

Knieps, Günter

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The Net Neutrality Debate and the German Communications and Competition Law

by Günter Knieps

Discussion Paper

Institut für Verkehrswissenschaft und Regionalpolitik

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Abstract:

A common denominator of network neutrality definitions is a plea against traffic shaping within the Internet and the resultant challenge to the traditional 'best effort' transmission. By means of access regulation of local loop bottleneck components the transfer of market power from the telecommunications network bottleneck components into the complementary Internet access service markets can be avoided. Regulation between access service providers and Internet application service providers is not justified. The avoidance of network neutrality regulation is of importance, because only then can the adequate market signals (congestion tariffs, quality differentiations etc.) be supplied to the content provider, leading to a more efficient exploitation of the Internet traffic resources.

Prof. Dr. Günter Knieps
Institut für Verkehrswissenschaft und Regionalpolitik
Universität Freiburg
Platz der Alten Synagoge, 79085 Freiburg i. Br.
Phone: (+49) - (0)761 - 203 - 2370
Fax: (+49) - (0)761 - 203 - 2372
e-mail: guenter.knieps@vwl.uni-freiburg.de

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1. Introduction

The role of government interventions and regulations has different traditions in the media, information technologies (IT) and telecommunications sectors. The media industry, for example, has traditionally been viewed as a bearer of social, cultural and ethical values within society. As such, the media has historically been subjected to federal regulation to some extent, e.g. public broadcasting. Federal intervention in private communication in most western, industrialized countries, on the other hand, has been largely absent, as it has generally been in the computer and IT industry as well. In Europe, the computer and IT industry has been allowed to develop in an unregulated manner for the most part under the general competition law.

Several authors have raised questions along these lines with regard to the Internet. Mestmäcker (2001), for example, asks whether content will still be subject to regulation in the future considering the enormous scope of content production and distribution in the converging markets. Fisher (2000) and others wonder whether there is still a serious applications barrier to entry in the microprocessor market, given the enormous potential for middleware threats due to innovations on the browser market. Kesan and Shah (2001) make an attempt to identify the potential and the limits to self-regulation in the organization of access to Internet Protocol (IP) number assignments and domain name systems, while Müller and Rannenbergh (1999) question the safety of the Internet. These highly relevant and pertinent questions, however, will not be addressed here, because the focus of this paper is on the issue of broadband convergence and quality of service differentiation of Internet data transport.

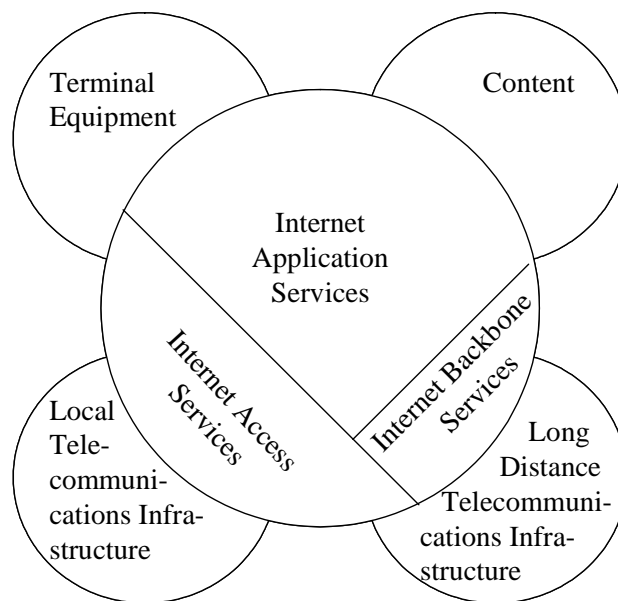
2. Broadband convergence and quality of service differentiation

2.1 The role of telecommunications for Internet Traffic

The provision of Internet data transport requires Internet access services as well as Internet backbone services. Both Internet traffic services are based on tele-

communications capacities, combined with Internet logistics. Telecommunications capacities are produced by local telecommunications infrastructure and long-distance telecommunications infrastructure. Complementary to Internet traffic services several application services are provided. Internet application service providers offer their customers a wide spectrum of different services by combining both peripheral and main elements (see Figure 1).

Figure 1: Internet and Internet periphery



Source: Knieps, Zenhäusern (2008, p. 122)

Terminal equipment (e.g. PCs and cellular phones) can be used either with or without access to the Internet, although obviously the use of the Internet is not possible without any terminal equipment. Content may be provided via the Internet (e.g. video on demand, customized music and video libraries), but it is also available through other distribution channels, such as cinemas, traditional video libraries and traditional broadcasting. Internet service provision would be possible without any sort of content provision (e.g. Knieps, 2003, pp. 217 ff.).

2.2 Quality of service (QoS) and the development of the smart Internet

In its origins, the Internet was based on narrowband local telecommunications infrastructure, and thus was basically a transport medium for e-mails. At that time the Internet was relatively new to market players, and terminal equipment as well as content was not primarily designed for interacting with the Internet. Telecommunications networks originally were not constructed for Internet purposes either. Network Internet intelligence was basically located at the edges, not at the core of the Internet. The task of the routers was to simply forward data packages, without differentiation between services or applications. Within the Internet, all traffic was treated equally, meaning non-discriminatorily, between different services and customers. The traffic principle was “first in, first out”. Thus, the traditional IPv4 Internet is characterised by best-effort homogeneous transportation quality. All data packets are forwarded by the routers with the same priority. No quality differentiation of packets transport does exist.

Convergence of the telecommunications, media and information technology sectors has been increasing in recent years with the emergence of the Internet and with the increasing capability of existing networks to carry both telecommunications and broadcasting services. Developments in digital technologies and software are creating large innovative technological potential for the production, distribution and consumption of information services. Convergence, characterised as the ability of different network platforms to carry essentially similar kinds of services, may have different faces: telecommunications operators may offer audio-visual programming over their network, broadcasters may provide data services over their networks, cable operators may provide a range of telecommunication services.

The Internet as the prime driver of convergence is displacing traditional isolated computer networks, it is providing an alternative means of offering telecommunication services (e.g. Internet telephony), and, moreover, the Internet is also becoming a significant platform for broadcasting services. In addition, technological convergence makes possible innovative services which combine product characteristics from the traditionally distinct branches of telecommunications, IT

and the media, thereby enlarging the scope of voice, data, multimedia and audio-visual services.

The best effort routing of the traditional Internet, by means of the Transmission Control Protocol / Internet Protocol (TCP / IP), is challenged by the emergence of heterogeneous applications services, like Internet telephony, interactive video gaming, large volume music exchange services etc. Consequently, traffic quality differentiation addressing delay, delay variation (jitter), and packet loss becomes increasingly important. Whereas interactive applications are very delay and jitter sensitive, e-mail services or the download of documents is typically less delay sensitive.

Within the differentiated services (Diff Serv/DS) concept of QoS differentiation traffic classification as well as traffic conditioning is of importance. Within traffic classification data packets are classified into ex ante defined number of classes without the use of any end to end signalling protocols. All data packets within the premium class are transported more rapid and more reliable than the data packets of lower classes. Quality classes are monotone with respect to transport quality (e.g. Jin, Jordan, 2005, p. 842). “Intelligent” routers have the task of packet classification and conditioning according to defined QoS classes. Within Diff Serv a hierarchy of routers is implemented. Only access routers respectively edge routers classify the packets and condition the traffic. The routers within the Internet backbone (core routers) only deal with aggregation of traffic to perform scheduling and buffer management (e.g. Liakopoulos et al., 2004; Chen, Zhang, 2004, pp. 371 ff.).

3. Telecommunications regulation and the net neutrality debate

3.1 The net neutrality debate in Germany and Europe

Relating to the notion of network neutrality, it “has been used to describe a data network that assigns all transmissions equal priority as they are passed along the network” (OECD, 2006, p. 3). In this respect it is a “call for regulatory limita-

tions on network owners' ability to discriminate against particular content, applications, and devices" (Yoo, 2006, p.1850). A common denominator of network neutrality definitions is a plea against traffic shaping within the Internet and the resultant challenge to the traditional 'best effort' transmission (e.g. Knieps, Vogelsang, 2007, pp.105 ff.).

The role of market power in future Internet traffic organisation is considered to be of significant relevance. Internet application providers (e.g. Google, Yahoo etc.) have worried that in the absence of network neutrality they might face higher prices or degraded services (e.g. Hogendorn, 2007). The focus of the debate is on whether Internet application providers should be protected from the abuse of market power of Internet access providers (e.g. Economides, 2007, p. 8). Therefore, the network neutrality debate centres on private and social incentives for traffic shaping and the impact of the supposed market power involved. This may include the statutory prohibition of blockage of content or applications ("port blocking"), meaning that Internet access service providers can deny customers access even to lawful content. Furthermore net neutrality regulation may include agreements between the providers of Internet access services and providers of Internet application services (e. g. Internet content delivery services) taking into account different traffic qualities and congestion management, as well as vertical integration of Internet access service providers into the production of Internet content or other application services (e.g. Knieps, Zenhäusern, 2008, p. 120).

3.2 Regulatory arrangements for communication services

Despite the fact that the telecommunications sector is fully liberalized in Germany – as well as in all other European countries – it is still characterized by a complex set of sector-specific regulations today.

The basic goal of the 1999 Review of the European Commission (European Commission 1998) was to consider the extent to which phasing out sector-specific market power regulation should take place. The key objectives stated at

the beginning of the review process were: (1) to maximize the application of the general European competition law; (2) to minimize sector-specific regulation; and (3) to rigorously phase out unnecessary regulation (European Commission 1998, p. 3).

On 12 July 2000, the European Commission presented its ‘1999 Review Package’, which included five proposals for Directives of the European Parliament and the Council, and one proposal for a Regulation. Since then, the following directives have been enacted: an ONP Framework Directive,¹ an Access and Interconnection Directive,² a Licensing Directive,³ a Universal Service Directive,⁴ a Personal Data/Protection of Privacy Directive.⁵ In addition, the proposal for the regulation of unbundled access to the local loop was passed by the European Parliament and the Council, and enacted in January 2001.⁶ This regulation marks a first for the EU, as the legal instrument of a regulation has never been used before in telecommunications policy. In contrast to a Directive, which requires national legislative enactment measures, a Regulation is the most power-

¹ 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), Official Journal of the European Communities L108/33, 24 April 2002.

² 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), Official Journal of the European Communities L108/7, 24 April 2002.

³ Directive 2002/20/EC of the European Parliament and of the Council of 7 March 2002 on the authorization of electronic communications networks and services (Authorization Directive), Official Journal of the European Communities L108/21, 24 April 2002.

⁴ Directive 2002/22/EC of the European Parliament and of the Council of 7 March 2002 on universal service and users’ rights relating to electronic communications networks and services (Universal Service Directive), Official Journal of the European Communities L108/51, 24 April 2002.

⁵ Directive 2002/58/EC of the European Parliament and of the Council of 12 July 2002 concerning the processing of personal data and the protection of privacy in the electronic communications sector (Directive on privacy and electronic communications), Official Journal of the European Communities L201/37, 31 July 2002.

⁶ Regulation (EC) No 2887/2000 of the European Parliament and of the Council of 18 December 2000 on unbundled access to the local loop, Official Journal of the European Communities L336/4, 30 December 2000.

ful legislative tool made available by the EC Treaty. It is binding in its entirety and directly applicable in all Member States, meaning that it automatically becomes law in all Member States as soon as it is enacted.⁷

According to this regulation, the incumbent operator with significant market power is obliged to provide full, unbundled access, as well as shared access, to the copper local loop under transparent, fair and non-discriminatory conditions. The implementation of price regulation is left to the national regulatory authorities. As long as the level of competition for local access is insufficient to prevent excessive pricing, national regulatory authorities are required to ensure that the principle of cost orientation is applied.

Both the Framework Directive and the Access Directive provide no clear-cut definition of future sector-specific regulation. The Framework Directive provides a new interpretation of the criterion 'considerable market power', moving in the direction of establishing the criterion of dominance in a given market as a prerequisite for sector-specific market power regulation. It gives the Commission discretionary power to identify a variety of markets for which the introduction of sector-specific regulatory measures should at least be considered. The Access Directive already indicates that sector-specific regulation may be extended to competitive markets (e.g. mobile telephony) as well as newly developing innovative markets (e.g. the Internet).⁸

In Germany, the telecommunications law of 25 July 1996 has allowed global market entry since January 1998.⁹ The EU review process spurred on a review of the national communications law in Germany, which was finally revised in June 2004.¹⁰ The question thus arises as to whether additional sector-specific

⁷ This does not rule out the fact that directives may have direct effect in Member States, provided that the provisions of the directive are sufficiently precise and unconditional.

⁸ Legislative reform proposals to amend the regulatory framework covers changes to the Universal Service Directive (COM (2007) 698 final), as well as reform proposals to the Framework and Access Directives (COM (2007) 697).

⁹ Telekommunikationsgesetz (TKG) vom 25. Juli 1996 (BGBl. I S.1120)

¹⁰ Telekommunikationsgesetz (TKG) vom 22. Juni 2004, (BGBl. I S. 1190)

regulations now in place will be removed, or whether there is still a role for sector-specific regulations.

3.3 The disaggregated regulatory approach

Criteria such as relative market share, financial strength and access to input and service markets can only serve as a starting point for evaluating the existence of market power. ‘Criteria for conjecturing a dominant position’ (“Vermutungskriterien”) on the basis of market shares, for example, can lead to economically unjustified criteria for government intervention in network industries. From a competition economics point of view, the use of ex ante, sector-specific regulatory intervention constitutes massive interference with the market process and thus always requires a particularly well-founded justification based on modern network economics.¹¹ Obviously, the development of an ex ante regulatory criterion creates a need for a more clear-cut definition of market power.

It is necessary to differentiate between those areas in which active and potential competition can work and other areas, so-called monopolistic bottleneck areas. The theory of monopolistic bottlenecks is based on a strict application of Stigler’s concept of barriers to entry in order to identify network-specific market power. Stigler’s concept of entry barriers, which focuses on long-term cost asymmetries between incumbent and potential entrants, is essential here to identify a proper regulatory basis (Stigler, 1968, p. 67). The conditions for a monopolistic bottleneck facility are fulfilled if the facility is necessary for reach-

¹¹ The traditional methods and approaches in general competition law, both with respect to merger control and the control of abusive practices, are fundamentally different from those of sector-specific, regulatory economics. Any mingling of these two different approaches is misleading. The paper examines the question of a sector-specific need for regulation and thus does not comment on merger cases. Market shares and turnover are easily measurable and are therefore usually taken up as criteria in competition law. However, they must not in any way be confused with a sound economic analysis of the effectiveness of active and potential competition. When examining a merger case, the competition authorities use a large number of criteria to which they attach, by their own discretion, a varying degree of significance on a case-by-case basis. For the general control of abusive practices, as well, competition law envisions a correction of market processes on a case-by-case basis.

ing consumers, that is, if no second or third such facility exists, i.e. if there is no active substitute available. This is the case if there is, due to economies of scale and economies of scope, a natural monopoly situation, so that one supplier can provide this facility at a lesser cost than several suppliers. And furthermore, if at the same time the facility cannot be duplicated in an economically feasible way, that is, if no potential substitute is available. This is the case if the costs of the facility are irreversible (c.f. Knieps, 1997).

Thus, the 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 as in the other sectors of an economy. The role of competition is by no means confined to potential competition. Both active and potential competition with technological differentiation as well as product differentiation and innovation (of both products and processes) constitute potential parameters of effective competition. Service networks due to the absence of irreversible costs unquestionably have non-bottleneck character; they may or may not possess the characteristics of a natural monopoly. When establishing proof that a facility is a monopolistic bottleneck, it is crucial to concentrate exclusively on those network areas where there is a lack of active as well as potential competition and, consequently, no economically feasible alternative network access on the downstream markets. For instance, if a service network provider can choose between alternative network infrastructure providers, there is no monopolistic bottleneck, even if the infrastructures in question are not identical but, in accordance with the theory of monopolistic competition, characterised by product/technology differentiation (Knieps, 2006, pp. 53 ff.).

4. Lessons for the net neutrality debate

The transport of data packages belongs to the markets for Internet transport services. Due to the absence of irreversible cost providing Internet logistic, they do not possess the characteristics of monopolistic bottlenecks. However, Internet traffic services are based on telecommunications capacities. Insofar as the markets for telecommunications capacities have monopolistic bottleneck compo-

nents, regulation may be necessary to guarantee competitive markets for traffic services.

Since the markets for long-distance telecommunications infrastructure capacities are competitive, the markets for Internet backbone services also are competitive. However, local telecommunications infrastructure capacities may possess the characteristics of monopolistic bottlenecks for which neither active nor potential substitutes are available. The EU regulation on unbundled access to the local loop proceeded from this assumption and concluded that there is still a need to regulate an incumbent operator's local access network.

In Germany increasing competition within local telecommunications infrastructures (local loops) can be observed. Competition has led to considerable variety in technological platforms, e.g. optical fiber, wireless networks, Community Antenna Television (CATV) networks and satellite technology, as well as to an increase in product variety. In addition, because of these rapid developments, the local loop facilities in larger cities and agglomerations in Germany are increasingly losing their status as monopolistic bottlenecks. Although it is not possible at this point to predict exactly how long it will take for the monopolistic bottlenecks in the local loop to disappear completely, it is clear that the building of access networks parallel to monopolistic bottlenecks, which was until only recently considered a futuristic dream, is now in full swing. The development of alternative access networks indicates that the potential for phasing out sector-specific regulation in telecommunications is strongly increasing (e.g. Blankart, Knieps, Zenhäusern, 2007).

To the extent that local networks constitute monopolistic bottlenecks, ex ante regulation appears justified. Since unregulated tariffs would enable owners of monopolistic bottlenecks to generate excessive profits, the instrument of price-cap regulation should be introduced. It is important to restrict such price-cap regulation to those areas of telecommunications networks where market power due to monopolistic bottlenecks is a regulatory problem. In all other subparts of telecommunications networks, price setting should be left to competitive market forces.

By means of access regulation of local loop bottleneck components the transfer of market power from the telecommunications network bottleneck components into the complementary Internet access service markets can be avoided. Regulation between access service providers and Internet application service providers is not justified. The avoidance of network neutrality regulation is of importance, because only then can the adequate market signals (congestion tariffs, quality differentiations etc.) be supplied to the content provider, leading to a more efficient exploitation of the Internet traffic resources.

References

- Blankart, Ch.B., Knieps, G., Zenhäusern, P. (2007), Regulation of New Markets in Telecommunications: Market Dynamics and Shrinking Monopolistic Bottlenecks, *European Business Organization Law Review (EBOR)*, 8, pp. 413-428
- Chen, Jyh-Cheng, Zhang, Tao (2004), *IP-Based Next-Generation Wireless Networks: Systems, Architectures, and Protocols*, John Wiley & Sons
- Economides, N. (2007), Net Neutrality, Non-Discrimination and Digital Distribution of Content Through the Internet, AEI-Brookings Joint Centre for Regulatory Studies, related publication 07-07, Washington
- European Commission (1998), Directorate General XIII ONP COMMITTEE, Subject: The 1999 Review of the Telecommunications Regulatory Framework, ONP COM 98-42, Brussels, 11 September
- Fisher, F.M. (2000), The IBM and Microsoft cases: what's the difference?, *American Economic Review, Papers & Proceedings*, 90, pp. 180-183
- Hogendorn, C. (2007), Broadband Internet: Net Neutrality versus Open Access, Special Issue on Digital Economy and Regulatory Issues, edited by G. Knieps and I. Vogelsang, *Journal of International Economics and Economic Policy*, 4/2, pp. 185-208
- Jin, N., Jordan, S. (2005), Information exchange in diffServ pricing, *IEEE Globecom 2005 proceeding*, pp. 841-846

- Kesan, J.P., Shah, R.C. (2001), Fool Us Once Shame On You – Fool Us Twice Shame On Us: what we can learn from the privatizations of the internet backbone network and the domain name system, Law and Economics Working Paper no. 00-18, University of Illinois College of Law, Urbana Champaign
- Knieps, G. (1997), Phasing out Sector-Specific Regulation in Competitive Telecommunications, *Kyklos*, 50/3, pp. 325-339
- Knieps, G. (2003), Competition in Telecommunications and the Internet Services: A Dynamic Perspective, 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., pp. 217-227
- 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., 2006, pp. 49-74
- Knieps, G., Vogelsang, I. (2007), Digital Economy and Regulatory Issues. Introduction, *International Economics and Economic Policy*, 4, pp.101-107
- Knieps, G., Zenhäusern, P. (2008), The fallacies of network neutrality regulation, *Competition and Regulation in Network Industries*, Vol 9/2, pp. 119-134
- Liakopoulos, A., Maglaris, B., Bouras, C., Sevasti, A. (2004), Providing and verifying advanced IP services in hierarchical DiffServ networks – the case of GEANT, *International Journal of Communication Systems* 17/4, S. 321-336
- Mestmäcker, E.-J. (2001), Unternehmenskonzentrationen und Urheberrechte in der alten und “neuen” Musikwirtschaft, *Zeitschrift für Urheber- und Medienrecht (ZUM)*, 3, pp. 185-194
- Müller, G., Rannenber, K. (1999), *Multilateral Security in Communications-Technology, Infrastructure, Economy*, Munich, Addison-Wesley-Longman

OECD (2006), Internet Neutrality: A Policy Overview, OECD Working Party on Telecommunication and Information Services Policies, OECD Report, DSTI/ICCP/TISP(2006)4/FINAL, May, pp. 29-30, Dublin

Stigler, G.J. (1968), Barriers to entry, economies of scale, and firm size, in G.J. Stigler, *The Organization of Industry*, reprint, pp. 67-70, Chicago, University of Chicago Press

Yoo, C. S. (2006), Network Neutrality and the Economics of Congestion, *The Georgetown Law Journal*, 94, pp.1847-1908

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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? erschienen in: G. Kulenkampff, A. Niederprüm (eds.), Contestability and Barriers to Entry in Postal Markets, Wissenschaftliches Institut für Infrastruktur und Kommunikationsdienste, Bad Honnef, 2006, S. 9-22
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, erschienen in: Köthenbürger, M., Sinn, H.-W., Whalley, J. (eds.), Privatization Experiences in the European Union, MIT Press, Cambridge (MA), London, 2006, S. 199-224
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?, erschienen in: Moerke, A., Storz, C. (Hrsg.), Competitiveness of New Industries. Institutional Framework and learning in information technology in Japan, the US and Germany, Routledge, London, New York, 2007, S. 57-73
103. **G. Knieps:** Von der Theorie angreifbarer Märkte zur Theorie monopolistischer Bottle-necks, in: Daumann, F., Okruch, S., Mantzavinos, C. (Hrsg.), Wettbewerb und Gesundheitswesen: Konzeptionen und Felder ordnungsökonomischen Wirkens, Festschrift für Peter Oberender, Andrassy Schriftenreihe, Bd. 4, Budapest 2006, S. 141-159
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, erschienen in: Lasch, Rainer/Lemke, Arne (Hrsg.), Wege zu einem zukunftssträchtigen ÖPNV: Rahmenbedingungen und Strategien im Spannungsfeld von Markt und Politik, Erich Schmidt Verlag, Berlin, 2006, S. 119-147
- 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, erschienen in: European Business Organization Law Review (EBOR), Vol. 8, 2007, S. 413-428
- 113. G. Knieps:** Wettbewerbspotenziale im Nahverkehr: Perspektiven und institutionelle Barrieren, erschienen in: Schriftenreihe der Deutschen Verkehrswissenschaftlichen Gesellschaft: Warten auf Wettbewerb: ÖPNV in Deutschland, Reihe B, 2007, S. 11-23
- 114. F. Birke:** Universaldienstregulierung in der Telekommunikation heute: Herausforderungen, Chancen und Risiken – Ein historischer Ansatz, Mai 2007
- 115. G. Knieps, P. Zenhäusern:** The fallacies of network neutrality regulation, erschienen in: Competition and Regulation in Network Industries, Vol 9/2, 2008, S. 119-134
- 116. G. Knieps:** Disaggregierte Regulierung in Netzsektoren: Normative und positive Theorie, erschienen in: Zeitschrift für Energiewirtschaft, 31/3, 2007, S. 229-236
- 117. G. Knieps, H.-J. Weiß:** Reduction of Regulatory Risk: A Network Economic Approach, erscheint in: Tagungsband zur Konferenz über Regulierungsrisiken in Halle, März 2007, Nomos Verlag
- 118. G. Knieps, H.-J. Weiß:** Regulatory Agencies and Regulatory Risk, Revised Version: January 2008
- 119. G. Knieps:** Regulatorische Entbündelung in Netzindustrien, erschienen in: Tagungsbände der Gesellschaft für Verkehrswissenschaft und Regionalpolitik an der Universität Freiburg e.V., 40. Freiburger Verkehrsseminar 2007, Entbündelung in Netzindustrien: Chancen und Risiken, Freiburg, S. 11-25
- 120. G. Knieps:** The Net Neutrality Debate and the German Communications and Competition Law, erscheint in: Proceedings of the 3rd Annual International Conference on „Net Neutrality“, Center for Law and Public Utilities, Seoul National University, 17 October 2008