

Blankart, Charles B.; Knieps, Günter; Zenhäusern, Patrick

Working Paper

Regulation of new markets in telecommunications? Market dynamics and shrinking monopolistic bottlenecks

Diskussionsbeitrag, No. 112

Provided in Cooperation with:

Institute for Transport Economics and Regional Policy, University of Freiburg

Suggested Citation: Blankart, Charles B.; Knieps, Günter; Zenhäusern, Patrick (2006) : Regulation of new markets in telecommunications? Market dynamics and shrinking monopolistic bottlenecks, Diskussionsbeitrag, No. 112, Albert-Ludwigs-Universität Freiburg, Institut für Verkehrswissenschaft und Regionalpolitik, Freiburg i. Br.

This Version is available at:

<https://hdl.handle.net/10419/32315>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.

Regulation of New Markets in Telecommunications?

Market dynamics and shrinking monopolistic bottlenecks[†]

by C.B. Blankart*, G. Knieps**, P. Zenhäusern***

Discussion Paper

Institut für Verkehrswissenschaft und Regionalpolitik

No. 112 – August 2006

Abstract:

In the EU telecommunications regulatory framework a strong intention to avoid overregulation with respect to new markets can be observed. However, a clear-cut economically based analysis of the remaining need for sector-specific regulation is still missing. In this paper, the question is analyzed whether new markets create new monopolistic bottlenecks or extend the borderlines of existing bottlenecks. Three kinds of transmission qualities on service markets can be differentiated according to the products provided: narrowband services like PSTN/ISDN or GSM, semi high-speed broadband services like broadband internet access up to 6 Mbps download and VDSL services up to 50 Mbps. As long as, due to the absence of alternative network infrastructures, a monopolistic bottleneck in local infrastructure networks exists the question arises what the remaining bottleneck components are for these different markets. In this paper we will demonstrate the shrinking-bottleneck hypothesis.

* Humboldt-Universität zu Berlin, Faculty of Economics, Spandauer Straße, 1 10178 Berlin, Germany, email: blankart@wiwi.hu-berlin.de

** Corresponding author: Prof. Dr. Guenter Knieps, Institute for Transport Networks and Regional Policy, Albert Ludwigs-University, Platz der Alten Synagoge, 79085 Freiburg i. Br., Germany. Tel.: +49 (0)761 203 2370; fax: +49 (0)761 203 2372; e-mail: guenter.knieps@vwl.uni-freiburg.de

*** Plaut Economics, Baslerstr. 37, 4600 Olten, Switzerland, e-mail: patrick.zenhaeusern@plaut.ch

[†] Paper to be presented at the 17th European Regional ITS Conference, August 22-24, 2006, in Amsterdam

1. Introduction

From the very beginning of EU liberalization of the telecommunication sector the focus was on the involvement of new and innovative telecommunications markets. After global entry deregulation the struggle over the division of labor between sector-specific market power deregulation versus general competition law began. In the meantime, a strong intention to avoid overregulation with respect to new markets can be observed in the EU telecommunications regulatory framework. However, a clear-cut economically based analysis of the remaining need for sector-specific regulation is still missing. A necessary requirement for future regulatory reform is the application of a symmetrical regulatory approach, focussing on network-specific market power based on monopolistic bottlenecks with no intrinsic bias towards any firm or technology.

The question arises whether new markets can create new monopolistic bottlenecks or extend the borderlines of existing bottlenecks. Three kinds of transmission qualities on service markets can be differentiated according to the products provided: narrowband services like PSTN/ISDN or GSM, semi high-speed broadband services like broadband internet access up to 6 Mbps download and VDSL services up to 50 Mbps. As long as, due to the absence of alternative network infrastructures, a monopolistic bottleneck in local infrastructure networks exists, the question arises what the remaining bottleneck components are for these different markets. In this paper we will demonstrate the shrinking-bottleneck hypothesis.

The paper takes as its starting point the issue of new markets and its implications for sector-specific regulation, according to the EU telecommunications policy (see chapter 2). From there it proceeds to explain the reference point, i.e. how the regulatory subject is to be defined based on network economics (see chapter 3). This part of the paper is followed by the implications for telecommunications regulation (see chapter 4).

2. New markets and EU telecommunications policy

From the very beginning of EU liberalization of the telecommunications sector the focus was on the involvement of new and innovative telecommunication markets (e.g. Knieps, 2001, p. 645). The concept of open network provision (ONP) was introduced to stimulate entry to the new markets for value added network services (VANS). In the period of partial entry deregulation the focus was on the problems of non-discriminatory access to monopolistic network infrastructures (“Framework Directive” 90/387/EEC of 28 June 1990).¹

After global entry deregulation (“Full Competitive Directive” 96/19/EC of 13 March 1996)² the struggle over the division of labor between sector-specific market power deregulation versus general competition law began. An important corner stone within the EU-ONP-regulation followed with the “Access Notice” of the European Commission.³ This document pointed out the importance of the concept of the “essential facilities” indispensable for reaching customers (section 68) within the context of EU competition law, in particular Article 82 (e.g. Ungerer, 2000, p. 217). The expression “essential facilities” is used to describe a facility or an infrastructure which is essential for reaching customers and/or enabling competitors to carry on their business, and which cannot be replicated by reasonable means. With the supply of access to the facility to one or more competitors the abuse of a dominant position and the possibility of thus preventing the emergence of a new product or service should be avoided (Ungerer, 2000, p. 229).

¹ Council Directive 90/387/EEC of 28 June 1990 on the establishment of the internal market for telecommunications services through the implementation of open network provision, *OJ L* 192, 24. 7. 1990, p.1 (the „Framework Directive“).

² Commission Directive 96/19/EC of 13 March 1996 amending Directive 90/388/EEC with regard to the implementation of full competition in the telecommunications markets, *OJ L* 74, 22. 3. 1996, p. 13 (the „Full Competition Directive“).

³ Notice on the application of the competition rules to access agreements in the telecommunications sector.- Framework, Relevant Markets and Principles (98/C265/02), Official Journal of the European Communities, 22. 8. 98, S. 2-28.

The 1999 EU Review started with the goal of maximization of the application of the general European competition law, the minimization of sector-specific regulation, a rigorous phasing out of unnecessary regulation, and the introduction of “sunset” clauses (ONP COM 98-42, p. 3). Nevertheless, the unspecific regulatory obligations based on the EU Directives of the 1999 Review package, in particular the Framework Directive⁴, and the Access Directive⁵ resulted in a tangle of contradictory decisions and statements (e.g. Knieps, 2005, p. 78). The Commission’s Guidelines (European Commission, 2002) do not present a clear and economically well-founded concept for localising network-specific market power. Even the criteria of general competition law are not considered consistently. Although it is stressed that the existence of a dominant position cannot be established on the sole basis of large market shares and would require a thorough and overall analysis of the economic characteristics of the relevant market (European Commission, 2002, recital 78), it is argued that the doctrine of the ‘essential facilities’ would be less relevant for the purposes of ex ante applying Article 14 of the Framework Directive than ex post applying Article 82 of the EC Treaty (European Commission, 2002, recital 82).⁶ Nevertheless, the three criteria in the Commission Recommendation of February 2003 (European Commission, 2003a, recital 9) seem to substantiate the criteria for regulatory intervention. In order to justify the imposition of regulatory obligations on a given market, the following criteria are listed. “The first criterion is the presence of high and non-transitory entry barriers whether of structural, legal or regulatory nature. ... the second criterion admits only those markets, the structure of which does not tend towards effective competition within the relevant time horizon. The third criterion is that application of competition law alone would not adequately address the market failure(s) concerned.”

⁴ Directive 2002/21/EC of the European Parliament and of the Council of 7 March 2002 on a common regulatory framework for electronic communications networks and services (Framework Directive), OJ L108/33, 24. 4. 2002.

⁵ Directive 2002/19/EC of the European Parliament and of the Council on access to, and interconnection of, electronic communications networks and associated facilities (Access Directive), OJ L108/7, 24.4. 2002.

⁶ This is a definite step away from the Access Notice of August 1998, which extended the role of competition policy, pointing out the importance of ensuring non-discriminatory access to essential facilities.

At the same time, special rules were developed focusing on the emergence of new markets or new products. The application of the essential facilities doctrine in the context of article 82 has been considered as relevant where the refusal to supply or to grant access to third parties would limit or prevent the emergence of new markets or new products (recital 81 guidelines). Moreover, recital 9 of the Commission's Guidelines states: "however, given the dynamic character and functioning of electronic communications markets, possibilities to overcome barriers within the relevant time horizon have also to be taken into consideration when carrying out a prospective analysis to identify the relevant markets for possible ex ante regulation." Recital 15 states: "Furthermore, new and emerging markets in which market power may be found to exist because of 'first-mover' advantages should not in principle be subject to ex-ante regulation". Nevertheless, within the Annex of the same Recommendations the markets considered for possible regulation may also involve new markets, such as interactive cable television (see market 12 wholesale broadband access). Nevertheless, the Commission stated: "When there is effective facilities-based competition, the new framework will require ex-ante regulatory obligations to be lifted. Investment in new and competing infrastructures will bring forward the day when such obligations can be relaxed (European Commission, 2003b, p. 6).

Thus, it can be concluded that within the EU telecommunications regulatory framework a strong intention to avoid overregulation with respect to new markets can be observed. However, a clear-cut economically based analysis of the remaining need for sector-specific regulation is still missing. This is the goal of the following section.

3. New markets and network-specific market power regulation

3.1 Localization of monopolistic bottlenecks

EU telecommunications policy has been strongly influenced by asymmetric market power regulation with an intrinsic bias against incumbent carriers. As a consequence, excessive regulation due to an oversized regulatory basis occurred (e.g. Knieps, 2005). The specification of the regulatory basis is not explicitly

founded on the identification of network-specific market power, instead classification as a dominant firm as laid down in competition law is chosen as the central precondition to justify sector-specific regulation. For example, the provision of long-distance telecommunications infrastructure and voice telephony services by a carrier classified as dominant on those markets has been considered non-competitive, although active and potential competition in itself is sufficient to discipline market power. A necessary requirement for future regulatory reform is the application of a symmetrical regulatory approach, focussing on network-specific market power based on monopolistic bottlenecks with no intrinsic bias towards any firm or technology (e.g. Knieps, 2006, pp. 51-59).

Criteria like relative market share, financial strength, access to input and service markets etc. can only serve as a starting point in order to evaluate the existence of market power; but the development of an *ex ante* regulatory criterion creates a need for a more clear-cut definition of market power. This is even more important, because “criteria for conjecturing a dominant position” on the basis of market shares can lead to wrong criteria for government intervention in network industries.

It is important to identify the regulatory basis by means of Stigler’s concept of entry barriers, focussing on the long-run cost asymmetries between incumbent and potential entrants.⁷ The sector-specific characteristics of network structures (economies of bundling) are not a sufficient reason to conclude that market power must exist.⁸ It is necessary to differentiate between those areas in which

⁷ “A barrier to entry may be defined as a cost of producing (at some or every rate of output) which must be borne by a firm which seeks to enter an industry but is not borne by firms already in the industry” (Stigler, 1968, p. 67).

⁸ The pressure of potential competition can be sufficient to discipline the behaviour of the active supplier, even if he is the owner of a natural monopoly. Such networks are called “contestable” (Baumol, Panzar, Willig, 1982). It seems obvious that, as soon as competition works, the behaviour of markets for network services becomes more complex than is assumed in the “simple” model of the theory of contestable markets. Examples may be strategies of network differentiation, product differentiation, price differentiation, creation of goodwill etc. However, even strategic behaviour on competitive markets for network services should not lead to the opposite conclusion to re-regulate these markets. In contrast, the very point of the disaggregated approach is the development of the preconditions for competition on the markets for network services.

active and/or potential competition can work and other areas, so-called monopolistic bottleneck areas, where a natural monopoly situation (due to economies of bundling) in combination with sunk (irreversible) costs exists. Sunk costs are no longer decision-relevant for the incumbent monopoly, whereas the potential entrant is confronted with the decision whether or not to build network infrastructure and thus spend the irreversible costs. The incumbent firm therefore has lower decision-relevant costs than potential entrants. This creates scope for strategic behaviour on the part of the incumbent firm, so that monopoly profits (or inefficient production) will not necessarily result in market entry. Regulation of network-specific market power is only justified in monopolistic bottleneck areas. In all other cases, the existence of active and potential competition will lead to efficient market results.

Opened network sectors should not be immunised against competition law, thus the objective of the concept of monopolistic bottlenecks is not the identification of those potential market imperfections that exist on all markets, but rather the development of stable criteria for the localisation of network-specific market power. Only the existence of the latter justifies *ex ante* regulatory interventions, as these are, by their very nature, more far-reaching than the *ex post* control of general competition law that applies to all markets (Knieps, 2006).

The network economic concept of monopolistic bottlenecks suggests a connection with the essential facilities doctrine resulting from US antitrust law, which is now also being used increasingly in European competition law.⁹ In accordance with this doctrine, a facility can only be regarded as essential if the following two conditions are fulfilled: (1) market entry to the complementary market is not actually possible without access to this facility, and (2) providers on the complementary market cannot, using reasonable effort, duplicate the facility; substitutes do not exist either (e.g. Areeda, Hoverkamp, 1988).¹⁰

⁹ This means that access to ports, airports or railway networks can neither be refused, nor granted under conditions that penalize competitors, without factual justification.

¹⁰ The fact that use of this facility is essential for competition on the complementary market is occasionally expressed as a third criterion, as it reduces prices or increases the volumes offered. This third criterion, however, only describes the effects of access.

The application of the essential facilities doctrine means that a traditional instrument of competition law can be used as a regulatory instrument. A facility is regarded as essential when it fulfils the criteria for classification as a monopolistic bottleneck facility in the context of the disaggregated regulatory approach. The starting point for this approach is to differentiate between those network areas in which active and/or potential competition is possible, and those network areas in which stable network-specific market power can be localized.

The disaggregated regulatory approach involves applying the essential facilities doctrine not only on a case-by-case basis, but to a category of cases, namely to monopolistic bottleneck facilities. If the relevant market does not have the characteristics of a natural monopoly, the application of the essential facilities doctrine would not only be pointless, but detrimental (e.g. Lipsky, Sidak, 1999, p. 1220). The non-discriminatory conditions of access to the essential facilities must be set out in more detail as part of the disaggregated regulatory approach. In doing so, the application of the essential facilities doctrine must be seen in a dynamic context. The aim must therefore also be to design the conditions of access so as not to hinder infrastructure competition, but instead create an incentive for research and development, innovations and investments at the facility level. This is the only way to establish a balanced relationship between services and infrastructure competition.

3.2 Implications for new markets

It is important to differentiate between network services and network infrastructure. Service markets should not be regulated, irrespective of whether they are old or new ones or whether players have high market shares or not (Knieps, 2006, p. 52). The question whether regulation of new markets could be justified is pointless on new markets for network services, because they are competitive.

Free entry to provide network services or network infrastructures should be granted. New services markets cannot be compared to a situation where certain actors should be protected like owners of patents. If a communications company

indeed obtains a patent for new equipment, which is used as input to provide a service or infrastructure innovation, the patent law is applicable anyway. But for new infrastructures allowing services that can't be offered based on current infrastructures the patent analogy is not applicable.

In order to allow active and potential competition on service markets, in particular new service markets, non-discriminatory access to monopolistic bottlenecks is necessary. To the extent that a monopolistic bottleneck is observable, ex ante regulation should be in place; otherwise the evolution of new service markets will be hampered. Innovative ways of access to existing bottlenecks should be guaranteed in order to allow the evolution of new service markets.

The owner of the monopolistic bottleneck can neither be forced to extend its infrastructure nor to do disinvestments. In particular, incremental investments, which are necessary to provide innovative network access, are to be covered by the demander of this innovative access. The overall responsibility for the network infrastructure remains with the network owner; otherwise regulation would foster network fragmentation. Incentive regulation in order to limit the level of access charges is necessary and should not be superseded by the argument of the importance of stimulating alternative infrastructure platforms. The reference point for economically efficient investment signals is a market rate of return and not a monopolistic profit. Unregulated monopolistic profits would result in investments into alternative access platforms and subsequent distortion between infrastructure and service competition.

Convergence of the telecommunications and information technology sector and resulting infrastructure competition should lead to a phasing out of bottleneck regulation rather than the extension of the regulatory basis. In an environment of competing infrastructures, even access holidays are overregulation and would be harmful for the development of new infrastructure.

4. Lessons for telecommunications regulation

4.1. Three criteria test in economic terms

In recent years the focus of regulatory attention has increasingly shifted towards incentives for investment. In this context the implementation of so called ‘Access Holidays’ has been proposed in order to protect investment incentives (e.g. Gans, King, 2003, p. 164; Baake et al., 2006). This means that it is guaranteed by the regulator that certain innovations, such as e.g. ‘Next Generation Networks’, are not regulated during a specific period of time. Thus, access holidays are a significant period during which an investor is free from access regulation. The idea is that such a holiday will increase investment incentives by allowing profits unhindered by regulatory intervention.

Dahlke and Neumann (2006) refer to the Framework Directive, where in recital 27 it is pointed out that the Commission should draw guidelines which “will also address the issue of newly emerging markets, where de facto the market leader is likely to have a substantial market share but should not be subjected to inappropriate obligations”. They note that this text passage could be interpreted as a leave of absence of sector-specific regulation and argue against this reading, however without showing why further regulation of telecommunications markets could be justified. It is a mere pleading to maintain the status quo of the current regulatory system, not an explanation of how sector-specific regulation may evolve based on sound economics. Because regulation from this point of view should be a well founded exemption in a free market economy, maintaining the status quo has to be justified as well.

Access holidays can only be a relevant concept if regulatory problems of network-specific market power still exist. Market dynamics can indeed reduce regulatory requirements; but one should not argue in reverse, that there should be no regulation at all and then – after a certain time period – start anew with sector-specific regulation. One has to analyze from scratch if new investments create network-specific market power. If not, sector-specific regulation is superfluous. Thus, the statement against “access holidays” should be justified, but is

not (e.g. Knieps, 2005, pp. 88-91). Dahlke and Neuman (2006) do only plead against it, but do not develop clear-cut principles for tackling regulatory problems in an environment of new markets.

In order to do so, the three criteria in the Commission Recommendation of February 2003 (European Commission, 2003a, recital 9) have to be rewritten in economic terms. The presence of high and non-transitory entry barriers – criteria one – could be defined in economic terms as a monopoly (high barriers) in combination with sunk costs (non-transitory entry barriers). Markets that do not tend towards effective competition within the relevant time horizon – criteria two – could be rewritten, stating that a monopoly in combination with sunk costs is stable over a foreseeable future. That the application of competition law alone would not adequately address the market failure(s) concerned – criteria three – requires a consideration whether ex ante or ex post intervention is more efficient. In the following explanation we focus on the criteria one and two. Both of them require not an ad hoc case-by-case analysis (formula based). The procedure has to be rule-based according to network economics.

The bottleneck theory is in accordance with the two criteria. It delivers stable criteria for localizing network-specific market power. Only by a specific disaggregated access regulation can potentials of service and infrastructure competition be exhausted. There will be no technology policy induced bias of competition of innovation. Irrespective of market proportions, no network-specific market power exists on new service markets. It is possible that they create a necessity for a wider unbundling. Conceptually, three cases have to be differentiated.

In general, with regard to the regulation of communications markets economically stable principles like the essential facilities doctrine are mentioned by the EU Commission. But there is also a consistency problem that can be observed. So the guidelines on market analysis (European Commission (2002) state in recital 81: “In particular, the doctrine of ‘essential facilities’ is complementary to existing general obligations imposed on dominant undertaking, such as the obligation not to discriminate among customers and has been applied in cases under Article 82 in exceptional circumstances, such as where the refusal to supply or

to grant access to third parties would limit or prevent the emergence of new markets, or new products, contrary to Article 82(b) of the Treaty.”

Anyway, the development of the three criteria in the Commission Recommendation of February 2003 (European Commission, 2003a, recital 9) can be seen as a refinement of the essential facilities doctrine. So on one hand there are well-founded principles, which can be substantiated by the theory of monopolistic bottlenecks, on the other hand there is a practice that thwarts these principles.

Two examples may illustrate this:

- (1) If the three criteria had been applied consistently, no end user market would have been recommended to be presumably in need of regulation (Knieps, 2005). Also, input markets, such as interactive cable television, internet etc., would have been specified in more detail. There, e.g. on the basis of the Cable Review (European Commission, 1998), conditions could have been developed that would have made regulation unnecessary.
- (2) In European Commission, 2003a, Recital 15, the notion of “new and emerging markets” in which market power may be found to exist because of “first-mover” advantages, is not precisely defined. It is not clear whether the term refers to new services, new infrastructures etc. And independently of this, a “first-mover” advantage is never a reason for sector-specific regulation, because it is not an entry barrier (Stigler, 1968, 67-70).

Therefore, it is important to emphasize that there is one consistent theory for localizing network specific market power. Network economics does provide sound economic principles independent of the status of a market, e.g. whether it is an old or an emerging one.

The following conclusions can be drawn:

- (1) If competing infrastructure platforms do exist, sector-specific market power regulation is no longer justifiable. This statement is in accordance with the

first criterion postulated by the EU Commission and can be substantiated by the theory of monopolistic bottlenecks.

- (2) If a bottleneck is not stable for the decision-relevant time horizon, regulation of sector-specific market power should be phased out. This statement is in accordance with the second criterion of the Commission Recommendation, which states that only those markets should be subject to regulation, the structure of which does not tend towards effective competition within the relevant time horizon.
- (3) The essential facilities doctrine is to be applied independent of whether markets are old or new. Concerning this matter, the Access Notice should be kept in mind.
- (4) Sector-specific market power regulation according to the essential facilities doctrine is to be regulated *ex ante*. “Access holidays” are not a solution to regulatory problems, even more so if market power is only postulated and not proved in relation to so called new markets.

Seemingly, what qualifies as a monopolistic bottleneck is still as controversial today, as it was some years ago, when the notion of the bottleneck was generally not limited to monopolistic bottlenecks. Ungerer (2000, p. 235) e.g. showed a table headed “Network Access requirements of Service Providers”, including technical functions of coordination (e.g. numbering schemes).

The question arises whether new markets create new bottlenecks or extend the borderlines of existing bottlenecks. Since there are competing long-distance networks the focus is on network access. In the current debate, the relevancy of one superior fiber-to-the-home network is excluded. Instead, a multiplicity of alternative upgrading strategies seems possible, together with competing infrastructure platforms. The fiber to the “Endverzweiger” upgrading strategy of Deutsche Telekom is only one example (c.f. Büllingen, Stamm, 2001, 61f.).

Competing infrastructure platforms result in monopolistic infrastructure competition. The natural monopoly paradigm disappears and subsequently the need for bottleneck regulation disappears also.

As long as competing network infrastructure does not exist, remaining bottleneck regulation is relevant. However, the borderline of the bottleneck does not expand. There are multiplicities of upgrading strategies based on copper-wired loops as well as based on ductwork etc. Fibre cables similar to DSLAM are part of upgrading infrastructure and do not belong to the remaining bottleneck.

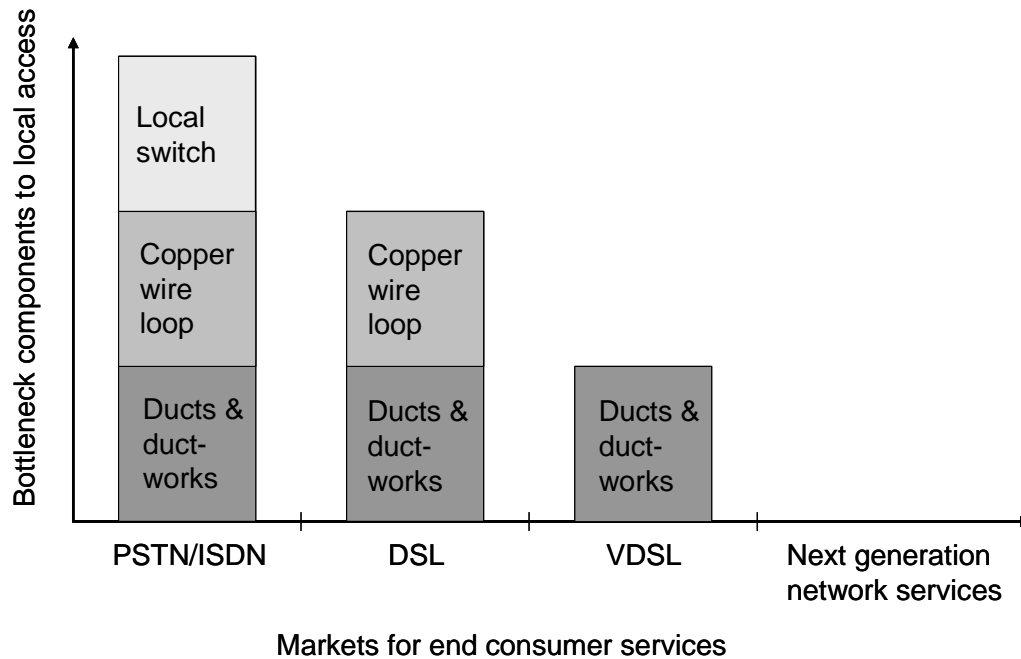
4.2. Platform competition vs. access regulation to ducts

Sector-specific regulation of services lacks any economic basis. Neither old nor new services are a case for sector-specific market power regulation; the question is always whether upstream markets create monopolistic bottlenecks for competitors.

Three kinds of transmission qualities on service markets can be differentiated according to the products provided:

- Narrowband services like PSTN/ISDN, GSM
- Semi high-speed broadband services like broadband internet access up to 6 Mbps download and
- VDSL services up to 50 Mbps

As long as, due to the absence of alternative network infrastructures, a monopolistic bottleneck in den local infrastructure network exists, the question arises what the remaining bottleneck components are for these different markets. In the following we will demonstrate the shrinking-bottleneck hypothesis (see following chart).



For narrowband services like PSTN/ISDN the components belonging to the monopolistic bottleneck are local switch facilities, copper loops, ductworks and ducts.

In order to provide DSL services, local switch facilities are no longer necessary. Access to copper cable is necessary. Competing providers can implement alternative network upgrading strategies, e.g. upgraded copper cable by DSLAMs. Modems etc. are definitely not assets that can be characterized as sunk costs. A parallel investment into modems cannot be considered as socially inefficient cost duplication, because this is the only way to achieve the potentials for a large scope of innovative network services. This is well-known as monopolistic competition.

The provision of VDSL services is not possible without investing into fibre to the curb or fibre to the home. In order to be able to apply upgrading strategies by means of fibre cable, access to ductworks and ducts is necessary. Thus, ex ante regulation of access to ducts and ductworks is required as long as no competing alternative infrastructure is in place. Similar to the situation of competing upgrading strategies by DSLAM on the basis of copper, competing upgrading strategies by means of fibre cables are possible on the basis of ducts and duct-

works. A differentiated unbundling and concomitant cost regulation may be required. “Better regulation”, however, could be seen in an accounting separation regime (e.g. European Commission, 2005) in combination with price cap regulation.

This case is interesting from the point of view of the situation in Switzerland. Almost all Swiss households have a choice between more than one network internet access provider. Access regulation to ducts and ductworks therefore was only implemented based on the revised telecommunications law¹¹ to ensure that access to these facilities is guaranteed in cases where competing infrastructures are not yet in place.

The crucial question is whether there are input markets that an operator needs to have access to in order to deliver services to (end) customers and which are characterized as monopolistic bottlenecks. In a world where several IP-based high-speed platforms are competing, no market power regulation at all will be necessary. Products like IPTV, IP-Telephony, very high-speed internet access etc. are delivered over several different platforms. In this case, if some competitors, due to their path dependency, continue to use an older technology, e.g. PSTN/ISDN, none of these high-tech platform providers should be forced to support this older technology, only to afford their rivals customer access. The entrepreneurial decision to stop offering services based on outdated technologies that some competitors still depend upon may not be impeded by regulators.

It is important to see that the competence for network design should always remain with the network operator. On the basis of the essential facilities doctrine, regulators cannot force a network operator either to build a new network, or to upgrade an established one, or to rebuild a network (e.g. to abrogate switches or copper loops). This shows that the theory of monopolistic bottlenecks is capable of meeting concerns regarding the dynamic development of telecommunications, although the criteria for localizing network-specific market power possess

¹¹ Fernmeldegesetz (FMG), revision of the Swiss Telecommunications Act of March 24, 2006, Art. 11 (1. f.) (<http://www.admin.ch/ch/d/ff/2006/3565.pdf>).

similar validity for other (stationary) network sectors. Criteria for defining where network-specific market power still remains do not depend on the emergence of new markets. Nevertheless, ultimately the market dynamics of service markets will inevitably lead to a shrinking of the monopolistic bottleneck within the local loop.

References

- Areeda, P., Hoverkamp, H. (1988), An Analysis of Antitrust Principles and Their Application, Antitrust Law, 1988/Supp.
- Baake, P., Kamecke, U., Wey, C. (2005), A Regulatory Framework for New and Emerging Markets, Communications and Strategies, No. 60 (4th Quarter), 2005, 123-136.
- Baumol, W.J., Panzar, J.C., Willig, R.D. (1982), Contestable Markets and the Theory of Industry Structure, San Diego.
- Bülligen, F., Stamm, P. (2001), Entwicklungstrends im Telekommunikationssektor bis 2010, Studie im Auftrag des Wirtschaftsministeriums für Wirtschaft und Technologie, Bad Honnef.
- Dahlke, P., Neumann A. (2006), Innovationen und Investitionen durch Regulierung, Telekommunikationsrecht, CR 6/2006, 377-383.
- European Commission (1998), Commission communication concerning the review under competition rules of the joint provision of telecommunications and cable TV capacity over telecommunication networks, OJ C71, 7.3. 1998
- European Commission (2002), Guidelines on market analysis and the assessment of significant market power under the Community regulatory framework for electronic communications network and services, Official Journal of the European Communities, C 165/6-31, 11.7.2002.
- European Commission (2003a), Recommendation of 11 February 2003 on relevant product and service markets within the electronic communications sector susceptible to ex ante regulation in accordance with Directive 2002/21/EC of the European Parliament and of the Council on a common regulatory framework for electronic communication networks and services (2003/311/EC), Official Journal of the European Union, 8.5.2003, L 114/45-49.

- European Commission (2003b), *Electronic Communications: the Road to the Knowledge Economy*, Brussels, 11.2.2003, COM(2003) 65 final.
- European Commission (2005), *Commission Recommendation of 19 September 2005 on accounting separation and cost accounting systems under the regulatory framework for electronic communications (Text with EEA relevance) (2005/698/EC)*, *Official Journal of the European Union*, 11.10.2005, L 266/64.
- Gans, J., King, S. (2003), *Access Holidays for Network Infrastructure Investment*, *Agenda* 10/2, 163-178.
- Knieps, G. (2001), *Regulatory Reform of European Telecommunications: Past Experience and Forward-Looking Perspectives*, *European Business Organization Law Review*, 2, 2001, 641-655.
- Knieps, G. (2005), *Telecommunications markets in the stranglehold of EU regulation: On the need for a disaggregated regulatory contract*, *Journal of Network Industries*, Vol. 6, 2005, S. 75-93.
- Knieps, G. (2006), *Sector-specific market power regulation versus general competition law: Criteria for judging competitive versus regulated markets*, in: Sioshansi, F.P., Pfaffenberger, W. (eds.), *Electricity Market Reform: An International Perspective*, Elsevier, Amsterdam et al., 49-74.
- Lipsky, A.B., Sidak, J.G. (1999), *Essential Facilities*, *Stanford Law Review*, Vol. 51, 1187-1249.
- Stigler, G.J. (1968), *Barriers to Entry, Economies of Scale, and Firm Size*, in: G.J. Stigler, *The Organization of Industry*, Irwin, Homewood, Ill., 67-70.
- Ungerer, H. (2000), *The Case of Telecommunications in the EU*, in: C.-D. Ehlermann, L. Gosling (Eds.), *European Competition Law Annual 1998: Regulating Communications Markets*, Hart Publishing, Oxford and Portland, Oregon, 211-236.

**Als Diskussionsbeiträge des
Instituts für Verkehrswissenschaft und Regionalpolitik
Albert-Ludwigs-Universität Freiburg i. Br.
sind zuletzt erschienen:**

60. **G. Knieps:** Ein analytisches Kostenmodell für das nationale Verbindungsnetz - Referenzdokument - erstellt durch das WIK im Auftrag der Regulierungsbehörde für Telekommunikation und Post: Stellungnahme und Kommentare, Juni 1999
61. **G. Brunekreeft, W. Gross:** Prices for long-distance voice telephony in Germany, erschienen in: Telecommunications Policy, Bd. 24, 2000, 929-945
62. **G. Knieps:** Zur Regulierung monopolistischer Bottlenecks, erschienen in: Wirtschaftspolitisches Forum - Die Liberalisierung des deutschen Telekommunikationsmarktes: Zukünftige Regulierungserfordernisse im Lichte bisheriger Erfahrungen, Zeitschrift für Wirtschaftspolitik, 48. Jahrgang, Heft 3, 1999, S. 297-304
63. **G. Knieps:** Wettbewerb auf dem Mobilfunkmarkt, erschienen in: MultiMedia und Recht (MMR), Beilage 2/2000, S. 1-15
64. **A. Berndt, M. Kunz:** Trassenpreise, InfraCard und Kostendeckung: Diskriminierungsfreier Zugang zum Schienennetz der Deutschen Bahn AG, erschienen in: ifo Studien, Vol. 46, Heft 2/2000, S. 219-248
65. **G. Knieps:** Price Cap als innovatives Regulierungsinstrument in liberalisierten Netzsektoren, erschienen in: Schriftenreihe der Deutschen Verkehrswissenschaftlichen Gesellschaft: Price Cap-Regulierung in Netzindustrien – Chancen und Risiken eines neuen Regulierungsinstruments, Reihe B, B 232, 2000, S. 7-17
66. **G. Knieps:** Rückführung sektorspezifischer Regulierung auf dem deutschen TK-Markt: Die verpaßte Chance des Sondergutachtens der Monopolkommission, erschienen in: MultiMedia und Recht (MMR), 5/2000, S. 266-269
67. **G. Brunekreeft:** Kosten, Körbe, Konkurrenz: Price Caps in der Theorie, erschienen in: Schriftenreihe der Deutschen Verkehrswissenschaftlichen Gesellschaft: Price Cap-Regulierung in Netzindustrien – Chancen und Risiken eines neuen Regulierungsinstruments, Reihe B, B 232, 2000, S. 18-41
68. **A. Gabelmann:** Regulierung auf lokalen Telekommunikationsmärkten: Entbündelter Netzzugang in der Peripherie, April 2000
69. **G. Knieps:** Wettbewerb um Subventionen im Regionalverkehr, erschienen in: A. Obermayr, N. Knoll (Hrsg.), Zukunft der Universaldienstleistungen, Österreichisches Institut für Wirtschaftsforschung (WIFO), Wien, Juli 2000, S. 115-123
70. **G. Knieps:** Marktkonforme Infrastrukturbenutzungsgebühren: Zur Notwendigkeit eines mehrstufigen Tarifkonzepts, erschienen in: Schriftenreihe der Deutschen Verkehrswissenschaftlichen Gesellschaft: Grenzkosten als Grundlage für die Preisbildung im Verkehrsbereich, Reihe B, B 229, 2000, S. 72-80
71. **G. Knieps, H.-U. Küpper und R. Langen:** Abschreibungen bei Preisänderungen in stationären und nicht stationären Märkten, erschienen in: Zeitschrift für betriebswirtschaftliche Forschung (ZfbF), 53, 2001, 759-776

72. **A. Berndt:** Immer Ärger mit den Trassenpreisen?, Vortrag im Rahmen der Mitgliederversammlung der Gesellschaft für Verkehrswissenschaft und Regionalpolitik an der Universität Freiburg im Breisgau am 21.12.2000
73. **G. Brunekreeft:** Price Capping and Peak-Load Pricing in Network Industries, December 2000
74. **G. Brunekreeft:** Regulation and Third-Party Discrimination in Vertically Related Markets; The Case of German Electricity, Revised Version, March 2001
75. **G. Knieps:** Ökonomie der lokalen Netze, erschienen in: Schriftenreihe der Deutschen Verkehrswissenschaftlichen Gesellschaft: Lokale Versorgung im Wettbewerb, Chancen – Risiken – Strategien, Reihe B, B 240, 2001, S. 7-17
76. **G. Knieps:** Netzsektoren zwischen Regulierung und Wettbewerb, erschienen in: H. Berg (Hrsg.), Deregulierung und Privatisierung: Gewolltes – Erreichtes – Versäumtes, Schriften des Vereins für Socialpolitik, Gesellschaft für Wirtschafts- und Sozialwissenschaften, Neue Folge, Band 287, Duncker und Humblot, Berlin, 2002, S. 59-69
77. **Knieps:** Regulatory reform of European telecommunications: Past experience and forward-looking perspectives, erschienen in: European Business Organization and Law Review, Vol. 2, 2001, pp. 641-655
78. **G. Knieps:** Competition in Telecommunications and Internet Services: A Dynamic Perspective, erschienen in: Barfield, C.E., Heiduk, G., Welfens, P.J.J. (eds.), Internet, Economic Growth and Globalization – Perspectives on the New Economy in Europe, Japan and the US, Springer Verlag, Berlin et al., 2003, S. 217-227
79. **G. Knieps:** Strategien zur Vollendung des Binnenmarktes: Liberalisierung der Netzzugänge, erschienen in: Caesar, R., Scharrer, H.-E. (Hrsg.), Der unvollendete Binnenmarkt, Nomos Verlag, Baden-Baden, 2003, S. 201-217
80. **G. Brunekreeft, K. Keller:** Sektorspezifische Ex-ante-Regulierung der deutschen Stromwirtschaft? Oktober 2001
81. **A. Gabelmann:** Regulating European Telecommunications Markets: Unbundled Access to the Local Loop Outside Urban Areas, erschienen in: Telecommunications Policy, 25, 2001, S. 729-741
82. **A. Gabelmann:** Monopolistische Bottlenecks versus wettbewerbsfähige Bereiche im Telekommunikationssektor, Dezember 2001
83. **G. Knieps:** Knappheitsprobleme in Netzen: Was leistet die Ökonomie? erschienen in: Schriftenreihe der Deutschen Verkehrswissenschaftlichen Gesellschaft: Knappe Netzkapazitäten – Probleme und Lösungsstrategien in offenen Verkehrs- und Versorgungsnetzen, Reihe B, B 252, 2002, S. 7-22
84. **G. Knieps:** Wholesale/retail pricing in telecom markets, erschienen in: Contributions to the WIK Seminar on „Regulatory Economics“, Königswinter, 19-21 November 2001, Bad Honnef, 2002, S. 9-20
85. **G. Knieps:** Wettbewerb auf den Ferntransportnetzen der deutschen Gaswirtschaft: Eine netzökonomische Analyse, erschienen in: Zeitschrift für Energiewirtschaft (ZfE) 26/3, 2002, S. 171-180

86. **G. Knieps:** Entscheidungsorientierte Ermittlung der Kapitalkosten in liberalisierten Netzindustrien, erschienen in: Zeitschrift für Betriebswirtschaft (ZfB), 73. Jg., Heft 9, 2003, S. 989-1006
87. **G. Knieps:** Costing und Pricing in Netzindustrien, erschienen in: Schriftenreihe der Deutschen Verkehrswissenschaftlichen Gesellschaft: Investitionsentscheidungen und Kostenmanagement in Netzindustrien, Reihe B, B 262, 2003, S. 7-25
88. **G. Knieps:** Does the system of letter conveyance constitute a bottleneck resource? erscheint in: Proceedings of the 7th Königswinter Seminar „Contestability and Barriers to Entry in Postal Markets“, November 17-19, 2002
89. **G. Knieps:** Preisregulierung auf liberalisierten Telekommunikationsmärkten, erschienen in: Telekommunikations- & Medienrecht, TKMR-Tagungsband, 2003, S. 32-37
90. **H.-J. Weiß:** Die Doppelrolle der Kommunen im ÖPNV, erschienen in: Internationales Verkehrswesen, Jg. 55 (2003), Nr. 7+8 (Juli/Aug.), S. 338-342
91. **G. Knieps:** Mehr Markt beim Zugang zu den Start- und Landerechten auf europäischen Flughäfen, erschienen in: Orientierungen zur Wirtschafts- und Gesellschaftspolitik 96, Juni 2003, S. 43-46
92. **G. Knieps:** Versteigerungen und Ausschreibungen in Netzsektoren: Ein disaggregierter Ansatz, erschienen in: Schriftenreihe der Deutschen Verkehrswissenschaftlichen Gesellschaft: Versteigerungen und Ausschreibungen in Verkehrs- und Versorgungsnetzen: Praxiserfahrungen und Zukunftsperspektiven, Reihe B, B 272, 2004, S.11-28
93. **G. Knieps:** Der Wettbewerb und seine Grenzen: Netzgebundene Leistungen aus ökonomischer Sicht, erschienen in: Verbraucherzentrale Bundesverband (Hrsg.), Verbraucherschutz in netzgebundenen Märkten – wieviel Staat braucht der Markt?, Dokumentation der Tagung vom 18. November 2003, Berlin, 2004, S. 11-26
94. **G. Knieps:** Entgeltregulierung aus der Perspektive des disaggregierten Regulierungsansatzes, erschienen in: Netzwirtschaften&Recht (N&R), 1.Jg., Nr.1, 2004, S. 7-12
95. **G. Knieps:** Neuere Entwicklungen in der Verkehrsökonomie: Der disaggregierte Ansatz, erschienen in: Nordrhein-Westfälische Akademie der Wissenschaften (Hrsg.), Symposium „Transportsysteme und Verkehrspolitik“, Vorträge 17, Schöningh-Verlag, Paderborn, 2004, S. 13-25
96. **G. Knieps:** Telekommunikationsmärkte zwischen Regulierung und Wettbewerb, erschienen in: Nutzinger, H.G. (Hrsg.), Regulierung, Wettbewerb und Marktwirtschaft, Festschrift für Carl Christian von Weizsäcker, Verlag Vandenhoeck & Ruprecht, 2003, S. 203-220
97. **G. Knieps:** Wettbewerb auf den europäischen Transportmärkten: Das Problem der Netzzugänge, erschienen in: Fritsch, M. (Hrsg.), Marktdynamik und Innovation – Gedächtnisschrift für Hans-Jürgen Ewers, Duncker & Humblot, Berlin, 2004, S. 221-236
98. **G. Knieps:** Verkehrsinfrastruktur, erschienen in: Akademie für Raumforschung und Landesplanung (Hrsg.), Handwörterbuch der Raumordnung, Hannover 2005, S. 1213-1219

99. **G. Knieps:** Limits to the (De-)Regulation of Transport Services, erschienen als: "Delimiting Regulatory Needs" in: OECD/EMCT Round Table 129, Transport Services: The Limits of (De)regulation, OECD Publishing, Paris, 2006, S.7-31
100. **G. Knieps:** Privatisation of network industries in Germany –A disaggregated approach – erscheint in: Köthenbürger, M., Sinn, H.-W., Whalley, J. (eds.), "Privatization Experiences in the European Union", CESifo Seminar Series, MIT Press, 2006
101. **G. Knieps:** Competition in the post-trade markets: A network economic analysis of the securities business, erschienen in: Journal of Industry, Competition and Trade, Vol. 6, No.1, 2006, S. 45-60
102. **G. Knieps:** Information and communication technologies in Germany: Is there a remaining role for sector specific regulations?, erscheint in: Moerke, A., Storz, C. (Hrsg.), Institutions and Learning in New Industries, RoutledgeCurzon, 2006
103. **G. Knieps:** Von der Theorie angreifbarer Märkte zur Theorie monopolistischer Bottlenecks, November 2004, revidierte Fassung: Juni 2005
104. **G. Knieps:** The Different Role of Mandatory Access in German Regulation of Railroads and Telecommunications, erschienen in: Journal of Competition Law and Economics, Vol. 2/1, 2006, S. 149-158
105. **G. Knieps:** Aktuelle Vorschläge zur Preisregulierung natürlicher Monopole, erschienen in: K.-H. Hartwig, A. Knorr (Hrsg.), Neuere Entwicklungen in der Infrastrukturpolitik, Beiträge aus dem Institut für Verkehrswissenschaft an der Universität Münster, Heft 157, Vandenhoeck & Ruprecht, Göttingen, 2005, S. 305-320
106. **G. Aberle:** Zukünftige Entwicklung des Güterverkehrs: Sind Sättigungsgrenzen erkennbar? Februar 2005
107. **G. Knieps:** Versorgungssicherheit und Universaldienste in Netzen: Wettbewerb mit Nebenbedingungen? erschienen in: Schriftenreihe der Deutschen Verkehrswissenschaftlichen Gesellschaft: Versorgungssicherheit und Grundversorgung in offenen Netzen, Reihe B, B 285, 2005, S. 11-25
108. **H.-J. Weiß:** Die Potenziale des Deprival Value-Konzepts zur entscheidungsorientierten Bewertung von Kapital in liberalisierten Netzindustrien, Juni 2005
109. **G. Knieps:** Telecommunications markets in the stranglehold of EU regulation: On the need for a disaggregated regulatory contract, erschienen in: Journal of Network Industries, Vol. 6, 2005, S. 75-93
110. **H.-J. Weiß:** Die Probleme des ÖPNV aus netzökonomischer Sicht, August 2005
111. **G. Knieps:** Die LKW-Maut und die drei Grundprobleme der Verkehrsinfrastrukturpolitik, erschienen in: Schriftenreihe der Deutschen Verkehrswissenschaftlichen Gesellschaft: Die LKW-Maut als erster Schritt in eine neue Verkehrsinfrastrukturpolitik, Reihe B, B 292, 2006, S. 56-72
112. **C.B. Blankart, G. Knieps, P. Zenhäusern:** Regulation of New Markets in Telecommunications? Market dynamics and shrinking monopolistic bottlenecks, Paper to be presented at the 17th European Regional ITS Conference, August 22-24, 2006, in Amsterdam