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Competition, Regulation and Privatisation: The Railroads and Telecommunications Network Industries in Germany

by Günter Knieps

Discussion Paper

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Abstract:

In this paper we compare the privatisation and deregulation experience of German railroads with the telecommunications sector. In section 2 the period of nationalisation, legal entry barriers and self-regulation for the German railroad and the telecommunications sector is characterized. Section 3 is devoted to the privatisation and entry deregulation during the German telecommunications reform as well as the German railroad reform. In section 4 the need for a sector-symmetric regulatory approach is derived, with particular emphasis on the phasing-out potentials of sector specific regulation. It is shown that the problem of non-discriminatory access has to be solved with respect of the railway infrastructure as a whole, whereas in telecommunications only the local loop may create a remaining regulatory problem.

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1. Introduction

Although the term privatisation has been used in different ways (e.g. Thiemeyer, 1986, pp. 7-10), its most common use is the sale of publicly owned assets (e.g. Kay, Thompson, 1986). Thus, privatisation focuses on the introduction of the monitoring effects of the capital market, such that the threat of bankruptcy or take-over may increase if the level of firm efficiency is declining. There exists a considerable amount of literature, comparing the relative efficiency of private and state-owned enterprises (public enterprises) in many sectors of the economy, such as garbage collection, health service, financial services, fire brigades, different modes of transport services (road transport, rail transport, air transport and shipping), energy production and distribution, and water generation and distribution etc.¹ This literature is rather controversial on the question, whether private firms are in every case more efficient than public-owned firms. It has been argued that a mere transfer from state monopoly to private monopoly would not seem to be sufficient to guarantee efficiency. The implications of the property rights theory have shown that a private firm which has market power will have significant freedom to pursue alternative goals and to behave inefficiently. Its managers too may seek to increase the scale of their operations or to minimise the degree of change to their customary working practices. According to Pommerehne (1990, pp. 45ff.), larger efficiency gains can only be expected if privatisation is complemented with market liberalisation, whereas mere privatisation in a non-competitive environment does not promise a significant efficiency gain.

In this paper we compare the privatisation and deregulation experience of German railroads with the telecommunications sector for several reasons: Both sectors have experienced a long period of public enterprise in contrast to, for example, the energy sector, which has a long tradition of private firms. Whereas the railroad sector still has significant subsidy requirements, telecommunications networks are profitable in nature.

¹ A survey of this large amount of studies is provided in Pommerehne, 1990, table 1, pp. 34-37.

Network industries can be differentiated in network services and complementary network infrastructure. Whereas network services can be provided efficiently in competitive markets without market regulation, the provision of network infrastructures does require sector-specific regulation. To the extent that network infrastructures have the characteristics of a monopolistic bottleneck (natural monopoly in combination with irreversible costs), non-discriminatory access has to be guaranteed, otherwise competition on the complementary service markets is hampered or becomes completely impossible (e.g., Knieps, 2001).

The period of nationalisation has been complemented with legal entry barriers, protecting the state-owned enterprises globally (end-to-end), including network infrastructures as well as network services. At the same time network industries were mainly self-regulated. Since the privatisation debate in Germany (as well as in other European countries) has been strongly motivated by the attempt to introduce competition on the network service level, it has been complemented with entry deregulation and the introduction of sector-specific regulation of network access. The major success of privatisation has not been due to the transfer from state-owned to private firms, but to the entry deregulation of the network industries. Although the necessity of sector-specific regulation instead of self-regulation has in the meantime been increasingly recognised, the design and implementation of proper regulation of network access is still an important area of future institutional reform in network industries. For this purpose it seems of particular importance that the chosen case studies (telecommunications and railroad systems) point out the importance of variety and search for new solutions on the network service level which can most successfully be found by means of active and potential competition. While competition plays an important role for telecommunications infrastructure (e.g. Sidak, Engel, Knieps (eds.), 2001), railway infrastructure remains a long-lasting monopolistic bottleneck. As a consequence, forward-looking perspectives regarding the potential for the phasing out of sector-specific regulation remain quite different for telecommunications as compared to the railroad sector.

The paper is organized as follows: In section 2 the period of nationalisation, legal entry barriers and self-regulation for the German railroad and the telecom-

munications sector is characterized. Section 3 is devoted to the privatisation and entry deregulation during the German telecommunications reform as well as the German railroad reform. In section 4 the need for a sector-symmetric regulatory approach is derived, with particular emphasis on the phasing-out potentials of sector-specific regulation. It is shown that the problem of non-discriminatory access has to be solved with respect of the railway infrastructure as a whole, whereas in telecommunications only the local loop may create a remaining regulatory problem.

2. The period of nationalisation, legal entry barriers and self-regulation

2.1 From private firms to a nationalised industry – The case of Prussian Railway system

Since privatisation is the partial or total transfer of an enterprise from public to private ownership, it is the exact reverse of nationalisation (e. g. Bös, 1989, p. 218). In the specific case of Germany's railways, generations of transport economists had regarded the nationalisation of the Prussian railways from 1879 onwards as the logical and cogent solution for railway systems as such, disregarding the fact that even then alternatives existed (Fremdling, Knieps 1993, p. 129ff.).

The promoters of the centralised state-owned and state-operated railway system, which finally emerged in Prussia, justified nationalisation in order to counteract the tendency towards cartels and further monopoly exploitations and subsequent excessive access charges, asymmetric access conditions, incompatible railway tracks or intransparent tariff systems. By considering nationalisation as a substitute for access regulation they distracted from the real regulatory problem of guaranteeing non-discriminatory access as a precondition for competition on the track. After all, competition on the track had been excluded. The major arguments in favour of a competitive supply of railway services on the same track had already been put forward before nationalisation. Firstly, for the supplier of the best transportation services such a scheme would have provided the possibil-

ity to use the best route instead of forcing him to build unnecessary tracks; secondly, the discretion of monopolistic railway-owners with respect to the quality of their transportation services and their tariffs could have been checked; and finally, the competitive supply of transportation services would have reduced tariffs to a cost-oriented low level, and so have increased the efficiency of transportation.

This competition on the track, however, was never implemented. During the initial phase of railway construction the government had been primarily interested in the promotion of railways by attracting private profit-seeking capital rather than worrying about potential monopoly rents. By not enforcing competition on the track moderate profits were secured. During the second phase monopolistic practices were considered sufficiently checked by stimulating competition among lines. During the third phase increasing cartelisation made another change of policy overdue. Thus competition on the track gained a prominent place in the intense discussion that arose before nationalisation in the late 1870s (Fremdling, Knieps, 1993, p. 130).

The major reason for nationalisation from 1879 onwards – beyond military reasons – was that railway revenues served as a substitute for proper taxes in order to finance Prussia's budget (Fremdling, 1980, p. 34, table 4). These were obviously not based on sector-specific economic rationality, but on more general reasons. The widely held discussion focussing on the distinction between state and private railway systems obscured the relevant question of regulation. The Prussian railway law of 1838 already provided the legal framework to regulate railways in such a way that the advantages of broad competition could have been gained. During the period of competition among lines, however, this regulatory framework was rather superfluous. But as soon as the competition among lines weakened, it became urgent to apply efficient regulatory instruments. Since the complete nationalisation of Prussia's railway system in the late 1870s – including tracks and services – was considered a substitute for access regulation, the disaggregated regulatory framework of the Prussian railway law was never implemented.

2.2 State-owned enterprises in postal and telecommunications networks

In Germany, the exclusive rights of Federal Institutions to telephony and telegraph activities were established in 1892 in the Law on Telegraphy. This Law was slightly revised in 1928 in the so-called “Fernmeldeanlagenengesetz” (FAG). It entailed the exclusive monopoly rights over telephony. It has been exercised for the public services by the Ministry of Post and Telecommunications (DBP) and for the military services by the Defence Ministry. The DBP, which provided the civilian services exclusively, did so according to Article 87 of the Basic Constitutional Law of 1949 (Grundgesetz), in the form of a federally-owned public administration. The precise details were laid down in the Postal Law of 1953 (PostVwG). A Board of Overseers, which was created under the same Law, exercised certain controls and had a supervisory function over the DBP. For example, it had to approve the annual budget, changes in the tariff level and structure and the introduction of new services. Its 25 members included a technical specialist for telecommunications and a specialist on budget and finance. The rest were political appointees, such that the control was more political and actually much more one in name than in spirit, strongly relying on self-regulation. The Minister for Postal Affairs, for example, was able to specify in detail the actual user guidelines, which were the legal rules for using the telecommunications system.

The DBP was the sole provider of the public switching and transmission systems. These were planned and installed by the DBP. It purchased the equipment, maintained and extended it and had, therefore, an important monopoly power in the market for telecommunications equipment.² In addition, the DBP also regulated the utilisation of the network. It specified who, and to what extent, was allowed to utilise the network. The utilisation of existing services for third parties was only possible under very restrictive criteria (for example only for wholly-owned subsidiaries).³

² Technical conception, development and production were carried out by a number of domestic equipment suppliers.

³ For more details see Knieps, Müller, von Weizsäcker, 1982.

3. Privatisation and entry deregulation

3.1 The German telecommunications reform

In Germany a new law was passed on 1 July 1989,⁴ restructuring the traditional Deutsche Bundespost into three independent enterprises: Postal Services, Telecommunications Services and Postbank, which were finally privatised. For telecommunications the public enterprise DBP Telekom has been transformed into the privatised Deutsche Telekom AG in 1995. Although the state still holds a large part of the shares, privatisation can be considered as real, not only as formal, because a significant part of the shares are traded at the stock exchanges.

Privatisation of the former Deutsche Bundespost has been accompanied by entry deregulation in two steps. Under the strong influence of the Commission's „Green Paper on the Development of the Common Market for Telecommunications Services and Equipment“ (KOM (87) 290 fin.) of June 1987 partial entry deregulation was introduced in European countries. There have been controversial debates on the costs and benefits of global entry deregulation. The obstacles to comprehensive entry deregulation did not, however, exclude the possibility of partial entry deregulation. Partial entry deregulation included free entry into terminal equipment supply and into value added network services (VANS) on the basis of the physical network provided by the network monopolist. There were two reasons why partial entry deregulation was politically feasible. First, partial entry deregulation was a useful measure to avoid large business users placing their telecommunications centres abroad and maintaining only enlarged terminals within the country. This danger was imminent because European countries are relatively small and therefore in a potentially competitive situation vis-à-vis each other. Second, the network monopolist had an interest in allowing partial entry deregulation and promoting VANS competition on its network. For as a public monopoly, the network monopolist was relatively inefficient and unable to exploit the whole innovation potential within the telecommunications

⁴ Gesetz zur Neustrukturierung des Post- und Fernmeldewesens und der Deutschen Bundespost (Poststrukturgesetz) vom 8. Juni 1989, Bundesgesetzblatt Teil I vom 14. Juni 1989, pp. 1026-1051.

market. By means of the exclusive provision of network facilities, however, it could always skim part of the innovation rents generated by private entrepreneurs.

The partial deregulation of the telecommunications sector already resulted in free entry into terminal equipment supply and value-added network services, employing the physical network of the DBP Telecom monopoly. Moreover, in addition to DBP Telecom two alternative mobile communications providers were licensed. Although the voice telephony market was still monopolised, long distance tariffs were falling by about 20 % during the period 1996-1998. Between 1989 and 1994 tariffs for households had already been decreasing by 9.3 % (Boss et al., 1996, pp. 194f.). This already indicates not only the technological process in the telecommunications sector, but also the increasing instability of partial entry deregulation. Due to the tendency to mix voice and data communications services it became increasingly difficult to differentiate between legally protected voice telephone services and competitive value-added network services (e.g. Knieps, 1989, pp. 179f.).

The “Green Paper on the Liberalisation of Telecommunications Infrastructure and Cable Television Networks” issued by the Commission in October 1994 (KOM (94) 440 endg.) again strongly influenced the process of the liberalisation of European telecommunications. The “Full Competition Directive”⁵ of 13 March 1996 demanded that member countries allow free entry into all parts of telecommunications. The new telecommunications laws allowing overall market entry were enacted by the national parliament during 1996, coming fully into effect on 1 January 1998. In order to make free entry into all parts of telecommunications politically acceptable it was necessary to split the silent coalition between the telecommunications administration and small users. An important solution was the implementation of the concept of a universal service fund into

⁵ 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“).

the new telecommunications law.⁶ The purpose of the universal service fund is to keep the traditional subsidy of the small users stable and only change the way it is financed from internal to external subsidisation. In order to make sure that the small users would not oppose deregulation it seemed to be important to guarantee the price-level of the traditionally internally subsidised services as upper boundary (“social contract” pricing) (e. g. Blankart, Knieps, 1989).

Since the comprehensive opening of the networks massive commercial investments in alternative long distance infrastructures have been undertaken and in this area there is now both active and potential competition. Although the markets for long distance telecommunications services are still frequently characterised by economies of scale and economies of scope, there is nevertheless active and potential competition. Since overall free entry became possible, the performance of the German long distance telecommunications market has improved strongly: This includes a large number of service providers, providing an increasing scope of services, entry of several network carriers, strongly decreasing prices for long distance calls etc. (cf. Gabelmann, Groß, 2003, pp. 107f; Stumpf, Schwarz-Schilling, 1999).

After global entry deregulation three types of providers of long distance voice services emerged. The traditional incumbent Deutsche Telekom, alternative network providers (“nationale Vollsortimenter”) which invested heavily in infrastructure and switch based service providers which hardly invested in infrastructure. During the competition process differences in the price setting behaviour of the different types of firms could be observed. The intense price competition in the winter of 1998/99 not only reduced the overall level of prices, it also resulted in a convergence of prices. The internet and printed media were full of price information, agencies also provided information and the providers themselves advertised aggressively with price as the decisive variable in long distance telecommunications (Brunekreeft, Groß, 2000, p. 932).

⁶ See section 2 (§§ 17-22) of the German telecommunications law TKG of 25 July 1996 as well as the Telekommunikations-Universaldienstleistungsverordnung of 30 January 1997.

Whereas Deutsche Telekom held 100% of the market share for voice telephony before global entry deregulation, the market share of the competitors strongly increased during the period of competition. The competitors' market share (share of traffic volume in minutes) for national long distance calls, including regional calls, increased from 10.3 % in 1998 to 34.7 % in 2001; the market share for international calls increased from 20 % in 1998 to 51 % in 2001 (Monopolkommission, 2001, p. 45).⁷

3.2 The German railroad reform

On January 1, 1994, the „Bahnstrukturreform“ was enacted, based on the report of the „Regierungskommission Bundesbahn“, which was appointed by the government in 1989 (e.g. Ewers, 1994; Boss et al., 1996; Knieps, 1996). The transition from a public enterprise to a firm under private law in the form of a joint stock company can only be called formal privatisation (rather than a real privatisation by sale of publicly owned assets), because the state is still the sole owner of the Deutsche Bahn AG (DB AG). Separate branches for infrastructure (DB Netz AG), commodity transportation (DB Cargo), passenger long-distance transportation and passenger local transportation have been founded. Financial reasons also played a non-negligible role for the privatisation initiative. In contrast to the Prussian railway case nearly a century ago, the Deutsche Bundesbahn and the Deutsche Reichsbahn, its counterpart in East Germany, suffered from large amounts of debts (33,5 Mrd. €). The first step of the privatisation thus consisted of the relief of the liquidation of debts and the endowment with new capital.

A major goal of privatisation has been the entry deregulation of train services in the context of the liberalisation of European transportation markets. Accounting separation between service level and infrastructure level was considered a necessary precondition to guarantee non-discriminatory access to the tracks for all providers of train services. DB Netz is obliged to provide access to the tracks of

⁷ At that time no preselection and call-by-call were available for local calls.

the service providers on a non-discriminatory basis. Access charges have to be paid by all users of the infrastructure. However, the state is contributing to the financing of the infrastructure, in particular by so called „Baukostenzuschüsse“.

Active competition on the German railroad market is focussed on commodity transportation within Germany as well as local passenger transportation. Entry into cross-border transportation can rarely be observed; cabotage on foreign networks within other EU countries does not exist. Competitive subscriptions for subsidies for local passenger transportation take place only to a limited extent (e.g. Aberle, Eisenkopf, 2002, p. 68).

The strong national orientation of the capacity management of track capacities was caused by the traditional national railroad monopolies. Transborder orientation within the international union of railways (UIC) has been minimised with respect to standardisation (e.g. Knieps, 1995). Therefore, optimisation is strongly limited to national railroad systems. A long-term objective could be the founding of a European train traffic control agency responsible for the coordination of Europe-wide train services. Such a development could be strongly stimulated by separating train control from national rail infrastructure policies.

There has been an intense controversy on the issue of separating railway infrastructure from railway services and not only formally privatising the service companies of the Deutsche Bahn AG (e.g. Knieps, 1996, p. 44; Wissenschaftlicher Beirat beim Bundesministerium für Verkehr, 1997, p. 632). This, nevertheless, has not succeeded so far. Until recently, German railways were only formally privatised. Since private capital can only be raised if risk-equivalent interest rates can be expected, privatisation shifted public attention to the cost covering possibilities of access charges to the infrastructure.

DB AG issued its first access pricing system on July 1, 1994, consisting of separate catalogues of prices and conditions for access to its tracks for passenger transport and for freight transport. Its major characteristics were quantity rebates, based on the total amount of train kilometres undertaken on the track network of DB AG. Its successor, the second access pricing system (TPS 1998)

was issued by DB AG in June 1998. This revised rail track tariff system featured a two-tier level of charges. After obtaining an InfraCard, the track user was charged a lower variable price or, on the other hand, without using this card, he was charged higher rates according to the actual services made use of. Within each demand group, rail track users were treated on equal terms. In the case of capacity constraints arising from the sheer volume of rail track usage, customers using "InfraCards" or the "VarioPreis" (variable charges system) were treated equally. The third access pricing system (TPS 2001), issued by DB AG in 2001, was characterised by a linear tariff without volume discounts or optional InfraCard. Instead elements of product differentiation in the form of different categories of track capacities are offered.

The access charges ("Trassenpreise") of the DB AG have been unregulated so far. The newly founded railway-agency ("Eisenbahn-Bundesamt") only had the task to settle conflicts between the DB AG and third parties which arise in the context of access conditions and access charges. Earlier critics of the DB AG access charge policy already indicated that the overall level of the access charges would be too high (Aberle, Brenner, 1994, pp. 707-708). One reason would be the overload of employees of DB AG.

Until now the revisions of the access charge system of the DB AG only took place in reaction to public discussions. In particular, the reproach that quantity discounts or non-linear tariffs would be unilaterally in favour of the position of DB AG as dominant supplier of rail transportation services and therefore conditions of equal access to the tracks would be disturbed has led to the introduction of linear access charges, which are obviously inadequate to attract more traffic to the railway systems.

4. The search for an adequate regulatory scheme

4.1 The need for a sector-symmetric regulatory approach

In the past, 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. 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.

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” (“Vermutungskriterien”) 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.⁸ The sector-specific characteristics of network structures (economies of bundling) are not a sufficient reason to conclude that market

⁸ “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).

power must exist.⁹ It is necessary to differentiate between those areas in which 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.

The network economic concept of monopolistic bottlenecks suggests a connection with the essential facilities doctrine resulting from US antitrust law, which

⁹ 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.

is now also being used increasingly in European competition law.¹⁰ 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).¹¹

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.

¹⁰ This means that access to ports, airports or railway networks can neither be refused, nor granted under conditions that penalize competitors, without factual justification.

¹¹ 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.

As a consequence, one should differentiate between the question whether network-specific market power exists, and the question what kind of regulatory intervention is suitable. According to the Hausman-Sidak Test a regulatory obligation to unbundle network elements is not automatically justified if a network element meets the basic requirements of the essential facilities doctrine. There would be a need to show also that market power could be exercised in the provision of telecommunications services to end-users in the relevant geographic market by restricting access to the requested network element (cf. Hausman, Sidak, 1999, p. 479).

4.2 Phasing-out potentials for sector-specific regulation

Although the general direction of the new German telecommunications law to open all parts of the telecommunications sector for competition can be considered as an enormous step forward, the telecommunications law of 1996 contained a strong tendency towards excessive regulation (e.g. Immenga, Kirchner, Knieps, Kruse, 2001). In the meantime the telecommunications law of 1996 was reviewed, and a revised telecommunications law was enacted in June 2004.¹² Since the focus of this revised law is also on infrastructure competition, it can be expected that sector-specific regulation will decline in the future.

Issues of non-discriminatory access to railway infrastructure – including the question of track-access charges – have been increasingly considered by the German Cartel office. Only recently has the introduction of sector-specific regulation to the German railroad sector been taken into consideration (e.g. Berndt, 2002, p. 209).

The sector-symmetric application of the disaggregated regulatory approach to the sectors of railway and telecommunications shows that the problem of non-discriminatory access has to be solved with respect to the railway infrastructure

¹² Telekommunikationsgesetz (TKG) vom 22. Juni 2004, Bundesgesetzblatt Jahrgang 2004, Teil I, Nr. 29, ausgegeben zu Bonn am 25. Juni 2004, pp. 1190-1243.

as a whole, whereas in telecommunications only the local loop may create a remaining regulatory problem. All other areas should be transferred into the sole competency of the general competition law.

Instead of the rather opportunistic changes of access charge systems in the German railroad industry, a more systematic regulation of the market power of the track owner by applying modern regulatory instruments (e.g. price-cap regulation) should be applied. The remaining regulatory problems are due to the market power inherent in railway tracks. Whereas active and potential competition of transport firms acting on the track initiates a trend towards cost-oriented transportation tariffs, railway tracks themselves must be regarded as sunk costs which cannot be shifted to another market. Therefore, if a potential competitor plans an entry with a parallel track, the incumbent railway owner could reasonably threaten to reduce his tariffs to the short-run variable costs. Thus, once a railway network is completed, one cannot expect further entries with additional tracks. The decision-relevant costs of entry include the costs of the tracks, which could not be covered by tariffs based on short-run variable costs. In contrast to the supplier of rail-services the track owner in question has therefore obtained network-specific market power. Since competition among lines is lacking, unregulated access charges create the danger that the track owner exploits its monopoly power. Nevertheless, regulation should focus on the price level, leaving the design of price structures as an entrepreneurial task to the infrastructure provider (e.g. Knieps, 2001, p. 284).

In contrast to railroads, in telecommunications large phasing-out potentials of sector-specific regulation can be observed. Looking ahead, the Europe 2005 Action Plan promotes a multi-platform approach to broadband development, driven by strong competition between networks and services. In the meantime, the focus of the EU Commission shifts to considering the importance of technology-neutral regulation avoiding favouring one technology over another. Technology-neutral regulation is designed to allow provision of new services to lead to competition between different network-access methods (facilities-based competition). As an important conclusion, the Commission states “When there is effective facilities-based competition, the new framework will require ex-ante regula-

tory obligations to be lifted” (Commission of the European Communities, 2003, p. 6).

Effective facilities-based competition will include high-speed access. From the perspective of high-speed broadband access, the local loops of the established telecommunication carriers therefore lose the characteristics of a monopolistic bottleneck. Alternative broadband access technologies (cable modem, UMTS, mobile access etc.) create economically sensible alternatives to xDSL. Due to the increasing role of product differentiation, based on the different network characteristics of these access technologies, the long-run convergence towards a single globally dominating access technology seems unrealistic. As a consequence, sector-specific regulation of broadband access – in particular line sharing obligations – seems superfluous.

The aim of technology-neutral regulation is also stated in the revised telecommunications law enacted in June 2004 (§ 1 TKG). This implies that in an environment of competing network infrastructures ex-ante regulation should not be extended but removed. Alternative competing broad-band access technologies should not be regulated. Moreover, the traditional regulation of narrow-band access should not be continued for historical reasons, but abolished as soon as narrow-band access loses its bottleneck characteristics. Only then will the adequate incentives for investments in new network infrastructures be provided and an unbiased infrastructure and service competition be guaranteed.

5. Conclusions

As a consequence of privatisation and entry deregulation the application of the general competition law as well as sector-specific regulation became increasingly important, replacing the period of self-regulation. The division of labour between sector-specific market power regulation and general competition law varies strongly between the different network industries. 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 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. 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. Whereas all network services can be provided efficiently in competitive markets without market regulation, the provision of network infrastructures may require sector-specific regulation. The sector-symmetric application of the disaggregated regulatory approach to the sectors of railway and telecommunications shows that the problem of non-discriminatory access has to be solved with respect to the railway infrastructure as a whole, whereas in telecommunications only the local loop may create a remaining regulatory problem. In contrast to railroads, in telecommunications large phasing-out potentials of sector-specific regulation can be observed. From the perspective of high-speed broadband access, the local loops of the established telecommunication carriers are already losing the characteristics of a monopolistic bottleneck. Alternative competing broad-band access technologies should not be regulated. Moreover, the traditional regulation of narrow-band access should not be continued for historical reasons, but abolished as soon as narrow-band access loses its bottleneck characteristics.

References

- Aberle, G., Brenner, A (1994), Trassenpreissystem der Deutschen Bahn AG - eine erste kartellrechtliche und ökonomische Beurteilung, Internationales Verkehrswesen 46, 707-712.
- Aberle, G., Eisenkopf, A. (2002), Schienenweg und Netzzugang – Regulierungsprobleme bei der Öffnung des Schienennetzes und wettbewerbspolitische Empfehlungen zur Gestaltung des Netzzugangs, Hamburg: Deutscher Verkehrs-Verlag.
- Areeda, P., Hoverkamp, H. (1988), An Analysis of Antitrust Principles and Their Application, Antitrust Law, 1988/Supp.
- Baumol, W.J., Panzar, J.C., Willig, R.D. (1982), Contestable Markets and the Theory of Industry Structure, San Diego.
- Berndt, A. (2002), Freie Fahrt durch mehr Regulierung? – Neue Entwicklungen im Bahnsektor, in: Knieps, G., Brunekreeft, G. (Hrsg.), Zwischen Regulierung und Wettbewerb – Netzsektoren in Deutschland, Heidelberg, 2. Auflage, 219-230.
- Blankart, Ch.B., Knieps, G. (1989), What Can We Learn From Comparative Institutional Analysis? The Case of Telecommunications, in: Kyklos 42, 579-598.
- Bös, D. (1989), Arguments on Privatization, in: Fels, G., v. Fürstenberg, G.M. (eds.), A Supply-Side Agenda for Germany, Berlin, et al., 217-245.
- Boss, A., Laaser, C.-F., Schatz, K-W., et al.(1996), Deregulierung in Deutschland – Eine empirische Analyse, Kieler Studien 275, Tübingen.
- Brunekreeft, G., Groß, W. (2000), Prices for long-distance voice telephony in Germany, Telecommunications Policy 24, 929-945.
- Commission of the European Communities (2003), Communication from the Commission to the Council, the European Parliament, the economic and social Committee and the Committee of the Regions, Electronic Communications: the Road to the Knowledge Economy, Brussels, 11.2.2003, COM(2003) 65 final.

- Ewers, H.-J. (1994), Privatisierung und Deregulierung bei den Eisenbahnen – Das Beispiel der Deutschen Bundesbahn und der Deutschen Reichsbahn, in: *Jahrbuch für Neue Politische Ökonomie*, Band 13, 178-208.
- Fremdling, R. (1980), Freight rates and state budget, The role of the National Prussian Railways 1880-1913, in: *Journal of European Economic History* 9, 21-39.
- Fremdling R., Knieps, G. (1993), Competition, Regulation and Nationalization: The Prussian Railway System in the Nineteenth Century, in: *Scandinavian Economic History Review*, Vol. XLI, No. 2, 129-154.
- Gabelmann, A., Groß, W. (2003), Telekommunikation: Wettbewerb in einem dynamischen Markt, in: Knieps, G., Brunekreeft, G. (eds.), *Zwischen Regulierung und Wettbewerb – Netzsektoren in Deutschland*, Heidelberg, Physica-Verlag, 2. Auflage, 85-130.
- Hausman, J., Sidak, J.G. (1999), A Consumer-Welfare Approach to the Mandatory Unbundling of Telecommunications Networks, *Yale Law Journal*, Vol. 109, 417-505.
- Immenga, U., Kirchner, C., Knieps, G., Kruse, J. (2001), *Telekommunikation im Wettbewerb – Eine ordnungspolitische Konzeption nach erfolgreicher Marktöffnung*, München.
- Kay, J.A., Thompson, D.J. (1986), Privatisation: A Policy in Search of a Rationale, in: *The Economic Journal*, 96, 18-32.
- Knieps, G. (1989), Telecommunications Policy – Assessing Recent Experience in the US, Japan and Europe and its Implications for the Completion of the Common Market, in: Giersch, H. (ed.), *Services in World Economy*, Symposium 1988, Tübingen: J.C.B. Mohr (Paul Siebeck), 173-189.
- Knieps, G. (1995), Standardization: The Evolution of Institutions versus Government Intervention, in: Gerken L. (ed.), *Competition Among Institutions*, London: MacMillan Press, 283-296.
- Knieps, G. (1996), *Wettbewerb in Netzen – Reformpotentiale in den Sektoren Eisenbahn und Luftverkehr*, Tübingen.

- Knieps, G. (2001), The Economics of Network Industries, in: G. Debreu, W. Neuefeind, W. Trockel (eds.), Economic Essays – A Festschrift for Werner Hildenbrand, Springer Verlag, Berlin u. a., 275-293.
- Knieps, G., Müller, J., von Weizsäcker, C.C. (1982), Telecommunications Policy in West Germany and Challenges from Technical and Market Development, in: Zeitschrift für Nationalökonomie/Journal of Economics, Suppl. 2, 205-222.
- Lipsky, A.B., Sidak, J.G. (1999), Essential Facilities, Stanford Law Review, Vol. 51, 1187-1249.
- Monopolkommission (2001), Wettbewerbsentwicklung bei Telekommunikation und Post 2001: Unsicherheit und Stillstand, Sondergutachten, Bonn.
- Pommerehne, W.W. (1990), Genügt bloßes Reprivatisieren?, in: Aufderheide, D. (Hrsg.), Deregulierung und Privatisierung, Symposium Oeconomicum Muenster, Stuttgart, Berlin, Köln, 27-63.
- Sidak, J.G., Engel, C., Knieps, G. (eds.) (2001), Competition and Regulation in Telecommunications – Examining Germany and America, Kluwer Academic Publishers, Boston et al.
- 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.
- Stumpf, U., Schwarz-Schilling, C. (1999), Wettbewerb auf Telekommunikationsmärkten, Diskussionsbeitrag Nr. 197, Wissenschaftliches Institut für Kommunikationsdienste, Bad Honnef.
- Thiemeyer, T. (1989), Öffentliche Unternehmen als Voraussetzung der Funktionsfähigkeit eines modernen marktwirtschaftlichen Systems, in: Verbraucherpolitische Hefte Nr. 9, 23-35.
- Wissenschaftlicher Beirat beim Bundesministerium für Verkehr (1997), Bahnstrukturreform in Deutschland – Empfehlungen zur weiteren Entwicklung. Stellungnahme vom November 1997, Internationales Verkehrswesen, 49, 626-633.

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52. **G. Knieps:** Der Irrweg analytischer Kostenmodelle als regulatorische Schattenrechnungen: Eine kritische Analyse der Stellungnahmen zum WIK-Kostenmodell, erschienen in: MultiMedia und Recht (MMR), 11/1998, S. 598-602
53. **G. Brunekreeft:** Peak-Load Pricing, Perfect Competition and Price Discrimination, October 1998
54. **G. Knieps:** Costing und Pricing auf liberalisierten Telekommunikationsmärkten, erschienen in: MultiMedia und Recht (MMR), 3/1999 (Beilage), S. 18-21
55. **G. Brunekreeft:** Light-handed Regulierung des Zugangs zu Infrastrukturen: Das Beispiel Neuseeland, erschienen in: Schriftenreihe der Deutschen Verkehrswissenschaftlichen Gesellschaft: Diskriminierungsfreier Zugang zu (Verkehrs-)Infrastrukturen: Konzepte, Erfahrungen und institutionelles Design, Reihe B, B 224, 1999, S. 82-103
56. **G. Knieps:** Interconnection and Network Access: The Case of Telecommunications, erschienen in: Fordham International Law Journal, Symposium, Vol. 23, 2000, S. S90-S115
57. **G. Knieps:** Diskriminierungsfreier Zugang zu Netzinfrastrukturen: Eine Herausforderung an das Wettbewerbsrecht und die Wettbewerbspolitik, erschienen in: Schriftenreihe der Deutschen Verkehrswissenschaftlichen Gesellschaft: Diskriminierungsfreier Zugang zu (Verkehrs-)Infrastrukturen: Konzepte, Erfahrungen und institutionelles Design, Reihe B, B 224, 1999, S. 7-22
58. **G. Brunekreeft:** Vertical Integration to Conceal Profitability; A Note, April 1999
59. **G. Knieps:** "Review 1999" der EU-Kommission: Ein Beitrag zur Reform der Interconnection-Regulierung aus netzökonomischer Sicht, erschienen in: MultiMedia und Recht (MMR), 8/1999, S. 460-464
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. **G. 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
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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, in: Nordrhein-Westfälischen 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
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