and in a convenient fashion. Accordingly, some postal operators started to extend their service portfolio “in a move that harkens back to the unified services that characterized organizations like the Post, Telegraph and Telecommunication” not only with banking, but also with consumer phone and broadband services with the aim to become daily-life services integrators by combining the physical and the electronic world in a trusted, secured environment for their consumers (Lesur 2007, pp.9-10).

Not only from the developments in the area of ICT, but also from the full market opening to competition as envied by the EU legislation, consumers furthermore expect prices to fall without sacrificing the reliability, confidentiality, or security of transmission, therefore increasing customer orientation (Ecorys 2008b, pp. 17, 27).

5.1.2 Availability, take-up and effective use of ICTs

Key for effective use of ICT is to reach the critical mass needed and to integrate it with existing systems. In order to make the technology available to consumers, first, a new technology or application has to be marketed, where innovation, economies of scale, pricing, and trust are important aspects, the introduction of mobile phones providing an excellent example for this. Second, technological developments have to ensure, that the convergence or integration of different platforms becomes possible; for example, a smart phone combining a mobile phone with advanced capabilities concerning the network access speed and a functionality similar to personal (desktop) computers.

Over the last years, fixed as well as wireless networks followed this pattern with new applications and services being introduced to the markets with declining prices and extending their geographic coverage. Even when a specific technology has been promoted to be universally accessible, the higher-end services associated with the technology (e.g., higher bandwidth) took time to reach the more remote areas of a country. Sweden, Finland and Australia, for example, hope to provide fiber-optic networks for 90 % or more of their countries’ populations only within

the next ten years. Other technologies such as mobile broadband (4G/LTE) or WiMax networks take time to reach every corner of the country as well but their implementation is expected to be only a matter of time due to the high political priority assigned to it.

Nevertheless, even with many technologies being only partially available throughout Europe yet, the share of the population using the internet on a regular basis often exceeds two thirds of a countries population with a share around or above 90 % in the Nordic countries such as Sweden, Norway or Iceland already. Furthermore, not only due to improvements in the availability of technology but also due to usage changes of the younger generations, internet usage can be expected to reach nearly the full population with the next one or two decades which can be seen from the share above 95 % in the group of young Europeans between 15 and 30 years of age even today (cf., e.g., Eurostat EPP statistics database).

The importance of ICTs is also reflected by the consumer expenditures where ICTs constitute a large part in the everyday life of many OECD consumers (cf. figure 5.1). Although ICT-related expenditures represent a small percentage of the household budget (2.2 % in 2007), this part of the household budget has grown steadily over the last two decades. Concerning the figures, additionally it has to be noted, that the *monthly* expenditures on telecommunications services per private household in all European countries exceed the *yearly* expenditures for postal services.

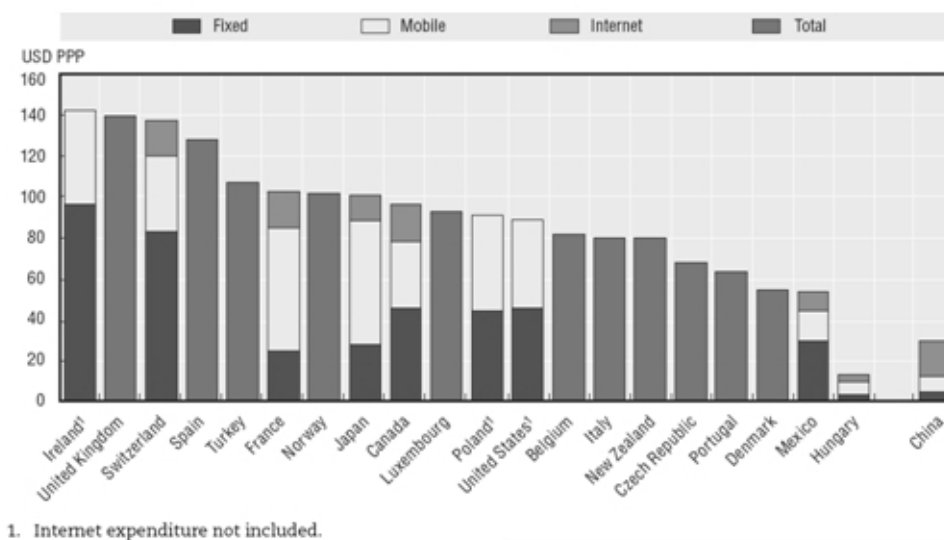
In conclusion, although for a complete switch to digital services issues concerning the security and trustworthiness of network infrastructures and services have to be solved, one can expect the development towards people being “always on”, with smart devices, virtual smart agents and easy-to-use appliances and applications automatically assisting the users in their daily activities, filtering information and serving as personal coaches in the near future (DPAG 2009).

5.1.3 The impact on postal services and operators

*“Intermodal competition from electronic media presents a serious threat to the viability of postal operators as mail volumes decline. It really is the elephant in the room when it comes to threats to the traditional postal business.”*⁴

³The figure shows the harmonized indices of consumer prices for the EU25. While the general indices for all items have increased by 19 % in the last eight years, the indices for communication have declined by 16.4 %.

⁴Crew and Kleindorfer (2010), p. 11.

Figure 5.1: Monthly household expenditures on ICT³

(Source: OECD 2009, p. 35, StatLink: <http://dx.doi.org/10.1787/618836018205>)

The national postal operators (NPOs) around the world often attribute the decreases in their own mail volume growth to electronic substitution and consider e-substitution and competition with other forms of electronic business communications as a threat to their core service, or at least to their operating margins. Nader and Jimenez (2005, pp. 6-7) provide an overview over different substitution patterns.

However, the actual effects of e-substitution of postal services are difficult to estimate due to their dependence on the type of mail, market developments, and senders' and receivers' preferences (cf. Diakova 2005, Nader and Jimenez 2005, Nader and Lintell 2008, Nikali 2010, Veruete-McKay et al. 2010). In addition, postal researchers and strategists have found these terms refer to a host of factors in addition to substitution, including *i*) cutbacks in business-originated mail volumes due to economic pressures on mailers, *ii*) market share shifts due to emerging competition from market liberalization, and *iii*) product substitution (e.g., to a lower-priced mail class, Nader and Lintell 2008, p. 1).

Although forecasts have proven to be unreliable, the precipitous decline of total mail volume due to electronic alternatives that has been predicted for more than a decade and continues to be forecasted for the years to come has not happened. Some analysts are now suggesting the stagnant growth rates of addressed letters, delivered by national postal operators, could signal a “tipping or inflec-

tion point” and that, from this point forward, volumes will begin to decline. The clearest trend is a decline in First-Class single piece addressed letters in a number of countries (Nader and Lintell 2008, p. 3). In addition, it is widely expected, that the volumes will not recover, maybe in the area of promotional mail, but not in transactional mail such as account statements, invoices and so on.

These views seem to be supported by empirical research about the drivers of mail, and mail substitution. Diakova (2005) and Nader and Lintell (2008) find that:

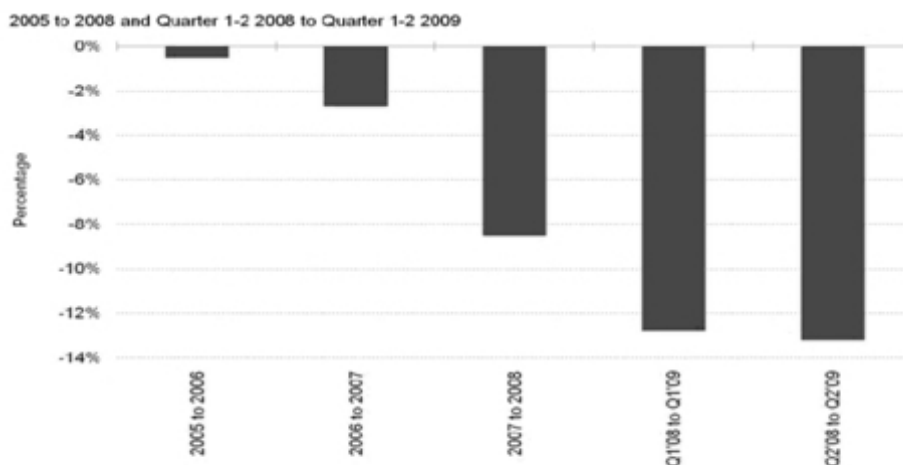
1. Economic growth no longer is a determinant for mail volumes as strong as in the past in the developed countries while the relationship in developing and transition countries is still strong.
2. The effects of population dynamics and income distribution complicate the analysis due to the resulting demand effects.
3. The share of mail sent by businesses continues to grow, thus clearly assigning the role of senders to businesses (with the share mail sent by private and small business mailers being below 15 %, in some countries even close to 5 % as, e.g., in Sweden; and more than half of the total volume being generated by the largest 3000 mailers in most countries), while private households stay important receivers of mail (with the share of mail received by private households and small businesses above two thirds).⁵

Furthermore, it seems safe to assume, that the steep volume declines during and since the economic downturn in the last years will be recovered only partially. The decreases in several countries reached double-digit numbers, with Latvia being an extreme case where mail volumes dropped by 33 % in two years. Figure 5.2 illustrates the average development for the largest postal operators worldwide.

Overall, letter post becomes less a medium for exchanging correspondence, more for delivering advertisements (more “one-way broadcast”, less “two-way communication”), and traditional operators become more dependent on large mailers (WIK 2005, p.170). Due to the related shifts in mail volumes and the mail mix, consumer-sent mail loses importance and the needs of the customers reflect a shift away from the relatively fast transactional mail delivered in E+1 to low priced products with a lower service quality level in terms of delivery speed (Capgemini 2007, p.8). Therefore, to date large mailers have been the

⁵Household-to-household mail already in 1987 was only about 5 % of the total volume; cf. WIK (2005, p. 110).

Figure 5.2: Monthly household expenditure on postal services trend



Source: Deloitte Presentation – The Postal Industry 2009, based on IPC data.

primary (direct) beneficiaries of the development of competition on the postal markets, with improved quality of service, lower prices, and innovation, while consumers and small businesses have seen limited change or improvement (Accenture 2008, p. 7). In addition, the upcoming competitors are concentrating on the most profitable senders and regions, which is expected to lead to a reduction of the share of first class mail from 47% in 2007 to 10-15% until the year 2015, while the share of the mail that is not time-critical increases from 50 to over 85%. Taken together, these developments in turn are estimated to decrease the average prices by 20%, leading to further pressure for quick response by the postal industry (Capgemini 2007).

Given these facts and observations, the established postal operators have to react to this rapidly developing environment through the *i)* optimization of their delivery network according to the new realities, *ii)* re-positioning of its services to meet the new market needs, *iii)* extending the postal territory to include the internet, *iv)* improvement of the range of the postal services offered and *v)* web-enabling of their services (Donohoe 2007).

Obviously, all of these issues are directly related to the universal service for the postal industry, and to the entire telecommunications industry.

5.2 The Universal Service

While the *term* “universal service” can be attributed to Theodore Vail, the former president of AT&T in the United States and his slogan “one system, one policy, universal service” for the telephone system (Mueller 1997 cited in Young 2005, p.189), the *concept* of universal service in communications had its foundations in the concept of Rowland Hill and his post office reform known as the *Penny Post reform* as described by Coase (1939). Although both approaches aimed to simplify the respective mode of communication, they both differed substantially from the universal service of today.

Especially for the telephone service, in the beginning universal service was not associated with the goal of high penetration rates. At the beginning of the 20th century, in the US, competition between competing telephone networks resulted in fragmented networks that lacked interconnection. Therefore the need to subscribe to different (fixed line) telephone networks at the same time arose. During that time, the term “universal service” can be considered rather to justify the establishment of the protected monopoly of AT&T and therefore the elimination of competition in order to solve these problems and it did not have the connotation of “a telephone in every home, affordability, or government policies to subsidize the telephone” (Mueller 1997, pp. 3-4 quoted according to Young 2005, p. 189).

Universal service including the meaning of “a telephone in every home” as it is commonly understood today returned as late as in the 1970’s to the policy debate in the US, when the rate-of-return regulation for local services was debated with the emerging competition for long distance calls. During that period the “regulated monopoly [...] (was) retroactively credited with making the telephone service universally available and affordable” (Mueller 1997, pp. 162, 166 quoted according to Young 2005, pp. 190).

Similarly, for the postal service, the original concept of Rowland Hill’s *Post Office Reform* of 1840 meant neither the delivery to every home throughout Britain. Although Hill’s concept included a certain amount of cross-subsidization from urban to rural areas, this element of his reform proposal was mainly justified by his observation, that even at that time only a minor share of the *transit cost* was dependent on the destination. Accordingly, his proposal originally only included the “primary delivery”, and neither the collection nor the local distribution of the mail (Coase 1939, pp. 423-424). Therefore he concluded that there should be – despite a change of the payment mode to pre-payment – a uniform charge for the “primary” mail conveyance between all *villages* in Britain (which quickly turned

out to have a great influence on the mail volumes), and that a (local) system of “secondary distribution has to be found in addition” (Coase 1939, pp. 427-428).

Recognizing, that “by definition, a Universal Service Obligation mandates a flow of subsidy toward one group of users or another” (Panzar 2001, p. 102), Coase proposed the local delivery to bear an additional charge according to the cost associated with the service level and regional conditions. Therefore the issue of redistribution was kept rather limited. He argued that “if this plan were adopted, the central authority of the Post Office would be relieved of nearly all care with respect to the secondary distribution of letters, the frequency, and, consequently, the expense of which would in each instance be regulated in exact accordance with the wants of the district.” So “what he advocated was not uniformity, but uniformity in so far as it was justified by its costs” and combined it with a subsidiarity approach for the local delivery (Coase 1939, pp. 429-430).

Today, the USO in the postal as well as in the telecommunications industry is designed to safeguard the public’s access to a minimum range of (basic) services. It is associated with the entitlement of natural or legal persons to obtain a certain set of services at a specified quality on reasonable terms at any location within a certain territory and might also include certain infrastructure requirements. Exceptions normally are only allowed in cases of extreme geographic, demographic or weather conditions (i.e., if huge distances, extremely sparse population or, e.g., extreme winter conditions render “normal” postal service unfeasible).

From an economic point of view, the justifications for such a policy are limited and should be carefully considered. The USO hardly can be conceived as an instrument of the policy set with the goal to improve allocative efficiency, but merely includes “very dominant non-economic dimensions, such as distributional or structural policy”, although there are arguments related to externalities and to dynamic (innovation) efficiency (Hart 1998, p. 840).

Basically, the *first* of the two main justification categories are socio-economic reasons (defined as “goals to be aspired to at any given time irrespective of historical context or economic circumstances”, McNeil 2001 quoted according to Young 2005, p. 191). These reasons mainly are based on the idea, that a basic access to telecommunication services is a necessary prerequisite for participation in a modern society.

Similarly to utilities like electricity or water, communication services are considered as “essential to life”, and therefore the provision of these services can be considered as *merit goods* which are “defined as being a part of a ‘regulatory safety net’ that is recognized as necessary by the vast majority of society” (WIK

1999, p. 32). This argument can be further supported by the fact, that such essential services might exhibit indirect externalities, for example, if the access to certain services is a necessity to be able for education and to participate in the labor market (Hart 1998, p. 845). However, opponents of such arguments find that “it is difficult to argue [...] (that the major social function) places it beyond the realm of discretionary consumption” and see “structurally imposed needs” (Young 2005, p. 193).

The *second* category are (purely) economic justifications such as considering the communication networks as essential for growth and due to the involved network externalities. On the one hand, communication service levels were *correlated* highly with income measurements such as per capita income and GDP. On the other hand, the *causal direction* is not fully clear in all situations because a growing economy requires the growth of its communication infrastructure, which in turn provides not a justification for a universal service so far (Young 2005, p. 195).

The most convincing argument therefore seems to be that innovation and development in a modern information society is cumulative and itinerative which causes broad network access to invoke innovative use which in turn expands the network further and so on (Young 2005, p. 196).

Considering these arguments concerning the *existence* of a USO and concluding that a certain level of universal service is not only politically but also economically desirable, the problem of the determination of the efficient level of the USO still remains.

In contrast to “purely” economic regulations like price or access regulation, over time, the postal as well as the telecommunications USOs have been steadily extended concerning their goals. In this period, the communications revolution has brought significant transformations to the concept of universal service for communication over the last 20 years. Universal service has evolved from common carriage (serve all with no discrimination) to a right to access basic services with full coverage for reasons of cohesion. Moreover, the universal service is now discussed as a remedy to an informational divide, as the access to information and content as opposed to services becomes increasingly important.

Concerning the scope and exact definition of any USO, an optimum has to be found which balances cost and utility. Problems arise from public choice theory where policymakers pursue their interests against the profit-maximizing interest of the firms, with both being likely to fail to match the public interest. In consequence, technologies might be chosen that are not efficient in the long run (structural change might be too early or too late, consumer preferences might be

preempted wrongly, cf. Young 2005, p. 200), and on the flipside of the coin, “high USOs can be damaging to the economic welfare of a country” (WIK 1999, p. 19).

Although it is desirable from a social and from an economic viewpoint to strive for a certain degree of equity, the egalitarian and social arguments should be carefully balanced against the economic arguments in order to keep the solution cheaper than the gains or potential problems without any public intervention (cf. Young 2005, pp. 204-205 and WIK 1999, p. 9).

Moreover, the design of any USO should reflect the technological dynamics of the telecoms, information service, and – due to the interrelation – postal markets, which are sufficiently high to discuss the appropriateness of a dynamic universal service definition instead of a regular review of a static definition. For example, this approach which is currently taken by the current EU regulation involves at least a three-stage policy lag of *i)* a recognition lag between market developments or technology changes and the initiation of the European legislation process, *ii)* a decision and implementation lag on the European level, and *iii)* an implementation lag in the member countries. It appears questionable whether such an approach is able to stay in pace with increasingly dynamic developments. Therefore, the establishment of a dynamic framework might be preferable for the future development of the universal service (Hart 1998, p. 839).

Finally, an indirect approach to perceived or actual market deficiencies using public or industry-funded direct subsidies or tax deduction possibilities to consumers could be more efficient and effective in realizing the policy goals, although at the moment there seems to be no chance to implement such a radical approach allowing to trim universal services to an absolute minimum. Hart even asks why not to discard national funding solutions and points to a European fund as a source for all deficitary services throughout the member states, similarly to the structural development fund (cf. Hart 1998, pp. 844, 852).

5.3 The information society and the EU 2020 strategy

The Lisbon Agenda in 2000 asserted that for Europe to remain economically competitive on a global level, its citizens had to embrace the competencies required to be able to participate in the knowledge economy and in an increasingly globalized information society. The *Europe 2020 strategy*, which succeeded the Lisbon Agenda, laid out the EU’s new strategy for sustainable growth and jobs.

It features plans for high speed internet access, lower prices and unlocking the potential of unused spectrum waves for new services.

In order to further secure future economic growth, the combined EU 2020 strategy aims to achieve (EU 2010a, 2010b):

- Smart growth
- Sustainable growth
- Access to high speed internet by 2013 for all Europeans
- A resource-efficient Europe and the shift towards a low-carbon economy
- A shared common sense of urgency

The way to achieve these goals should be to promote innovations, to make full use of information and communication technologies and to ensure that innovative ideas can be turned into new products and services in combination with a focus on user needs and market opportunities. In addition, during the development of the strategy also structural weaknesses have been exposed. The main weaknesses were identified to be “talents and ideas risk going to waste because of uncertainties, sluggish demand and lack of funding” and insufficient use of information and communication technologies (EU 2010a, pp. 7).

Of special relevance here is also, that the European Commission mentioned, that some sectors might have to “reinvent” themselves and that she wants to promote the restructuring of sectors in difficulty towards future oriented activities and to support this transition of service [...] sectors with a review of regulations (EU 2010a, pp. 9-10, 15).

The main objective of the Information Society is to put the potential of knowledge and information and communication technologies (ICTs) at the core of the economic development. Effectively, ICTs are regarded as tools for achieving development, enabling citizens to participate in society and the economy and releasing economic potential by improving efficiency and through the introduction of innovative products and services. ICTs are considered to connect the three dimensions of e-inclusion, e-services and e-government in order to reach the highest possible development path. Simultaneously, these dimensions denote the main fields for policy goals:

First, e-inclusion refers to the participation in the Information Society which is becoming increasingly a prerequisite for the participation in economic and social development in the digital era. Against this background, the term “digital divide” refers to the gap between those who have access to ICTs that enable participation in the Information Society and those who do not. Because e-inclusion

is considered to be key for the social cohesion all over Europe, it is an issue that remains high on the agenda of national and international ICT policymakers.

Initially, the e-inclusion and digital divide concept was initially used for the technical, physical barriers hindering the penetration of ICT tools; however, the emphasis has shifted towards social barriers and now refers more to a social divide that develops according to who has and does not have access, enough competence and experience to benefit from digital services and modern electronic networks. Internet access is best understood as a spectrum, ranging from people who have never been online, to those who have dial-up or sporadic access, to those who have broadband at work, at home and on the move.

Education and in general the transfer of knowledge is increasingly dependent on digital technologies. The media literates can access these technologies without difficulty, which enables them to engage with, and participate in every level of public life, from social networking to e-government. Individuals not qualified to use digital technologies are often isolated from this perspective and are excluded from the benefits of digital participation or online communication. The digital divide can sometimes be explained by social, educational, economic or cultural background whereas the differences in adoption break out prominently along two particular dimensions, which are not mutually exclusive: education and income.

In order to support the Europe 2020 strategy, the goal is to improve media literacy and ICT skills to improve e-inclusion. Accordingly, the e-inclusion Ministerial Declaration of 2006 approved by the leaders of 32 European countries (EU and non-EU) set definitive objectives (EU 2006a): the digital divide between groups facing exclusion (the elderly, the unemployed, those living with disabilities) and the majority of the society must be reduced by 50 % by 2010 in the EU.

Second, e-services and the “digital economy” as the sum of all economic and social activities enabled by ICTs such as the internet and mobile networks is an integral part of the information and communication society.

It is generally agreed that the digital economy is essential to a country’s productivity, global competitiveness and improved social well-being. Indeed, the European Commission studied how a country could use the digital economy to maximize its potentials and concluded that according to its base-line scenario, there is still a potential to generate up to € 55bn of additional annual income (EU 2011, p. 11) and to create up to 700,000 new jobs by 2015 (EU 2010c, p. 25). While governments are typically entrusted with filling the gap left by the market, addressing social inequity, protecting the community and assisting markets to

work fairly and efficiently, in the end, however, transforming the advanced world's economies into digital economies is appropriately a market-led phenomenon.

Third, e-government services aim to facilitate interaction between citizens and firms with the government and administrations, thus lowering the overall transaction cost of the whole economy and fasten the related procedures in order to save time as a valuable resource. Improvements in the fields of the available service range, accessibility, usability, as well as their sophistication concerning, e.g., taxes, registrations, administrative services, permits, declarations, certificates, public procurement, and social transfers are considered to have similar effects as the improvement of private e-services and to increase social welfare (Cappgemini et al. 2008).

To improve these services, all governments throughout Europe strive to improve their e-government services through a wide range of actions, while the European Commission annually support these efforts with further activities such as benchmarking.

Additionally, supportive action is also taken either by the countries and/or telecoms, postal, or specialized operators issuing secure digital identities in the form of electronic ID cards or by integrating such technology in the national ID cards. These systems address a large part of the existing security, trust, authentication, and confidentiality problems existing on the contemporary internet and can be expected to increase the momentum and foster the development of the digital economies.

5.4 Rethinking the Universal Service

Given the general market developments, the dynamic progress of ICTs, rapidly changing customer needs and expectations and the related impact on postal services and operators as described above, and taking into account the EU 2020 strategy with the recognized necessities for some industries (as the postal industry) to “reinvent themselves” (EU 2010a, p. 16) and for regulators to review existing regulations in order to support the transition of these industries, it comes clear, that the postal USO is one of the regulations that deserve revision and modernization.

While the advantages of a legal USO include that there exist minimum standards that are known to all, allowing them to plan accordingly and reducing the possibility of unequal treatment, it has also a number of disadvantages. It might limit competitive advantages if competition exists, and efficiency improvements

and entrepreneurial flexibility in general. If legal, the definition of the USO should reflect a set of minimum services required by the public interest and it should not introduce everywhere the maximum achieved anywhere. In many cases, the use of other forms of communication presumably leads to a decreased importance of the service under consideration in many areas; therefore the USO requirement developments should reflect this (Fritschler et al. 2008, app. H, pp. 13-14).

Although the regulatory frameworks for telecommunications operators seem to be at least generally appropriate, the aim for better regulation certainly would include a special emphasis on the investment possibilities and incentives for broadband operators, independent of the network they use (fixed telephony, cable TV, mobile, wireless at fixed locations, or fiber-optical). Sufficient access to radio spectrum, facilitating cooperation for the roll-out of new networks, and sophisticated access regulations preserving the value of investments in combination with regulatory certainty and considering the consumer interests certainly are encouraging the development of the information society.⁶

Despite that the public sees the merits of universal internet access and wants it, priority should be given to market-based solutions, and to allow internet access to be supplied at different speeds and through different networks, since mandatory broadband supply bears the risk of choosing an inefficient technology. Broadband USO regulations should be defined with scrutiny and at speeds that can be accepted as “essential”, like basic digital subscriber line (DSL) connections, although it is likely, that even for remote villages it will be of prime importance to have an internet connection before seeing a postal carrier in person.⁷

At the same time, increased availability of broadband online access gives also rise to more possibilities to redesign the postal USO in a way, such that the long-term viability of the postal industry can be secured without the need for large amounts of subsidies, neither from redistributive industry funds, nor from public means.

Since postal services compete not only with parcel and express services (at the margin), but mainly with electronic communication means, the emergence and increasing importance of these substitutes create challenging issues for regulation and the need to react accordingly (OECD 2005b, pp. 9-12, 119, 123).

Thereby, thinking about appropriate levels of universal service puts not the universal postal service concept under attack, but the design of the USO. An appropriate postal USO adds the consideration of electronic substitutes to the regu-

⁶For one approach to dynamically efficient regulation, see Baake, Kamecke, and Wey (2007).

⁷Examples provide, e.g., France (512 kbps), Switzerland (600 kbps), or Finland (1 mbps).

latory rule set, which largely has not been done so far, as the following statement underlines: “The universal postal services mainly between private persons may be partially substituted by other text communications services (SMS, e-mail), but most of the postal items is business-to-consumer letters. These partial substitutes have not affected regulation in any ways. [...] So the postal regulation tries to help the entry of other postal operators into postal service market, but the competition from other text communications technologies such as fax, e-mail, text messaging and others does not influence the postal regulation.” (OECD 2005b, pp. 160, 164: Submission of Hungary).

Generally, the principles of necessity and proportionality of regulation are valid also for universal service obligations, whereas non-universal service should be withdrawn from sector specific regulation in order to keep the total costs low, since the lower the (residual net) cost of providing the universal service to the (historically) incumbent operators, the lower the cost for the whole industry and, thus, for the whole society. Also, it should be kept in mind, that “while of the state’s activities are unquestionable essential, even well-run liberal democracies do far more that they can do well and almost certainly than they need to do. There are strong pressures for government to ‘do something’ where nothing might be far better” (WIK 2005, p. 186).

Although complete withdrawal of universal service regulation is not an option from a political point of view, it might well be the case that keeping up a nationwide postal service would be in the self-interest of the universal service providers even without the legal obligation (cf. also Baake and Wey 2007a).

The reasons for that include the huge investments in sorting facilities as well as the role of economic enablers between the physical and the digital world the postal operators aim to fulfill. Posts already have moved into the “multichannel space”, offering a large variety of services from data services to customer response management and payment management, and now are expanding further into that space to make postal services mobile by making them digital – or even expand their business through diversification in mobile network services themselves.

For example, in Ireland, An Post has launched the mobile virtual network operator “Postfone” which is based on prepaid subscriber identification modules (“SIM cards”) from Vodafone, offering a single simple tariff.⁸ Such a system based on wireless technology could eventually turn out to be an well-suited platform for universal service transition, since with an own mobile virtual network operator

⁸hellmail (08. June 2010): An Post Invests In Postfone.
(<http://www.hellmail.co.uk/postalnews/anviewer.asp?a=2232&print=yes>).

not only additional revenues could be obtained, but also postal sites could easily be made accessible for free in order to increase the acceptance of any digital delivery service or to provide enhanced services like short message notification in case of incoming letter mail and parcels.

Another example is e-post, an online service from Canada Post, where private customers can view, pay and manage also their bills online. Instead of visiting multiple websites, the consumer receives all his or her bills from organizations subscribed to the service into one online mailbox. This mailbox can be accessed via its own URL or at the website of the consumer's preferred online bank. Secure payment and organization of the bills is carried out from one virtual location, making the service convenient.

The ability to scan a letter and send the content to a distant customer via a secured electronic mailbox would significantly decrease the cost of delivery and offer receivers more choices with their mail. Such services allow users to manage their mail remotely through a personal electronic mailbox where they can see their mail and request that the company open it and scan it for them. Interestingly, very few items sent via Earth Class Mail end up being delivered physically. In addition to providing customers with a choice in how to receive their mail, posts can contribute to the protection of the environment by helping their customers to shift to electronic transactions when and where this form of communication is appropriate (Lesur 2007, pp. 14-15).

More generally, their role as multichannel communication providers (similar to the former PTTs) could be crucial to adapt to the new market realities: "We could see that physical mail volume would drop over the years and we saw that we would need to offer different things to our customers. Our strategy is that it shouldn't matter for us if the customer needs some kind of physical or digital delivery. We are and should be able to receive any kind of data and handle it physically or digitally. It's just adapting to market demands and accounting for the strong impact of technology." (Belli 2010, p. 45).

With an ongoing USO, nevertheless there are several options worthwhile to be considered:

First, the traditional variants relaxing the obligations in order to save costs, e.g., centralized PO boxes, reduced delivery frequencies in remote areas, the outsourcing of rural deliveries, or differentiated pricing, although political support can be assumed to be lacking today.

Second, the service levels required might be made *contingent* upon the availability and/or acceptance of convenient alternative means. For example, a recipient

might not insist on a daily delivery if he gets in turn a workable electronic delivery (thereby ensuring that all requested items are delivered physically). For reasons of planning security, this also could be combined with the approach of Hart (1998), where different classes for the telecommunications services are defined, and where the minimum postal delivery frequency is made contingent upon the classification of the according location (“Class I: Basic high quality services (Minor League), Class II: State-of-the-art services (Major League), Class III: Broadband for all (Bandwidth League)”, see Hart 1998, p.848). Although this system creates a two- or three-tier system, it might be fully in line with the users’ preferences if they gain more from electronic access than they lose from reduced delivery frequency, and it might even speed up delivery, if the mail is scanned already in the outward mail sorting center. According to Itella, their trial tests with a system like that in Anttila, Finland, had gone very well.

As an orientation for the design of the service quality requirements of the different tiers, the service charter proposal template from the Strategic Review of the Canada Post corporation might come in handy: It defines three percentage values of mail which have to be delivered within two to four working days, three shares of the population with daily, three-times-a-week and weekly service, and it contains elements to ensure that only communities are not served on a daily basis if an appropriate rationale exists in order to safeguard the citizens interests (Campbell 2008, pp.105-108). With such an approach, the population density metrics should be considered, too (Accenture 2008, p. 45).

In addition, it can be argued, that postal operators have the interest to stick to excellence in delivery, since it represents their quintessential core competence and they should understand the dangers of reducing their quality which might be “playing in the hands of their competitors” and may cause further volume declines, both from end-to-end and access customers (Crew and Kleindorfer 2010, p.14). This view is confirmed by other authors who estimate the traffic reduction effect of delivery frequency reduction between 15 and 20 %, depending on the initial and the new situation (Pearsall and Trozzo 2010 and Boldron et al. 2008). This is, although only some mailers still have to rely on everyday delivery (communications, newspapers), while others require rather day-definite delivery (advertisements on Friday). Therefore a varying frequency according to the mailing patterns and the related volumes, to geographic density, or to particular content are options that should be open for consideration.

On the receiver side, a survey conducted on behalf of the USPS showed, that slight decreases in delivery frequency to five days a week to the majority of the

respondents would not affect them at all or very little, while a reduction to three days a week would be very significant for 42 % of the respondents in rural areas. Interestingly, two thirds of the respondents would eliminate Saturday delivery, followed by Monday and Wednesday with about ten % each (Fritschler et al. 2008, pp. 9-10). If such service adoptions occur only if broadband services are made available, even the leaving signals giving up on community or certain regions is avoided.

One drawback of such an approach is, that, looking at the post offices, it can be expected that their number is likely to decrease or at least that they are transferred to franchisees, because in most countries the distribution of post offices is very different than it would be if post offices were distributed on the basis of market forces. Arguably, pharmacies are at least as important to the average citizen as post offices. Comparing the geographic distribution of a commercial service, like pharmacies, with the distribution of post offices illustrates what the distribution of post offices may look like if it would be driven by market forces. It is likely that the distribution of post offices in most postal administrations is disproportionately rural (Cohen et al. 2008, pp. 325, 331, 335).

When postal administrations enjoyed strong monopolies, this kind of non-economic distribution was quite acceptable. The monopoly forced everyone to pay for various types of non-economic behavior. However, postal administrations face increasing indirect competition from the internet and (the prospect of) direct competition from liberalization. It is likely that bulk mail and not single-piece mail will be subject to direct competition. If so, it will be difficult to charge the cost of the retail network to competitive bulk mail, since most mail-related retail activities are for single-piece mail (Crew and Kleindorfer 2010, p. 1).

This problem stems from the fact, that the mechanisms currently financing universal service are best suited for a regulated market where limits on competition guarantee economic returns that are sufficient to allow firms to subsidize their own high-cost consumers.⁹ In very remote areas revenues from subscribers to the postal network could be taken into consideration. If such a subscription would include a certain amount of letter mail to be picked up and sent without additional charge (similar to a volume plan for mobile subscribers), this might be an interesting option for regular users of mail.¹⁰ Alternatively, a price break

⁹Report of the US Senate No. 108-318, 108th Congress, 2nd session, 22-23 (August 25, 2004).

¹⁰In the United States and in other countries, rural carriers already provide retail services to recipients along their route. In this way, they can obtain virtually every service offered to consumers and small businesses. In most cases, however, customers of closed offices feel that

could be granted if they opt out for less frequent delivery or for pick-up from a local retail outlet (Matthews 2004), although since the signing of the deed of understanding between the postal operator and the government in New Zealand the postal operators seem to refrain from this funding option.

A less disputable change in pricing is related to the uniformity of tariffs which can be expected to stay for households and small businesses (single item mail), but is unlikely to remain for bulk mail (as it is already differentiated in Germany, the Netherland, New Zealand and Sweden). Uniform tariffs in combination with network access allow for cherry-picking of competitors, therefore it should also not be mandated by the regulator (WIK 2005, p. 138). In addition, by allowing flexible and zonal access pricing, subject to transparency and non-discrimination rules, regulators can help to promote a climate in which access and wholesale operations of the postal operators can grow, while simultaneously promoting customer-focused innovations in their end-to-end retail operations to preserve single-piece volumes (Crew and Kleindorfer 2010, p. 14). On the other hand, due to the fact, that new competitors often serve only the market for bulk mail, in order to keep the pricing schedule simple, and due to the little cost differences already observed by Rowland Hill (see above), uniform pricing is less problematic if it is required for single items,¹¹ in some countries it is practiced anyhow although it is not required.¹² Furthermore, such a pricing schemes also in line with the preferences of the customers, where medium and large mailers would accept non-uniform rates, while consumers and small businesses are reluctant to accept such a pricing scheme (WIK 2005, p. 109).

5.5 Conclusion

Of all the elements of a nation's infrastructure, the communication technology infrastructure is the most rapidly evolving one. Because it never happened that a new communication medium like the telephone or the television has ever replaced a previous means of communication completely, and although "postal services are not part of a sunset industry, but rather will continue to play a significant role in the world's economy and information society for years to come" (Accenture

rural carrier service is an inadequate substitute. In communities where post offices have been closed, there are few if any, businesses catering to the residents (Cohen et al. 2008, p. 327).

¹¹As it is the case, e.g., in Austria, Australia, Belgium, Spain, Poland, France, the Netherlands, Sweden, UK, Finland and the US, cf. Accenture 2008, p. 39.

¹²This is the case in Italy, Canada, Germany and New Zealand, see Accenture 2008, p. 39.

2008, p. 16), the postal sector nevertheless faces its relative position in the communication mix being challenged.

Therefore there may be a change of the universal service based on the change of the social and economic status of a service once it passes a certain threshold. It follows, then, that once a service becomes widely used, access to the service becomes a definition of economic and societal participation, or an inclusive right (or, vice versa, the scope of the right is reduced). The current discussion as whether to widen the definition of universal service beyond the provision of one specific type of service to encompass a multi-channel USO concept called the technology-neutral USO or the communication USO should lead in tendency to a reduction of the “classic” postal part of the USO. While such a move could be considered more in line with the changing market reality, new questions could emerge such as what services should be covered by the redefined universal service obligation, and on what terms.

For several reasons rethinking, re-evaluating, and re-designing the USO is appropriate. First, we have moved away from the monopoly approach in telecommunications and, soon in Europe, postal services. Postal operators compete not only with each other, but also against other players operating different modes of conveyance. Second, the rapid progress of telecommunications technologies and their convergence with other forms of communication present an opportune time. This is particularly the case given the extent to which telecommunications such as facsimile, e-mail and internet access now substitute for postal services. Moreover, internet-powered technologies might allow us to redefine the letter mail delivery model. We see evidence of this already when postal consumers in remote areas opt to accept less frequent mail deliveries in exchange for improved electronic substitutes. Still, the concerns regarding providing service in rural and remote areas will remain a significant issue for a long time. In remote areas, there are relatively more households that have inadequate access to telecommunications services and that rely more strongly on the postal service. However, governments are stepping up their efforts to roll-out high-speed broadband services to every household in the country and encourage digital inclusion. With these developments, the pressure on posts increases, but at the same time new windows of opportunity open and possible synergies between mail and ICT technologies shape the answers to the question on how the future USO shall be designed.

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