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**Telecommunications markets in the stranglehold of EU regulation:
On the need for a disaggregated regulatory contract***

by Günter Knieps

Discussion Paper

Institut für Verkehrswissenschaft und Regionalpolitik

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Abstract:

The increasing complexity of EU regulation is resulting in a tangle of contradictory decisions and statements, involving also new markets, such as interactive cable television, Internet etc. Whereas in the past sector-specific regulation has been applied in a discretionary manner in order to correct the rules of the market game, the really challenging task for the future seems to be the development and implementation of statutory constraints for the regulatory authorities in order to guarantee a predictable regulation of market power. For this purpose the design and implementation of a disaggregated regulatory contract on the statutory level (EU Directives and national law) is derived, which should be an essential principle in the EU Review 2006. Its basic components consist of limiting regulation to monopolistic bottlenecks, exploiting the phasing-out potentials, and a disaggregated application of regulatory instruments. In contrast, the problem of opportunistic regulatory behaviour with respect to irreversible investments can be solved by the application of the already existing statutory constraint of the Framework Directive guaranteeing financial viability.

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1. Introduction

The liberalization of the telecommunications sector has brought the traditional regulatory contract to an end. Its principal components – entry controls, rate regulation and utility service obligations (Sidak, Spulber, 1997, p. 113) – have undergone a radical reform. Legal entry barriers have been abolished and thus the right to serve. At the same time, the right to be served by the traditional monopolist has been replaced by bidding for the subsidized markets to reveal the most efficient supplier financed by a universal service fund (Blankart, Knieps, 1989, pp. 592-594).

In 1999 the European Commission started a review process in order to consider to what extent phasing out of sector-specific market power regulation should take place. The key objectives stated at the beginning of the reviewing process were the maximization of the application of the general European competition law, the minimization of sector-specific regulation, and a rigorous phasing out of unnecessary regulation (European Commission, 1998, p. 3).

On 12 July 2000 the European Commission presented its “1999 Review Package”, with five proposals for Directives of the European Parliament and the Council and one proposal for a Regulation. In the meantime these proposals have been enacted: an ONP Framework Directive,¹ an Access and Interconnection Directive,² a Licensing Directive,³ a Universal Service Directive,⁴ a Per-

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), OJ L108/33, 24. 4. 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), OJ L108/7, 24.4. 2002.

³ Directive 2002/20/EC of the European Parliament and of the Council of 7 March 2002 on the authorisation of electronic communications networks and services (Authorisation Directive), OJ L108/21, 24.4.2002.

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), OJ L108/51, 24.4.2002.

sonal Data/Protection of Privacy Directive⁵, which came into effect in July 2003. A Proposal for the regulation of unbundled access to the local loop has been passed by the European Parliament and the Council and was enacted in January 2001.⁶

Neither the Framework Directive nor the Access Directive provide a clear-cut definition of future sector-specific regulation, in particular, the regulatory basis is left to the interpretation of the European Commission. The Framework Directive provides a new interpretation of the criterion of significant market power, moving in the direction of establishing the criterion of dominance on 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. Both the Framework Directive and the Access Directive leave the planned extent of the future sector-specific market power regulation in long-distance networks in the dark. Moreover, it remains uncertain to what extent the phasing-out potentials of regulating the local loop due to the emergence of new competing technologies will be exploited.

The paper is organized as follows: in section 2 a critical appraisal of the regulatory status quo within the EU is provided. Due to the unspecific regulatory obligations of the EU Directives a large scope of discretionary power of the European Commission in defining the regulatory basis is indicated, including the interaction between the European Commission and national regulators. It is demonstrated that the weak, non-binding statutory control of the regulatory agencies results in a massive regulatory overkill. In section 3 the need for the design and implementation of a disaggregated regulatory contract on the statutory level (EU Directives and national law) is shown, which should be an essential principle in

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), OJ L 201/37, 31.7.2002.

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, OJ L336/4, 30.12.2000.

the EU Review 2006. Its basic components consist of limiting regulation to monopolistic bottlenecks, exploiting the phasing-out potentials, and a disaggregated application of regulatory instruments. Instead of the weak, economically unfounded criterion of significant market power, the localization of network-specific market power based on the theory of monopolistic bottlenecks should be a central cornerstone for a statutory constraint to discipline the regulatory agencies. As a consequence, the regulatory basis should be strictly limited, avoiding over-regulation and reducing the discretionary power of the regulatory agencies.

2. A critical appraisal of the regulatory status quo

2.1 The unspecific regulatory obligations based on the EU Directives

The 1999 Review left the future scope of sector-specific regulation undecided. The competency to specify the areas as well as the instruments of future market power regulation was delegated to the Commission (Framework Directive, Article 15). In July 2002, the European Commission published its Guidelines focusing on the characterisation of markets for which sector-specific regulation might be considered to be necessary in the future (European Commission, 2002). Under this regulatory framework markets are defined and market power assessed using the same methodologies as under competition law (European Commission, 2002, Recital 24). In particular, in order to identify significant market power (SMP), the Commission's Guidelines formulate a long list of criteria indicating the existence of a dominant position. These criteria include: overall size of the undertaking, control of infrastructure not easily duplicated, technological advantages or superiority, absence of or low countervailing buying power, easy or privileged access to capital markets/financial resources, product/services diversifications, economies of scale, economies of scope, vertical integration, a highly developed distribution and sales network, absence of potential competition, barriers to expansion (European Commission, 2002, Recital 78).

The Commission's Guidelines do not present a clear and economically well-founded concept for localising network-specific market power. Even the criteria of general competition law are not considered consistently. Although it is stressed that the existence of a dominant position cannot be established on the sole basis of large market shares and would require a thorough and overall analysis of the economic characteristics of the relevant market (European Commission, 2002, Recital 78), it is argued that the doctrine of the 'essential facilities' would be less relevant for the purposes of ex ante applying Article 14 of the Framework Directive than ex post applying Article 82 of the EC Treaty (European Commission, 2002, Recital 82).⁷

2.2 The large potential of the discretionary power of the European Commission and the national regulators

Compared to the long list of criteria stated in the Commission's Guidelines (European Commission, 2002) the development of the three criteria in the Commission Recommendation of February 2003 seems to constitute progress (European Commission, 2003a, Recital 9). In order to justify the imposition of regulatory obligations on a given market, the following three criteria should be fulfilled: The first criterion is the presence of high and non-transitory entry barriers whether of structural, legal or regulatory nature. The second criterion admits only those markets, the structure of which does not tend towards effective competition within the relevant time horizon. The third criterion is that application of competition law alone would not adequately address the market failure(s) concerned (European Commission, 2003a, Recital 9). The focus on non-transitory entry barriers seems to be a good starting point for an economically based regulation of remaining network-specific market power.

⁷ This is a definite step away from the Access Notice of August 1998 (Notice on the application of the competition rules to access agreements in the telecommunications sector - framework, relevant markets and principles (98/C 265/02, Official Journal of the European communities, C 265/2, 22.8.98), which extended the role of competition policy, pointing out the importance of ensuring non-discriminatory access to essential facilities.

The question remains to what extent the Commissions' Decisions as well as the Decisions of the national regulators are constrained by such criteria and if not, how institutional reform should be designed to enforce these criteria on an economically well-founded basis. However, in the same document (European Commission, 2003a, Annex) the Commission defined 18 markets, on which the imposition of regulatory obligations might be justified.⁸ Such a list of serious candidates for sector-specific regulation can only be derived by means of an economically well-founded analysis. It seems obvious that this is not the case, considering the 18 markets defined in the Recommendation. Candidates for removal have already been pointed out (de Streel, 2004, p. 22), including all markets on the retail level (international, national, and local telephone services, access to public telephone service) as well as some markets on the wholesale level (transit services in the fixed public telephone network, wholesale trunk segments of leased lines etc.). It is interesting to remember that the market for wholesale trunk segments of leased lines (market 14), for example, was already characterised as competitive by the Commission in 1999.⁹

2.3 Increasing complexity of EU regulation: The 200 Commission Decisions on Art. 7 Procedures

Article 7 of the Framework Directive gives the European Commission the right to oversee the national regulatory measures, by way of the consultation procedures. These procedures require national regulatory authorities to conduct a con-

⁸ The list is based on Article 15 of the Framework Directive (Annex I). The product and service markets listed in the annex contain 7 markets on the retail level (including international, national and local telephone services), as well as 11 markets on the wholesale level (including transit services in the fixed public telephone network, wholesale trunk segments of leased lines, and wholesale broadband access).

⁹ "Major commercial investments in long-distance optical fibre infrastructure are underway in Europe, and it is expected that several thousand kilometres of optical fibre will become operational by the early part of 2000, linking all major European cities. This massive investment in alternative infrastructure is expected to create for the first time significant competition for the incumbent operators' leased line offers, in particular on their long-distance and cross-border leased line markets." (European Commission, 1999, p. 4).

sultation on the regulatory measures they intend to take - comprising definition and analysis of relevant markets and the proposed imposition or removal of regulation on undertakings providing electronic communications networks or services - prior to adoption. The Commission may comment on the draft measures, and in certain cases, exercise its veto power requiring their withdrawal (Framework Directive, Art. 7., cif.4 b).¹⁰

The starting point for the market analysis of the national regulatory agencies is the Commission's Recommendation on relevant markets (European Commission 2003a) and the Commission's Guidelines on market analysis and assessment of significant market power (European Commission 2002). The national regulatory agencies may define markets appropriate to national circumstances, particularly relevant geographic markets within their territories (European Commission 2003a, Recital 19).

Since its inception two years ago, the Commission has assessed more than 200 notifications and the figure is expected to increase further in the next year.¹¹ 139 of those notifications have been published until 8 September 2005.¹² There have been numerous Commission Decisions so far on each of the 7 different markets on the retail level, as well as on 10 different markets on the wholesale level.¹³

A closer look at the Commission's Decisions on article 7 procedures reveals that the evaluation of significant market power is still strongly based on market share estimations.¹⁴ The three criteria in the Commission's Recommendation of

¹⁰ More detailed procedural rules are set out in European Commission 2003b, p. 13.

¹¹ Electronic communications: Commission delivers review of 200th notification by Member States of measures to improve competition, Brussels 14 July 2005, IP/05/926.

¹² <http://forum.europa.eu.int/Public/irc/info/ecctf/library?l=/commissionsdecisions&vm=detailed&sb=Title>

¹³ Until now, there has been no case with respect to market 17: the wholesale national market for international roaming on public mobile networks.

¹⁴ "Although market shares alone are not in themselves indicative of the presence or lack of market power, according to established case-law under EC competition rules (F.N. 8 in original) a market share in excess of 50 % is, in the absence of exceptional circumstances, in itself evidence of a dominant position (F.N. 9 in original) " (Commission Decision of 20 February 2004, Cases FI/2003/0024 and FI/2003/0027, p.5).

February 2003 were only considered (if at all) as supplementary.¹⁵ A consistent and economically well-founded analysis is lacking.

Although a detailed analysis of this large set of decisions is beyond the scope of this paper, a brief survey of the cases already provides the following insights: In the notifications the need for ex ante regulation is typically not analysed according to the three criteria pointing into the direction of an economic foundation of network-specific market power (European Commission, 2003, Recital 9). As a consequence of the missing economic analysis of network-specific market power a time-consuming and inconsistent administrative process has been initiated, leaving the remaining necessity for sector-specific regulation unspecified.

An illustrative example is the market for publicly available international telephone services provided at a fixed location for residential customers (market 4) and non-residential customers (market 6). These markets are characterised by effective competition, irrespective of the country-specific characteristics, as follows immediately from the European Commission's evaluation of long-distance and cross-border telecommunications markets (European Commission, 1999).¹⁶ As has been stated by the Finnish Regulatory Commission (Ficora), and agreed by the Commission, "it is relatively easy to enter the markets, since no significant investments in the network infrastructure is needed" (F.N. 6 in the original),¹⁷

Nevertheless, even for these markets contradictory conclusions have been drawn by different national regulatory authorities and equally accepted by the European Commission. The Swedish and Finnish regulatory agencies concluded that their international call markets for residential and non-residential users are effec-

¹⁵ "On the basis of the analysis of the three criteria" (F.N. 5 in original) PTS concludes that the notified markets are characterised by law barriers to entry" (F.N. 6 in original). Despite this conclusion, PTS conducts a SMP analysis of the notified markets on the grounds that these markets have previously been regulated" (F.N. 7 in original) and that there is a link with the existing regulation in other, related markets" (EC Comments, 24. 06. 2005, Cases SE/2005/0195, SE/2005/0196, SE/2005/0197 and SE/2005/0198, p. 3).

¹⁶ In network economics this fact is by now common knowledge (cf. Laffont, Tirole 2000, p. 98; Knieps, 1997, pp. 327f.). See also the analysis in the next section 3.

¹⁷ Commission's Decision of 14. 07. 2005, Cases FI/2005/0201 and FI/2005/0202, p. 3.

tively competitive.¹⁸ In Austria, the national regulatory authority stated that only the international call market for residential users is competitive, whereas the international call market for business users still requires regulation.¹⁹ In Hungary, Portugal, and Ireland both the international markets for residential and non-residential users are considered to be in need of being regulated.²⁰

This increasing complexity of EU regulation is resulting in a tangle of contradictory Decisions and statements, involving also new markets such as interactive cable television, Internet etc. Whereas in the past sector-specific regulation has been applied in a discretionary manner in order to correct the rules of the market game, the really challenging task for the future seems to be the development and implementation of constitutional rules to provide statutory constraints for the regulatory authorities in order to guarantee predictable regulatory actions.

3. Proposal for the EU Review 2006: A disaggregated regulatory contract

It is well known from the positive theory of regulation that regulators have strong incentives to over-regulate, mix regulatory instruments in an unsuitable way, favour the application of detailed regulation and call for a heavy-handed supervision of firms (e.g. Stigler, 1971; Knieps, 1998). This is the very reason why an a priori “framing” Decision to limit the regulatory basis by statutory constraints is of particular importance.²¹ In the following the design of a disag-

¹⁸ EC Comments, 24. 06. 2005, Cases SE/2005/0195, SE/2005/0196, SE/2005/0197 and SE/2005/0198. Commission’s Decision of 14. 07. 2005, Cases FI/2005/0201 and FI/2005/0202.

¹⁹ EC Comments, 13.01.2005, Cases AT/2004/124 and AT/2004/125.

²⁰ EC Comments, 28.01.2005, Cases HU/2005/0132, HU/2005/0133, HU/2005/0134 and HU/2005/0135; EC Comments, 25.06.2004, Cases PT/2004/0053, PT/2004/0054, PT/2004/0055, PT/2004/0056, PT/2004/0057, PT/2004/0058 and PT/2004/0059; EC Comments, 25.04.2004, Cases IE/2005/0158-159, Cases IE/2005/0160-161-162-163.

²¹ The importance of statutory obligations to discipline the discriminatory power of regulatory agencies has been analysed in detail in Spulber, Besanko, 1992; Newbery, 2000, chapter 2; Sidak, Spulber 1997; Gans, King, 2003.

gregated regulatory contract on the statutory level (EU Directives and national law) is elaborated, consisting of three major elements: limiting regulation to monopolistic bottlenecks, exploiting phasing-out potentials, and disaggregated application of sector-specific regulatory instruments.

3.1 Limiting regulation to monopolistic bottlenecks

An appropriate economic reference model that exposes the need for action to control market power in network sectors must be capable of grasping essential network characteristics (economies of scale, economies of scope, externalities, etc) without automatically associating them with market power. A case-dependent combination of the criteria listed in the Commission's Guidelines in order to identify significant market power without analytical foundation is not adequate to identify stable network-specific market power. The purpose of this section is to show that stable network-specific market power and the ensuing need for regulation only exist in the event of monopolistic bottlenecks.

The theory of monopolistic bottlenecks is central to the disaggregated regulatory approach in terms of locating network-specific market power in connection with the efforts to determine the minimum basis for regulation (cf. Knieps, 1997a, pp. 327-331 ; Knieps, 1997b, pp. 362-368), the aim being to come up with a coherent basis consistent with network economics which can be applied to all network sectors and which regardless of historical or institutional quirks provides justification for *ex ante* regulatory measures. For the remaining network areas the application of general competition law is sufficient. In this context, the need for regulation is concerned in particular with the need to design a system for controlling access to monopolistic bottlenecks and for charging users. The problems associated with monopolistic bottlenecks, and in particular the problem of network access (Baumol, Willig, 1999, p. 44; Knieps, 2000, pp. 295-299; Laffont, Tirole, 2000, p. 98; Kuhlmann, Vogelsang, 2005, p. 34) are currently frequent topics of discussion in the context of network economics.

Network-specific market power can only be identified by consistently implementing Stigler's concept of market entry barriers. According to Stigler:

“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).

Provided inputs are available to active and potential market players under the same conditions, according to Stigler there are no barriers to entry. Therefore, economies of scale, for example, do not constitute entry barriers, provided newcomers to the market also have access to the same cost function. Stigler's concept also implies that traditional competition parameters such as product differentiation coupled with the need to build up a good reputation and develop goodwill, or the capital required are not entry barriers because they affect all active and potential players equally. In other words, these are situations where the cost functions depend only on factors that are systematically available to all enterprises.²²

The conditions governing a monopolistic bottleneck are met when:

- (1) a facility is necessary for reaching customers, i.e. if no second or third such facility exists, in other words if there is no active substitute. This is the case when due to economies of scale and economies of scope a natural monopoly exists and a single provider is able to make the facility available more cheaply than several providers;²³

²² On the other hand, the different entry barriers found, according to Bain (1956), in traditional industrial economics (economies of scale, product differentiation, high capital needs, etc.) are not reliable proof of stable market power (cf., for example, Schmalensee, 1989). Von Weizsäcker (1980a; 1980b) shows, for example, that reputation and goodwill are effective ways of reducing insecurity, which can enhance social well-being. According to Stigler, the development of goodwill is not a barrier to market entry because it does not result in cost asymmetries between established firms and newcomers to the market.

²³ A natural monopoly exists when the cost function is subadditive throughout the relevant range. In the case of single products, economies of scale are sufficient for there to be a natural monopoly (e.g. Baumol, 1977).

- (2) at the same time the facility cannot reasonably be duplicated as a way of controlling the active provider, in other words when there is no potential substitute. This is the case when the costs of the facility are irreversible.

Consequently, network-specific market power in the hands of the established enterprise is only to be expected in those parts of networks which are characterised by a natural monopoly and irreversible costs. Although they are no longer relevant for the decision-making of the established enterprises, as far as potential competitors are concerned, irreversible costs are a crucial factor, insofar as they must decide whether to invest such costs in the market or not. Established firms therefore have lower decision-relevant costs than their potential rivals. This means there is room for strategic manoeuvring, with the result that inefficient production or profits no longer necessarily enable newcomers to enter the market. The market power of the firm that enjoys such a monopolistic bottleneck is therefore stable, even if all market players are fully informed, all users are prepared to switch to another provider, and small price adjustments have an effect on demand.²⁴

In the absence of irreversible costs, however, and as a result of the controlling effect of potential competition, even a natural monopoly does not possess stable market power,²⁵ regardless of the size of the relevant network operator's market share, because inefficient providers of non market-oriented services will be replaced by new entrants, owing to the pressure of competition. In this case there is no need for regulation to limit the active operator's control over the market.

The bottleneck theory does not deny the information problems encountered to varying degrees on real markets. Ex ante stable market power cannot be deduced

²⁴ This is the Bertrand Nash behavioural assumption based on the theory of contestable markets (cf., for example, Baumol, Panzar, Willig, 1982).

²⁵ In the absence of irreversible costs, there is no evidence in the case of a natural monopoly of market power capable of withstanding alternative behavioural assumptions (cf. Knieps, Vogelsang, 1982). Market power based on the Cournot-Nash assumption becomes immediately unstable with the switch to the Bertrand-Nash behavioural assumption. Action taken by competition authorities would therefore have to refer to behavioural assumptions that are difficult to verify in practice.

from the existence of information problems, however, insofar as markets tend to be efficient at (endogenously) developing institutions to overcome their information problems. Switching costs, which occur in many areas of the economy, are no explanation for monopolistic bottleneck situations either. Examples of switching costs include monthly or annual season tickets for concerts that cannot be transferred if the holder moves house, or the costs incurred by firms when employees leave as soon as they have learnt the ropes, etc. They are no justification for regulatory measures and can be left to the market's own problem-solving ability (cf., for example, von Weizsäcker, 1984; Tirole, 1989, Chapter 8). The existence of network externalities is no justification for sector-specific regulation either. The essential feature of such externalities is that for an individual the advantage of being part of a network depends not only on its technical specifications – its standard – but also on how many others are involved in it. Where there are positive network externalities, the benefit for the individual increases with the number of other network members, in other words the number of those using the same standard. In the absence of network-specific market power, negotiations between network operators can prove effective because both sides stand to benefit from the agreements.²⁶ In contrast, access to bottlenecks does present a need for regulation, given that network-specific market power allows for strategic manoeuvring that also hampers full enjoyment of positive externalities associated with access to the network (cf., e.g., Blankart, Knieps, 1995, pp. 288 f.).

Indeed, one of the essential features of the ability of competition to operate on the free markets for network services is that corporate strategies such as product and price differentiation, the build-up of goodwill, the development of an efficient distribution network, etc. can also be used for strategic purposes. Information problems (search costs, asymmetric information, etc.) can also play a role.²⁷

²⁶ This does not necessarily imply that the benefits of all network externalities are exploited. If, for example, consumers have heterogeneous preferences with respect to alternative technologies and gateway costs are significant, a competitive result of several network islands will arise (e.g. Blankart, Knieps, 1993, pp. 44-46).

²⁷ The Bertrand Nash assumption, based on the contestable markets theory, does not set out to deny the information problems encountered on real markets either. Stable market power cannot be deduced simply from the existence of information problems,

This must not lead to the opposite conclusion, however, namely that basically competition does not work on markets for network services, nor does it mean that general competition law should not be applied on these markets. What it does mean, however, is that, as on any other market characterised by organized competition, the burden of proof as to the existence of market power and as to whether such power is abused, rests with the competition authorities. In contrast to general ex ante regulation, such interference in competition should always be carried out only on a case-by-case and ex post basis.²⁸

3.2 Exploiting phasing-out potentials

One has to differentiate between markets which already are competitive and markets loosing the characteristics of monopolistic bottlenecks due to technological change.

3.2.1 Competitive long-distance networks

In the meantime the markets for long-distance telecommunications services are characterised by active and potential competition. Inefficient suppliers are replaced by less expensive ones because there is free market entry. Even when the market share of a service provider is high, inefficient production or services not geared to market requirements will soon lead to a considerable loss in market shares, because customers are not tied to a specific supplier and can react without delay to price cuts on the market. Excessive prices and inadequate network quality would result in switching to alternative suppliers, which would appear on

insofar as markets tend to be very efficient at (endogenously) developing institutions to overcome their information problems, for example, by building up goodwill. Conversely, stable market power is also to be found in natural monopolies with irreversible costs when all market players have all the information they need.

²⁸ In this context, the competition authorities must weigh up two potential sources of error. Firstly, false positives can occur when the authorities interfere in the competition process, even though competition is working and there is no need at all for action in terms of competition policy. Secondly, false negatives occur when the competition authorities fail to act, even though competition policy calls for action.

the market immediately, due to the possibility of free market entry. Thus there remains no regulatory need for disciplining the market power of alternative network providers.

The market for long-distance transmission capacity is competitive (cf. Laffont, Tirole, 2000, p. 98). There have been a large number of newcomers building transnational network infrastructure as input for Internet backbone capacity (cf. Elixmann, 2000, p. 7). Another possibility is to lease transmission capacity from several alternative providers of network infrastructure. In Germany, for example, a larger number of carriers possess their own long-distance infrastructures (cf. Knieps, 2004, pp. 9-11). The telecommunications transport capacity is readily available today from a variety of providers (cf. Kende, 2000, p. 25).

As a consequence, all markets on the retail level as well as those markets on the wholesale level focussing on long-distance networks should be excluded from the list of possibly regulated markets

3.2.2 Increasing competition within the local loop

Due to technical progress it is important to view the localisation of monopolistic bottlenecks in a dynamic context. Therefore, one objective in the definition of access conditions must be not to impede infrastructure competition, i.e. not to destroy incentives for either research and development activities or innovations and investments on the facilities level. This is the only way to reach a balance between service and infrastructure competition. Consequently, ever since the comprehensive opening of the telecommunications market, the pressure of innovation has increased in local networks, too. This has led to considerable technological variety (e.g. optical fibre, wireless networks, CATV networks, satellite technology) and a consequent increase in varieties of network access. As a consequence, broadband technologies lose the characteristics of a natural monopoly. In addition, effective platform competition becomes relevant, where alternative providers have complete control of all aspects of their networks and the subsequent services. Because of these rapid developments, the local loop facilities in

bigger cities and agglomerations are increasingly losing their character of monopolistic bottlenecks.

In order to gain a complete overview of the competition potentials it is necessary to not only focus on the traditional copper cable technology (in the local loop), but to also take into consideration the existence of alternative (broadband) access technologies. These alternatives vary within different parts of a country, but also between different countries, depending on the different histories of the networks and the strategies of the market participants etc. It is therefore important that the phasing-out potential should be properly identified by the regulators, including the emergence of new access alternatives in the relevant market.

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, there cannot be any doubt that the regulation of monopolistic bottlenecks has to be viewed in a dynamic context, so that the potential for phasing out sector-specific regulation in telecommunications can be fully exhausted. Network access possibilities depend on the peculiarities of different relevant geographic markets; in any case all relevant alternatives should be taken into account.

From this perspective the Commission's Decisions based on Article 7 of the Framework Directive again contain inconsistencies. Although wholesale access provided over alternative infrastructures is also considered to be part of market 12 (European Commission, 2003a, Annex I), the 26 Decisions of the Commission reveal a mixed picture. For example, although the Danish regulatory authority was convinced that broadband access via cable TV networks belonged to the wholesale broadband access market, the Commission was not, finally resulting in a notice of withdrawal.²⁹

²⁹ Notice of withdrawal, Case DK/2005/0182: Wholesale Broadband Access Market in Denmark.

3.3 Disaggregated application of sector-specific regulatory instruments

3.3.1 Minimal regulation of monopolistic bottlenecks

It is traditionally assumed that local networks constitute monopolistic bottlenecks, for which neither active nor potential substitutes are available. The EU regulation on unbundled access to the local loop proceeds from this assumption and concludes that there is a remaining need for regulation of the incumbent operator's local access network. To the extent and as long as local networks constitute monopolistic bottlenecks, ex ante regulation seems justified. Non-discriminatory access to bottleneck facilities has to be guaranteed (e.g. Knieps, 1997a, p. 328). Since unregulated tariffs would allow excessive profits to the owners of monopolistic bottlenecks, the instrument of price-cap regulation should be introduced (e.g. Beesley, Littlechild, 1989). Its major purpose is to regulate the level of prices, taking into account the inflation rate (consumer price index) minus a percentage for expected productivity increase. It seems 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 the competitive market forces.

Concentrating on the regulation of the "last mile" does indeed constitute the one remaining task of a tailored sector-specific market power regulation, to the extent that access alternatives are not available. Non-discriminatory access to bottleneck facilities must be guaranteed for all competitors.

3.3.2 Avoiding end-to-end regulation

Regulatory instruments can be differentiated according to whether they are limited to the bottleneck areas (disaggregated regulation) or applied globally (end-to-end), including the competitive segments (e.g. Laffont, Tirole, 2000, chapt. 4). Since the application of regulatory rules is not costless and may also be abused strategically to disturb market forces, the advantage of the disaggregated regulatory approach is the strict limitation of the regulatory basis to bottleneck

services. From an economic policy point of view, the use of ex ante sector-specific regulation involves massive interference with the market process and must therefore be supported by a well-founded justification. Even if, due to the nature of networks, bottleneck areas are complementary to the other parts of the network, there is no reason whatsoever for end-to-end regulation and a general use of regulatory tools. Both the findings of network economics and the experience with different network sectors show that tailor-made bottleneck regulation is the only way. Generally, a distinction has to be made between the existence of network-specific market power due to monopolistic bottlenecks and the question as to whether this market power is transferred to complementary parts of the market. Even if a transfer of market power from a bottleneck to other partial markets were incentive-compatible, this would not in any way mean that the bottleneck and the other partial markets belong to the same market. The basic idea of the disaggregated regulatory approach employed in network economics is the very fact that it is possible to distinguish between those parts of the network that constitute bottlenecks and those parts that are characterised by active and potential competition. The all-important task then is to ensure adequate regulation of bottlenecks in order enable equal opportunities for competition on the other markets.

This leads to the disaggregated regulatory approach which not only identifies network-specific market power properly as monopolistic bottlenecks but also designs a combination of regulatory instruments limited to the bottleneck (Knieps, 1997a, p. 331). Price-cap regulation limited to monopolistic bottleneck services (wholesale level) combined with accounting separation and technical regulation (e.g. number portability, preselection) is sufficient to deal with the problem of non-discriminatory access. Although access regulation cannot be perfect, it moves regulatory attention into the right direction.

3.3.3 No access holidays

In recent years the focus of regulatory attention has increasingly shifted towards the incentives for investment. From an economic point of view the relation between access pricing to monopolistic bottlenecks and its linkage with investment

incentives has to be analysed (e.g. Newbery, 2000; Valletti, 2003). In this context the role of access holidays has also been discussed. Access holidays mean a significant period during which an investor is free from access regulation. The idea is that such a holiday will increase investment incentives by allowing profits unhindered by regulatory intervention (Gans, King, 2003, p. 164).

Access holidays can only be a relevant concept if regulatory problems of network-specific market power still exist. With respect to market power two questions have to be considered. Firstly, does a new investment create network-specific market power? If not, sector-specific regulation is superfluous. Secondly, do new investments phase out the bottleneck nature of the existing network infrastructure? Since the comprehensive opening of the telecommunications market, the pressure of innovation has increased in local networks, too, leading to an increasing variety of network access products. This has led to a considerable disappearance of monopolistic bottlenecks within the local loops.

The basic argument in favour of access holidays is the negative incentive for investments caused by expected regulatory opportunism. Translated into the context of the truncation problem, stated e.g. in Gans and King (2003), ex post regulatory opportunism of the regulatory agency is taken as (exogenously) given. In the decision trees considered, the only asymmetry between ex ante and ex post is a random state of the world, which materialises between the ex post and ex ante periods, observable as common knowledge. Due to the sequential nature of investment decisions (ex ante) and regulation of access tariffs (ex post) a regulation-induced hold-up problem would arise. The truncation problem would result to reward only ex post successful projects, whereas the ex ante risks of project failure would not be compensated.³⁰ Due to the path-dependency of network infrastructures the hypothetical scenario of green-field approaches of new infrastructure networks overstates the ex ante risks, although the incentive problem for the gradual renewal of bottleneck infrastructures should not be ignored. In any case, from an investor's point of view all relevant ex ante risks

³⁰ Under certain conditions it can even be shown that regulated access prices equal to short run variable costs would result in a unique Nash-equilibrium and the utility would not invest (Newbery, 2000, pp. 34-36).

should be compensated. The really challenging task is therefore the design of a credible regulatory contract taking into account the problem of regulatory opportunism. Whereas network-specific market power should be disciplined by disaggregated regulation, at the same time the financial viability of the networks should also be granted.

The question arises whether access holidays are the adequate answer to the problem of regulatory opportunism. The starting point is how markets solve the problem of opportunism. Opportunistic behaviour between market participants can be credibly excluded by means of incentive compatible contracts. As long as all parties may benefit from the ex ante investment decisions, incentives occur to apply credible devices for dealing with ex post cheating behaviour. Under the assumption of complete information a well-specified contract can be designed between all parties involved creating incentives for ex ante irreversible investments and no ex post cheating incentives (e.g. Kleindorfer, Knieps, 1982). As Williamson (1983, p. 526) has shown, a security bond equal in amount to the irreversible investment would serve the purpose of a perfect hostage. In a world of incomplete information and subsequent incentives for idiosyncratic contracts (e.g. Williamson, 1979) the ex ante risk of investments cannot be perfectly determined. Consequently, perfect hostages to avoid opportunistic behaviour by the firm involved do not exist; nevertheless, adequate imperfect hostages can be developed (Williamson, 1983, pp. 527 f.).

Under the assumption of a welfare-maximising regulator in a similar way a complete incentive-compatible regulatory contract can be implemented. In particular, instead of postulating ex post regulatory power, under such circumstances of complete information it is feasible to design a complete regulatory contract ex ante such as to allow the compensation of the ex ante risk of irreversible investment. In a world of incomplete information again only an incomplete regulatory contract can be designed.

Since it is well known that regulatory authorities cannot be forced into welfare-maximising behaviour, the question arises whether opportunistic behaviour can be excluded by the design and implementation of adequate hostages. Within the

relevant institutional context it cannot be expected that the regulatory authorities can be disciplined by such an adequate hostage. Regulatory authorities as part of the bureaucracy cannot be fined as consequence of inadequate behaviour. As a consequence, it is only by means of a statutory constraint that opportunistic behaviour by the regulatory authorities can be disciplined.³¹ Therefore the regulatory agency has to be committed by statutes to allow the compensation of the ex ante risk of irreversible investment.

One cornerstone of the EU Directives is the financial viability of the networks. In the context of the EU Review on telecommunications the Access Directive indicates the necessity that: “National regulatory authorities shall take into account the investment made by the operator and allow him a reasonable rate of return on adequate capital employed, taking into account the risks involved”.³² Whereas the disaggregated regulatory contract has still to be implemented within the Review 2006, the regulatory authorities already have to take into account the statutory constraint of guaranteeing the financial viability of the network providers. Although even an omnipotent regulator is not able to calculate precisely the ex ante risk of investment under the situation of incomplete information, the statutory constraint of financial viability can be considered as an adequate substitute for the institutional infeasible (incomplete) hostage.

It has been shown that the problem of regulatory opportunism is not caused by the nature of ex ante irreversible investments per se, but is based on the more general problem that regulatory agencies cannot be committed to welfare-maximising behaviour. Therefore, the regulatory agencies have to be constrained by statutes, not only to enforce the disaggregated regulatory contract in order to properly discipline market power, but also to allow the compensation of

³¹ Regulatory theory has a long tradition of dealing with problems of incomplete regulatory contracts, including the problems of political control of regulatory agencies, involving policy makers, the agency, and the regulated firms (e.g. Goldberg, 1976; Spulber, Besanko, 1992; Sidak, Spulber, 1997).

³² 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, Art. 13/1), OJ L108/16, 24.4. 2002.

ex ante risks of irreversible investments. To conclude, the instrument of access holidays becomes superfluous.

4. Conclusions

The increasing complexity of EU regulation is resulting in a tangle of contradictory decisions and statements, involving also new markets, such as interactive cable television, Internet etc. Whereas in the past sector-specific regulation has been applied in a discretionary manner in order to correct the rules of the market game, the really challenging task for the future seems to be the development and implementation of statutory constraints for the regulatory authorities in order to guarantee a predictable regulation of market power. For this purpose the design and implementation of a disaggregated regulatory contract on the statutory level (EU Directives and national law) is derived, which should be an essential principle in the EU Review 2006. Its basic components consist of limiting regulation to monopolistic bottlenecks, exploiting the phasing-out potentials, and a disaggregated application of regulatory instruments. In contrast, the problem of opportunistic regulatory behaviour with respect to irreversible investments can be solved by the application of the already existing statutory constraint of the Framework Directive guaranteeing financial viability.

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