Bundesnetzagentur

Notes on consistent rates regulation within the meaning of Section 27 subsection 2 of the Telecommunications Act

– Final version –

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Table of Contents

0. Summary

As announced in the Federal Government's broadband strategy and the Federal Network Agency's strategic plan, the Federal Network Agency is focusing on further developing the principles governing consistent rates regulation, because consistency is of paramount importance for accomplishing the regulatory aims defined in the Telecommunications Act (Telekommunikationsgesetz).

The information provided in this document must also be seen in the light of the consultation draft "Key elements on the regulatory framework for the development of modern telecommunications networks and the creation of high speed broadband infrastructures" submitted by the Federal Network Agency in parallel on 20 May 2009. In addition, the Advisory Council at the Federal Network Agency emphasised at its meeting on 16 March 2009 that it attaches major importance to all measures aimed at safeguarding and expanding a sustainable telecommunications infrastructure, adding that this also includes creating a suitable regulatory environment.

With the consistency requirement set forth in Section 27 subsection 2 of the Telecommunications Act, the objective is to coordinate rates regulation measures in their entirety. This applies to the margin between wholesale rates and retail rates on the one hand, on which the Federal Network Agency published "Notes on margin squeeze within the meaning of Section 28 subsection (2) para 2 of the Telecommunications Act" back in November 2007 following consultation with the market participants. On the other hand, the consistency requirement also applies to the margin between different wholesale rates themselves. This is the focus of this paper.

To this end, the following conclusions are drawn:

- The margin between regulated wholesale rates along the value chain must be configured in such a way that providers operating on different levels of the value chain are able to operate efficiently, regardless of what business model they have chosen. The intention behind this requirement is to promote efficient investment in infrastructure and to safeguard fair competition.

- The actual conditions at both retail and wholesale level (e.g. market penetration, market share, network topologies, importance of economies of scale) must be

taken into account when determining the margins between rates.

- Examining whether rates are consistent hence also depends on what stage market development has reached. This highlights the fact that the procedure is a dynamic one. This is intended not only to ensure a reasonable margin with the retail prices charged by the company having significant market power (SMP company), but also that different wholesale rates are coordinated in a way that ensures incentives for efficient investments are created and maintained.

- Against this backdrop, the basic principle applies that margin squeeze needs to be prevented, particularly in order to ensure that business models based on more extensive investment in network infrastructure are not burdened by higher costs than a business model used by a competitor requiring lower investment.

- Charges that adequately reflect the costs of efficient service provision mimic the price that can be charged in a competitive environment and create efficient incentives for investment, as developments over the past eleven years have proven. In addition, the regulated company is permitted to generate a reasonable rate of return and to offset any costs incurred by special burdens. This ensures that the incumbent also has sufficient funds available to invest in infrastructure expansion and modernisation. In this, the criterion of the costs of efficient service provision has proven to be sufficiently flexible to enable all the relevant risks to be mapped in the return on capital employed and to enable new tariff structures.

- In view of the migration towards packet-switched networks, safeguarding consistency represents a special challenge, since it is an ever more complex and multi-dimensional task. Rates regulation measures should hence allow scope for evolution by facilitating business models that do not exist today but that may potentially be efficient in the future and in doing so, ensuring regulation will not act as a barrier to market entry.

- In the final analysis, safeguarding consistent rates regulation represents an ever more complex challenge. This applies all the more, considering that the margin between the different rates is a considerable factor in safeguarding adequate, efficient incentives for investment and fair competition. In this regard, the Federal Network Agency continues to see it as one of its key tasks to pursue the various

statutory goals in parallel by ensuring the decisions it takes also help to promote investment in efficient infrastructures by creating sustainable competition. This will simultaneously ensure that full use can be made of the innovative potential of communication and information technology applications.

1. Introduction

To create fair competition and to promote markets with sustainable competition continues to be a key objective of the Federal Network Agency's work. One way of achieving this is to ensure that rates regulation is consistent, as explicitly stipulated in the Telecommunications Act (TKG). The consistency requirement tells the Agency how to proceed in coordinating the content and timeframes of all its rates regulation measures. According to the explanatory memorandum for the draft Telecommunications Act, the aim is to ensure that “distortion of competition is avoided, for instance, by the existence of price squeeze”. The consistency requirement also envisages examining whether rates regulation measures are suitably proportionate to the aims defined in Section 2 subsection 2 of the TKG. In organisational terms, the consistency requirement manifests itself in Section 132 subsection 4 of the TKG which says that procedures are to be stipulated in the Federal Network Agency's rules of procedure imposing extensive coordination and information obligations on the Ruling Chambers and the departments concerned prior to decisions being issued.

The importance of the consistency requirement is also emphasised in the Federal Government’s broadband strategy, which affirms that the Federal Network Agency will take forward and discuss with the stakeholders the principles governing consistent rates regulation with a view to promoting efficient investment in infrastructure. The drawing up of explanatory notes is also mentioned in the Agency’s strategic plan.

Also, the Agency addressed this issue as soon as the current TKG entered into force, organising a workshop with representatives from the business and scientific community in November 2004. Furthermore, in August 2005 explanatory notes were published on matters relating to “bundling of products in an objectively unreasonable manner” and in December 2006 – following the evaluation of the hearing results - the final notes were published in November 2007 on margin squeeze. Both issues are closely linked to the consistency requirement.

Against this backdrop, on 20 May 2009, the Agency put a draft on consistent rates regulation up for discussion as Notification 292 in Official Gazette 9/2009. Eight statements were received from telecommunications companies and other organisations and published on the Agency’s website. These statements were first summarised and evaluated. The evaluation of the hearing will be published in parallel, given that

explanatory additions made on this basis have been incorporated into the statements.

These notes on the consistency requirement will outline the basics of consistent rates regulation in Chapters 2 and 3. Chapter 4 will focus on the margin between wholesale rates and retail rates, whereas Chapter 5 will focus on the margins between the various wholesale rates themselves. Last but not least, Chapter 6 will focus on safeguarding consistency in light of the conditions of technological change and Chapter 7 will provide a summary of the main conclusions of this document.

2. Basics and importance of the consistency requirement

In network industries in which rates are subject to regulation, consistent rates regulation makes a major contribution towards creating fair competition and promoting markets with sustainable competition. It is an essential prerequisite for enabling providers operating on all levels of the value chain to develop efficient business models, regardless of whether they are providing a service themselves or are procuring it from third parties. The consistency requirement was incorporated into the law for the first time in the Telecommunications Act, which entered into force in June 2004. The question as to what demands the consistency requirement actually places on rates regulation and hence on the Federal Network Agency is therefore of major importance. In the following, the term consistency will first of all be defined (Section 2.1), the actual content of consistency, the underlying economic rationality and the relationship between this requirement and other provisions that are relevant for rates will be discussed. Distortions of competition and potential conflicting aims will subsequently be discussed (Chapter 2.2).

2.1 Definition of consistent rates regulation measures

2.1.1 Definition

The consistency requirement is defined in Section 27 subsection 2 sentence 1 of the TKG: “The Federal Network Agency shall take care that rates regulation measures in their entirety are coordinated (consistency requirement).” The legal basis dictates that the

aim is to coordinate decision-making. This is to prevent inconsistent outcomes as a result of the Agency taking different decisions in different cases on issues that are in some way related.

The term “consistency” hence refers exclusively to rates regulation. Consistent rates regimes are characterised by the fact that they facilitate efficient business models. As a result, efficient providers are able to operate efficiently on or within all levels of the value chain, in other words, they are able to generate a reasonable rate of return on capital employed, regardless of the margins between the services they provide themselves and the services they procure from third parties. Consistent rates mean that investment decisions are taken in accordance with the principle of neutrality vis-à-vis the various business models. This means the choice of business model is made on the basis of economic rationality and not in response to price distortion.

As regards the actual scope of application of the consistency requirement, the wording of the law refers to rates regulation measures “in their entirety”, thus including all the measures regulated in the third chapter of the TKG governing market regulation. This means that the consistency requirement applies directly to the ex-ante approval of rates for access obligations imposed under Section 21 of the TKG and (by way of exception) to rates charged for retail services that are subject to approval, to measures involving ex-post regulation of wholesale rates and retail rates, rates charged for access services which telecommunications network operators have been obliged to grant pursuant to Section 18 of the TKG and ultimately also to the regulation of rates that are an integral part of standard products and services and rates that were fixed when the telecommunications network operators were obliged to grant access. Chapters 4.3 and 5.3.2 will outline the indirect effect unregulated rates charged by the SMP company may have.

2.1.2 Coordination of content

Coordinating the content of rates regulation is aimed at avoiding distortion of competition owing to regulation.

As far as coordinating the actual *content* of rates regulation measures is concerned - the substantive core of the consistency requirement - a look at how the provision came into

being will provide important information. According to the explanatory memorandum for the draft Telecommunications Act, the aim is to ensure that “distortion of competition is avoided, for instance, by the existence of price squeeze”.[1] The reference to price squeeze provides an example of what constitutes abuse, which - if established – suggests companies have engaged in anti-competitive pricing. Further examples of where exclusionary abuse may be presumed are given in Section 28 subsection 2 (dumping prices as per Section 28 subsection 2 para 1), and in Section 28 subsection 2 para 3 if an undertaking bundles its products in an objectively unreasonable manner. All these cases constitute potential distortion of competition which the establishment of the consistency requirement and targeted and coordinated rates regulation on wholesale and retail markets are intended to effectively counteract.

For cases of abuse, there are a number of different tests that can be carried out in order to establish whether there is a risk of efficient providers being squeezed out of the market and whether there are inconsistencies in the rates regime. The content-related coordination of rates regulation measures involves consistency between wholesale and retail rates on the one hand and consistency between different wholesale rates on the other.

2.1.3 Coordination of timeframes

As the wording suggests, the need to coordinate the timeframes of rates regulation measures implies that measures for implementation are also subject to coordination. In this context, one option would be to coordinate the length of time approved rates will apply for by way of ex-ante regulation, which the Federal Network Agency can influence by issuing relevant specifications in the approval. By the same token, this should also apply to the coordination of rates decisions subject to ex-post regulation.

Another aspect that is important in terms of coordinating the timeframes is that rates regulation practice must be consistent over time. This means that regulatory decisions taken at a later stage must not contradict decisions taken at an earlier stage or indeed deprive them of their basis.[2]

[1] Bundestag printed paper. 15/2316, p. 67.
[2] Cf. Monopolies Commission, Development of competition in the telecommunications sector 2005: Dynamism under new framework conditions, special expert’s report 43, Baden-Baden 2006, item 181.

Both issues will be discussed in Chapters 4.2 and 5.3.4 with regard to the margin between wholesale rates and retail rates on the one hand and the margin between different wholesale products subject to regulation on the other.

2.1.4 Relationship with the aims specified in Section 2(2) of the Telecommunications Act and other regulations

There is a further dimension to the consistency requirement, since it needs to be examined whether the rates regulation measures are suitably proportionate to the aims defined in Section 2 subsection 2 of the TKG. These include securing fair competition and promoting telecommunications markets with sustainable competition in services and networks, encouraging efficient investment in infrastructure and promoting innovation, as well as safeguarding user, most notably consumer, interests. Under the wording of this provision, rates regulation measures do not need to correspond to the aims defined in Section 2 subsection 2 of the TKG; rather they must be “suitably proportionate”. This implies considering whether one aim might take precedence over another. This type of consideration is taken within the framework of regulatory decisions when it is examined to what extent the relevant measure is suitable for accomplishing the regulatory aims.

In principle, there are two problematic areas that can be encountered when examining whether rates regulation measures are suitably proportionate to the aims defined in Section 2 subsection 2 of the TKG. On the one hand, the entire system of objectives could prove to be incompatible with a rates regime that is considered to be consistent. However, this possibility can be ruled out as the whole purpose of rates regulation is to help to accomplish the regulatory aims (e.g. to secure fair competition, encourage efficient investment in infrastructure and promote innovation, safeguard consumer interests). The way in which competition has developed proves that the current concept of regulation also meets the above-mentioned objectives (cf. also Chapter 3.2).

If (potential) conflicts arose between the regulatory aims, resulting in trade-off decisions being taken within the framework of a consistent rates concept, for instance, if different long-term objectives versus short-term objectives entailed different rates regimes, this would certainly have to be seen in a critical light. Tight limits regarding the extent to which customary market prices may deviate from the equilibrium price considered to be the ideal-typical price have also been set as a result of the additional requirement of

proportionality with the regulatory aims (cf. also Chapters 2.2.2 and 3.4).

In economic terms, consistency is perceived as a situation that enables competitors to position their products and services in the market on a level playing field so that they enhance welfare. This means a defined objective exists. However, no criteria have been defined as to how this objective is to be achieved. The consistency requirement therefore does not contain any independent, substantive criteria for rates regulation. Rather, Section 28 subsection 1 para 2 of the TKG stipulates that abuse is constituted, in particular, by the SMP undertaking levying rates which considerably prejudice the competitive opportunities of other undertakings in a telecommunications market, which generally involves inconsistencies in the rates regime. This applies, for instance, to price squeeze and to bundling of products in an objectively unreasonable manner, both of which are defined as abuse in Section 28 subsection 2 paras 2 und 3 of the TKG. Price differences within the meaning of Section 28 subsection 1 sentence 2 para 3 of the TKG may also be relevant in this context because they may be discriminatory.

The requirement to coordinate rates regulation measures is a formal principle. It says that two potentially conflicting rates regulation measures must be drawn up in a way that rules out any potential conflict. However, it does not stipulate how potential conflicting aims between the individual rates should be resolved. Nor does it answer the question of which conflicting measures need to be amended. Yet the consistency requirement does have some substantive content as it sets limitations for interpreting the criteria set out in Section 28 and Section 31 of the TKG.

2.2 Distortion of competition and potential conflicting aims

In Section 27 subsection 2 of the TKG, the demand raised by companies and associations in the telecommunications sector for consistent rates regulation was incorporated into the Act in the form of a consistency requirement. [3] Competitors of Deutsche Telekom AG claimed that they had been experiencing inconsistent rates regulation in the past few years which had caused distortion of competition. Price squeeze and a lack of wholesale services for the new retail products provided by Deutsche Telekom AG, above all in the area of broadband Internet access, were given as examples.

[3] Cf. Bundestag printed paper. 15/2316, p. 67.

The prime goal of introducing the consistency requirement was to avoid the above-mentioned effects of inconsistent decisions. On the one hand, this means the overall rates regulation regime has to be designed in a consistent way. All individual decisions must hence always be taken giving due consideration to all previous decisions. All in all, this requirement is directed at the Federal Network Agency, which is obliged to ensure that all decisions it takes on rates regulation are consistent.

A consistent rates regulation regime seeks to support all efficient business models and types of competition. This implies that both infrastructure-based competition and services competition must be covered by regulation in a way that facilitates business models based on them.

2.2.1 Potential distortion of competition caused by inconsistent rates regulation measures

Distortion of competition owing to inconsistencies can occur particularly in the form of price squeeze. This means, for instance, that the rates levied for a wholesale service may be higher than the price retail customers have to pay the company providing the wholesale service to its competitors. This considerably prejudices the competitive opportunities of other new providers. In order to attract retail customers, they would be compelled to offer services below cost, which is not possible in the long term.

Other types of consistency problem can arise if new providers enter the market using different business models, seeking access to the SMP company's wholesale services on different levels of the value chain. One example is that on the one hand there are companies which are able to offer their customers an overall package by making additional investment in own infrastructure because they have unbundled access to the local loop. On the other hand, there are providers who do not have any infrastructure of their own who purchase wholesale services from SMP companies at wholesale prices and then use them to sell individual services to customers. It is crucial to the success of these two different business models to establish what margin exists between the rate charged for access to the local loop and the wholesale price on which resale offers are based. Inconsistent rates reduce the success prospects of different business models, which ultimately results in distortion of competition. There may also be inconsistencies between rates levied for services at the same level of the value chain.

Inconsistent rates regulation leads to competitive processes being prevented from developing unhindered. This could limit the efficiency of competition so that, for instance, some business models would be rendered non-viable, investment decisions would be distorted, there would be the risk of (re-)monopolisation of markets and of certain business or competitive models being preferred or promoted owing to the wrong incentives. The latter may potentially lead to new providers entering the market who do not always operate efficiently. At the same time, there is a risk of the innovative potential offered by a competitive environment not being achieved. By contrast, consistently coordinated rates are key to the coexistence of different efficient business models on the basis of which innovative developments at different levels of the value chain are most likely to succeed, in turn strengthening dynamic efficiency.

2.2.2 Potential conflicting aims

Irrespective of the great importance of the consistency requirement, it needs to be taken into account that conflicting aims may arise. Consistency may cause conflict with the time needed to complete procedures. Consistent timeframes can cause problems, too. New technologies are enabling new business models. Regulatory practice should be able to respond to such developments in a sufficiently flexible manner in order not to slow them down.

Under the consistency requirement, regulation along the value chain is to be consistent in the sense of ensuring that no price squeeze (wholesale-retail) or margin squeeze (wholesale-wholesale) exists. In the literature it is noted that, in general, there is no clear definition of the term “value chain”. It merely refers to a phenomenon that is open to different interpretation, depending on what intention is being pursued. Another difficulty encountered is that, in principle, price squeeze and margin squeeze can occur at many levels of the value chain. Against this backdrop, it is questionable whether it will be possible to examine all combinations with the same level of intensity, maintaining a reasonable amount of effort. The aim is hence to achieve optimum, rather than maximum, consistency. [4]

Meeting the consistency requirement means striking the right balance between

[4] cf. Höffler, F., Consistency requirements in the new Telecommunications Act: requirements and conflicting interests, in: MMR insert 6/2005, p. 7f.

infrastructure competition and services competition from developments in the market itself. All providers have the relevant price incentives to make investments matching the level of the value chain they are operating at and to increase these investments gradually in order to reach the next rung of the investment ladder. This presupposes that customer growth facilitates this investment in the first place. Assuming that phased access products are available and that the price structure is consistent, there is an incentive for providers to invest as much money as needed to climb to the next level of the value chain (concept of the “ladder of investment”). However, providers are under no obligation to climb further rungs of the ladder. In order to promote efficient investment in infrastructure, it is sufficient to have a reliable, consistent rates regime based on the long run costs that will sway investment decisions.

Irrespective of this, situations can occur in which a trade-off between static efficiency and dynamic efficiency has to be considered. It may, for instance, be necessary to weigh up potentially conflicting aims if it is justifiable to take competition-specific incremental costs into account in order to prevent price squeeze. It is true that this could help to ensure fair competition; in exceptional cases, however, it could also prevent the SMP company from implementing certain rate reduction measures, adversely affecting user interests, at least temporarily. However, as promoting sustainable, competitive markets has positive effects on the economy as a whole and generates benefits for users in the medium to long term, conflicting aims as outlined above generally become relative. Nonetheless, it will ultimately be unavoidable in difficult cases to consider the trade-off between aspects of static efficiency and dynamic efficiency. This means that a loss of welfare in terms of static efficiency could be justified if there was a strong likelihood that this would be overcompensated for in terms of dynamic efficiency. Great importance is attributed to this aspect in the telecommunications sector because of its characteristic high rate of innovation. Experience gained over the past few years has shown that the impetus provided by competition to speed up the pace of technological progress has contributed in no small measure to enhancing macroeconomic efficiency.

3. Principles governing consistent regulation of network access rates levied by SMP companies

3.1 Wholesale offers that reflect demand

A range of wholesale services geared to meet demand provides the basis for a consistent rates regime. Key to developing and fostering competition in telecommunications markets that are typically characterised by economies of scale is the possibility alternative providers have of accessing all the wholesale services they need to be able to offer competitive products and services themselves. If no such comprehensive range of services develops naturally from market activity, regulatory intervention is needed to create access in order to facilitate fair competition. Pursuant to Section 21 of the TKG, the Federal Network Agency can oblige companies to grant other companies access that includes unbundling that reflects demand.

The majority of telecommunications service providers in fixed networks are dependent on wholesale services, regardless of what specific business model they opt for. This means competitors can only provide services on retail markets if they have access to the dominant provider's infrastructure. Access to wholesale services is hence indispensable.

Unbundled access to the local loop continues to be an important prerequisite for the provision of narrowband and DSL connections. This type of unbundling gives competitors the opportunity to offer a large number of telecommunications services. Fully unbundled access to the local loop comprises the line from the main distribution frame to the network termination point. If they did not have access to the local loop, competitors would have to install their own infrastructure right up to the end customers' premises. Access to the local loop means they "only" need infrastructure of their own up to the main distribution frame.

Line sharing is another wholesale service that is important for competitors. Customers requesting line sharing provide broadband access to end customers who continue to lease their subscriber line from Deutsche Telekom AG. Although the uptake of line sharing as a wholesale product for broadband access is relatively low in Germany compared to other European countries, demand has shown a marked increase since 2006.

Another wholesale service closes the gap in the value chain between access resale and unbundled access to the local loop. This involves various types of bitstream access with which the service is bought “beyond” the regulated company’s DSLAM (DSL Access Multiplexer), which means less own added value is needed to complete the end customer product.

Whereas alternative providers who have access to the local loop have to open up approximately 8,000 main distribution frames in order to provide a range of nationwide services, they only need to install 73 so-called broadband points-of-presence with bitstream access, in other words, these providers need a broadband backbone of their own but less own infrastructure than local loop-based providers.

Interconnection services represent other indispensable, regulated wholesale services. The implications of the migration to packet-switched networks on the basis of the IP Protocol for the range of wholesale services available will be discussed in Chapter 6.1.1.

3.2 Rates regulation in accordance with the criterion of the cost of efficient service provision

As a rule, the rates for access services, such as access to the local loop, are subject to ex-ante regulation. The costs of efficient service provision constitute the key cost criterion of the TKG. Pursuant to Section 31 subsection 2 of the TKG, the costs of efficient service provision are derived from the long run incremental costs of providing the service and an appropriate mark-up for volume-neutral common costs, inclusive of a reasonable return on capital employed, as far as these costs are required to provide the service. This means the costs comprise both the direct costs and the common costs. The direct costs include the capital costs comprising depreciation and return on capital as well as rental and operating costs. The investment costs are annualised with the capital costs. The aim is to fix the rates for services at a level that would develop in an efficient competitive environment. This means the SMP company has an incentive to provide its services efficiently and to develop hitherto untapped cost savings potential. Using the costs of efficient service provision as a yardstick is also sufficiently flexible to facilitate alternative tariff structures.

The costs of efficient service provision determined on the basis of the long run

incremental costs of providing the service are not fixed on low marginal costs in the short term, on the one hand. The capital valuation allows risks to be taken into account on the other. Pursuant to Section 31 subsection 4 of the TKG, in determining a reasonable return on capital employed the Federal Network Agency takes into account, in particular, the capital structure of the regulated undertaking, the situation in the national and international capital markets and the rating of the regulated undertaking in these markets, the requirements concerning the return on equity capital employed and the long term stability of the economic environment, also with a view to the situation as regards competition in the telecommunications markets.

Wholesale charges determined on the basis of long run incremental costs also fulfil other requirements. In respect of the cost of essential wholesale products, they place competitors roughly on the same footing as the integrated network provider by allowing them to participate in the regulated company's economies of scope and economies of scale via the concept of long run incremental costs. They also give network operators incentives to minimise their costs. This offers all competitors equal opportunities, in relation to the former monopolist, on downstream levels of the value chain right down to the end product.

The wholesale rates determined on the basis of the costs of efficient service provision also create optimum incentives for investment. Excessively high rates would favour investment that would not lead to any efficiency gains for the economy as a whole. If rates are too low, by contrast, investment activity tends to lag behind the level of efficiency of the economy as a whole. It is hence of paramount importance to set wholesale rates as accurately as possible in order to strike the right balance between infrastructure competition and services competition and to create the "right" incentives for efficient deployment and innovation.

Competitors who do not have any network infrastructure of their own or whose network infrastructure is incomplete are accorded access rights to the dominant, non-replicable network infrastructure by way of regulation, with the rates charged for this service being based on the costs incurred. It is, after all, these wholesale rates that decide whether the right investment incentives exist. Experience shows that the rates for access to the local loop represent a key parameter in promoting both intramodal and intermodal competition. Access is regulated on the basis of the costs of efficient service provision. Competitive prices are mimicked using the tool of long run incremental costs as the criterion.

The Federal Network Agency's decisions have created the prerequisites for encouraging complementary investments by competitors on downstream levels of the value chain and set the “right” price signals for decisions to invest in alternative infrastructures other than those belonging to Deutsche Telekom AG. This assessment has been confirmed by the experience of the past eleven years in which substantial investment has been made both by new market entrants and by Deutsche Telekom AG, owing to the implementation of diverse options for accessing the infrastructure. Regulation of unbundled access to the local loop on the basis of replacement values has led to competitors meanwhile opening up around 3,800 main distribution frame sites and investing fairly comprehensively in their own core and concentrator networks, continuing to do so to the present day. This means they are able to provide around 75 percent of the population in Germany with a full range of alternative products and services on a “one stop shopping” basis. Furthermore, cable operators have retrofitted their networks by investing in backhaul capability so that competition is developing between the various platforms (intermodal competition). In addition, a number of core network operators have progressively installed a nationwide core network as the interconnection regulations have evolved.

At the same time, the innovative potential has been fully utilised regarding communications and IT applications. Technical developments and innovations have enabled telecommunications services to be provided on the basis of ever higher bandwidths. This means consumers have a large number of innovative services such as video on demand, video telephony, IPTV and other convergent products at their disposal. Innovations have also been made in the area of contractual arrangements; the trend towards bundled products and services is thus catering for consumers’ desire to limit their costs. Certain business areas such as the online industry were only rendered possible in the first place by innovations in the telecommunications sector. Business models such as eBay, Amazon, Skype and StudiVz are just some of the examples that can be given in this context.

The criterion of the costs of efficient service provision hence creates adequate incentives for investment by competitors and the SMP company on the one hand while providing sufficient room for manoeuvre on the other. The Federal Network Agency is thus able to respond appropriately to changing conditions and to rise to new challenges particularly in applying the regulatory tools. This assessment is also compatible with the statements made by the Federal Government in its broadband strategy. Here it concludes that the existing framework offers sufficient flexibility to support the envisaged investments and

the development of new broadband infrastructures. It also believes that the framework offers every opportunity for growth-oriented and innovation-oriented regulation.

3.3 Consistent methods

Under the TKG there are a number of methods that can be used to determine the costs of efficient service provision. As far as meeting the consistency requirement is concerned, the Monopolies Commission proposed that consistent methods be the objective. This implies that the same system would be used to regulate wholesale rates and retail rates (individual regulation or price-cap regulation). Furthermore, it implies that different methods should not be used to determine the rates for wholesale services in the various business models. Accordingly, the costs of efficient service provision should not be determined on the basis of analytical cost models in one instance and on the basis of benchmarked markets in another.

The methods of rates regulation were specified in greater detail than before in the amendment to the TKG. In principle, cost statements only have to be submitted for rates subject to approval (Sections 33, 35 subsection 1 of the TKG); however, this information can also be supplemented or even replaced by benchmarking and/or analytical cost models. These options take the problem encountered in regulatory practice into account that cost documentation is not always robust. For ex-post regulation, Section 38 subsection 2 sentence 3 of the TKG explicitly says that an investigation must be carried out on the basis of the comparable markets principle, or benchmarking. By way of exception, the Federal Network Agency is permitted to proceed according to Section 33 of the TKG, i.e. requesting that cost statements be furnished. This differentiation of criteria and methods is intended to establish an analogy to the procedure adopted in antitrust practice under the Competition Act (Gesetz gegen Wettbewerbsbeschränkung, or GWB). Proceeding thus takes competitive trends into account, particularly in the area of retail markets. This in itself makes it questionable whether full consistency can be achieved in the methods used.

In principle, the Federal Government agreed in its comments on the 2004/2005 Activity Report by the Federal Network Agency and with the special report by the Monopolies Commission that the aim should be consistent methods. However, it did make explicit reference to the major practical problems likely to be encountered if the Monopolies

Commission's ideas are implemented consistently. The practicality of the proposals is therefore called into question. The regulatory aims and the need for reliable and predictable decisions must be taken into account as part of these considerations.[5]

The Federal Network Agency will abide by the approach it has adopted, which is to examine rates on the basis of benchmarking studies or cost models if the cost information available proves to be insufficient. Section 35 subsection 1 sentence 2 of the TKG makes explicit provision for this option. In doing so, the lawmakers themselves have taken the circumstance into account that, in the interest of planning certainty, it should also be possible to approve rates if and when it is not possible to derive the costs of efficient service provision from the cost documentation submitted and there are alternative possibilities available for doing so. Assuming this to be the case, it would be not only disproportionate, but actually diametrically opposed, to the regulatory aims set forth in Section 2 of the TKG if the approval sought was not granted, at least partially.[6] Crucial is the criterion to be applied, and the method for determining the costs must be oriented to this.

4. Consistent regulation of the margin between wholesale rates and retail rates

After the basics of consistent rates regulation were outlined in Chapters 2 and 3, the aspects that have proven to be worthy of discussion in practice will undergo a more differentiated analysis in the following. Chapter 4 will begin by examining the margin between wholesale rates and retail rates, whereas Chapter 5 will focus on the margin between different wholesale rates.

In Chapter 4.1, the ability of efficient competitors to replicate the rates of the SMP company will be discussed. Replicability is deemed an integral part of the coordination of the content of rates regulation measures – at least where the wholesale rates and relevant retail rates are still subject to sector-specific regulation. First of all, the main

[5] Comments by the Federal Government on the 2004/2005 Progress Report by the Federal Network Agency for Electricity, Gas, Telecommunications, Post and Railway and on the special report by the Monopolies Commission "Development of competition in the telecommunications sector 2005: Dynamics under a New Legal Regime" and "Development of competition in the postal sector 2005: insisting on old privileges", p. 6.

[6] Cf. Ruling 4b-07-001/E by the Ruling Chamber 19.01.07 of 30 March 2007 on the approval of monthly rates for the provision of access to the local loop, p. 16.

points of the Notes on margin squeeze published in November 2007 (Chapter 4.1.1) will be set out. Then the issue of determining the (specific) costs of efficient competitors will be dealt with (Chapter 4.1.2), using the example of the IP bitstream decision as an example. It will then be discussed whether a company must have significant market power in the retail market (Chapter 4.1.3). The importance of the decision handed down by the Court of First Instance in the spring of 2008 in the case against Deutsche Telekom AG will be discussed (Chapter 4.1.4). Last but not least, some of the controversial positions of major importance in the decision handed down in the T-VPN Kommunen Rheinland-Pfalz case will be discussed (Chapter 4.1.5).

In Chapters 4.2 and 4.3 some aspects will be addressed that have not (yet) been a real focus of the discussion but which are likely to gain momentum in future. This includes the requirement explicitly set forth in Section 27 subsection 2 of the TKG that the Federal Network Agency shall coordinate the timeframes of its measures for wholesale and retail offers (Chapter 4.2). Finally, issues of (prioritised) intervention at wholesale and retail level will be discussed (Chapter 4.3).

4.1 Replicability by efficient competitors / coordination of content

One of the key aspects of consistent rates regulation is the need to strike a balance between wholesale rates and retail rates in order to ensure that efficient competitors can replicate the rates of the SMP company. Assuming that alternative providers have access to the relevant wholesale products, this is, in principle, ensured if the margin between the rate the SMP company charges its competitors for access to the infrastructure and the relevant retail rate is sufficient to enable efficient companies to generate a reasonable rate of return on capital employed in the retail market. Under these conditions, the presumption of abuse under Section 28 subsection 2 para 2 of the TKG would not hold true for the company levying rates that considerably prejudice the competitive opportunities of other undertakings in a telecommunications market within the meaning of Section 28 subsection 1 para 2 of the TKG. In this case, it can basically be assumed that there is consistency between the wholesale rates and retail rates charged pursuant to Section 27 subsection 2 of the TKG, meaning that they are proportionate to the aims set forth in Section 2 subsection 2 of the TKG.

Against the backdrop of the issues that are likely to arise regarding the tightening up of

this provision, the Federal Network Agency launched a dialogue early on with representatives of the business and scientific community in order to ensure the highest possible level of transparency and planning certainty. Some of the key aspects were discussed at a "Consistency requirement and rates regulation" workshop on 29 November 2004. The results were published on 13 June 2005 as an insert in the trade journal ("MultiMedia und Recht" (Multimedia and the Law) (edition 6/2005).

In a next step, the Federal Network Agency published notes on issues relating to the "bundling of products in an objectively unreasonable manner" within the meaning of Section 28 subsection 2 para 3 of the TKG in August 2005.[7] On the basis of the experience gained up to then, notes were drawn up on margin squeeze within the meaning of Section 28 subsection 2 para 2 of the TKG in December 2006, incorporating specific questions. These were then put up for discussion. On the basis of these discussions, clarifications were incorporated into the comments.[8] The final version was published in November 2007.[9]

4.1.1 Key elements regarding the application of price squeeze tests

The aim of the Notes on margin squeeze published in November 2007 was to help develop a common understanding of the underlying problems and to outline guidelines for the application of what are now termed price squeeze tests.

The key statements of the Notes can be summed up as follows:

– In construing Section 28 subsection 2 para 2 of the TKG, according to which abuse is presumed if the margin between the price the SMP company charges competitors for an access service or facility and the corresponding retail price is not enough to enable an efficient undertaking to achieve a reasonable return on capital employed in the retail market, in principle, efficient competitors must be used as the

[7] Notification 196 in the Official Gazette 15/2005 of 10 August 2005 and on the Federal Network Agency's website at http://www.bundesnetzagentur.de/cln_1932/DE/Sachgebiete/Telekommunikation/RegulierungTelekommunikation/Konsistenzgebot/SachlichUngerechtfertigteBuendelung/SachlUngerechtfBuendlg_node.html

[8] Notification 441 in Official Gazette 24/2006 of 20 December 2006

[9] The assessment of the hearing and the final version of the Notes on margin squeeze within the meaning of Section 28 subsection 2 para. 2 of the Telecommunications Act were published as Notification 940 in the Official Gazette 22 of 14 November 2007 and were also published on the Federal Network Agency's website at http://www.bundesnetzagentur.de/cln_1932/EN/Areas/Telecommunications/TelecomsRegulation/ConsistencyRequirementMarginSqueeze/consistencyrequirementmarginsqueeze_node.html

point of reference.[10]

– It is not the Federal Network Agency that assesses the various business models on the market but the competition which allows a distinction to be made between successful and less successful models. In this regard, the term “efficient competitor” should not be interpreted as synonymous with an efficient business model.

  As regards the aim to safeguard fair competition and to promote sustainable competition on markets in rural areas too, pricing would not be permissible if it enabled competitors to generate a margin allowing them to achieve a reasonable rate of return on capital employed in isolated areas only. However, this does not mean that competitors must be able to replicate the rates of the SMP company on a nationwide basis for each individual business model, but merely that efficient competitors in their entirety must be able to compete with the dominant provider on a nationwide basis – on the basis of various access services.

– As the retail prices new providers charge are dependent to a large extent on the rates of the SMP company and thus there is uncertainty about the margin between the competitors' prices and underlying costs, it is extremely difficult to draw reliable conclusions on whether the rates charged cover costs, if price squeeze exists or even if the SMP company is engaging in abusive pricing simply by comparing the products and services provided by competitors operating in one and the same market.[11]

– There is no universal answer to the question whether price squeeze tests should be limited to individual markets or should also be applied to rates levied across all markets; this question can only be answered if the actual competitive conditions

[10] This much was conceded by Deutsche Telekom AG whose legal representatives state on page 26 of the document issued on 30 July 2008 in lawsuit 21 K 568/08 (T-VPN Kommunen Rheinland-Pfalz): “Even within the framework of Section 28 subsection 2 para. 2 of the Telecommunications Act, it is not the situation of the petitioner [T-Systems Business Services GmbH], but of an efficient competitor that is authoritative. It is therefore crucial whether this efficient competitor is able to generate a reasonable rate of return on capital employed on the retail market. This needs to be determined on the basis of the business conditions of the competitor and not of the petitioner.”

[11] This view is meanwhile also shared by the Federal Cartel Office whose statement of 24 January 2008 within the framework of the Decision taken in the proceedings against T-VPN Kommunen Rheinland-Pfalz included the following, among other things: “The Decision Division also holds the view that the comparable market principle cannot not apply to this particular case as there is no evidence that any suitable, comparable market that is open to competition exists. Notwithstanding this, it is noted that from the anti-trust perspective, no competitive offer can be considered in the same relevant market, only that of a different (as a rule geographical) market could be considered (in this case an international market).”

prevailing in the market are taken into account. In this context, using efficient competitors as the reference point is of paramount importance. As the key question behind price squeeze tests is deemed to be the ability of efficient competitors to replicate certain rates, the starting point for price squeeze tests is based, by and large, on the business models of efficient competitors.

– With regard to bundled products encompassing both regulated and unregulated services, it needs to be examined first and foremost in what way market power might be transferred or leveraged.[12] This involves examining whether efficient competitors of the SMP company are able to offer the bundled product on comparable terms, and focuses clearly on the replicability of prices for bundled products.

4.1.2 Specifications regarding the determination of the (specific) costs of efficient competitors

The consultation on the Notes on margin squeeze demonstrated considerable need for discussion among stakeholders as to how the Federal Network Agency defines the term "efficient competitor" and how it plans to determine the costs incurred by efficient competitors. For this reason, clarifications have been incorporated into the final version of the position paper, highlighting the fact that efficient competitors do not necessarily have to be able to replicate, on a nationwide basis, retail products and services of the SMP company in every business model or on the basis of every wholesale service. The application of such tests should not therefore automatically assume companies are operating on a nationwide level, but should take market-specific conditions into account. However, this does not mean business plans which have actually been implemented by specific competitors should be used as the reference point either. This could lead to circular arguments being used in the event that – derived from this – the tests were based on relatively restrictive assumptions. Nevertheless, with regard to the efficiency analysis enshrined in the law, the calculations should certainly reflect information about what thresholds need to be achieved in relation to customer numbers, market share and/or volume of traffic in order to be able to build and operate elements of the infrastructure efficiently.

[12] Cf. also ERG (09) 07 "Report on the discussion of the application of margin squeeze tests to bundles".

In this context, some market players urged the Federal Network Agency to provide a precise, independent definition in the regulations of the term “efficient competitor” with a view to rendering this approach operational. However, it soon became apparent that any attempt to find a universal definition of the term “efficient” company gave rise to a large number of questions not least in view of the rapid pace of technological progress in the telecommunications sector. In this respect, it appears problematic to find a universal definition for “efficient companies” with all the commercial characteristics this implies (e.g. size of the network, number of customers). The general view is that the required efficiency should be determined independently of company-specific circumstances. Nonetheless this should not happen without reference to real market conditions, as they are more likely to reflect the actual levels of efficiency that can be achieved by competitors.

Against this backdrop, there is much to suggest that normative specifications should be limited to a foreseeable period, as this is most likely to ensure that the current competitive situation and the anticipated development of competition can be taken adequately into account. If a decision requires, say, an assumption of the level of infrastructure deployment required, it is less important what an efficient competitor might be able to achieve over the long term, but rather what investment an efficient company can realistically be expected to make in the foreseeable future or in the period under review. If it is conceivable, for instance, to develop the access areas in their entirety and it is economically viable to do so - under certain general conditions - but this does not appear realistic in the foreseeable future under the dictates of efficiency, the non-realistic view should be reflected in the parameters chosen.

Within the framework of the possibilities outlined here, in principle, it appears to be reasonable to take the regional variation in demand for wholesale services into account on the one hand, while taking the increasingly diverging technical possibilities of creating products into account on the other, provided this does not call the operational ability of the market squeeze test into question.

One of the main prerequisites for taking the specific costs of efficient competitors into account is that there is a sufficiently valid database available. To this end, the Federal Network Agency conducted a comprehensive market data survey as part of the decision adopted in the spring of 2008 on the rates charged for IP bitstream access. Relevant data was needed, for instance, to determine the following parameters: average customer

retention period, average telephony patterns (low users, heavy users), churn rate, weighting of various bandwidth categories of DSL lines, costs incurred by IP bitstream customers for transport through the IP backbone network as well as the average number of square metres covered by competitors in collocation areas.

In addition, the data collected also created the basis for the (average) number of DSL customers and the (average) number of main distribution frame sites an efficient competitor would be assumed to have. The averages created using these parameters, which are characterised by a high level of dynamic efficiency, apply to the particular approval period. In this regard, a future-oriented approach has been adopted. The anticipated development of competition was incorporated into the calculations in order to accommodate heightened efficiency requirements on the one hand. On the other hand, the costs of efficient competitors were approximated on the basis of actual market conditions in order to minimise any distortions resulting from the Federal Network Agency issuing inadequate regulations.

Taking different contractual arrangements for wholesale rates into account in price squeeze tests

When different types of contracts exist for wholesale rates, issues specific to price squeeze tests arise. One problem that can arise is that two or more wholesale rates may be charged for a wholesale product that differ in terms of the level of risk shouldered owing above all to the different contractual durations, but these wholesale rates have to be compared with just one (weighted) retail price. In principle, the options available are to use the lower wholesale charge, the higher wholesale charge or a value somewhere in between as the reference point for the price squeeze test.

If the price squeeze test were carried out on the basis of the lower wholesale charge, i.e. the charge involving the longer contractual duration and hence the higher risk for the customer, the less rigorous test criterion could have the undesired effect of efficient companies that had chosen a shorter contractual duration and hence a lower risk, possibly not being able to generate a reasonable rate of return in the retail market. This means price squeeze would exist for the higher rate reflecting the shorter duration. Companies looking to generate a reasonable rate of return on their product would then be forced by regulatory decision to choose a longer contractual period. This may also hold true of service-oriented providers under certain conditions. However, it is infrastructure-oriented competitors above all that may have an incentive to choose a

shorter contractual duration, as this enables progressive own investment in infrastructure.

If, by contrast, the price squeeze test applied the higher wholesale charge, the SMP company could be disadvantaged. This is because competitors deciding on the higher-risk variant might then be able to offer the corresponding retail product at a lower price than the regulated company that is bound by the price squeeze test –- provided their own value added is otherwise calculated as favourably as that of the SMP company. This would probably reduce the investment incentives for the SMP company.

Thus it is necessary to find a strategy that best avoids these two undesired effects. It would seem appropriate to orient the wholesale charge in the test to the behaviour actually observed in the market. This would mean assuming a form of risk-sharing for the efficient competitor that suitably reflects given market conditions. Specifically, no "either-or" decision should be taken in respect of the two tariff options – particularly as there are other price and duration constellations available in between the two extremes described - but a mix of the eligible charges can be applied. With this approach, a particular level of risk (sharing) for an efficient competitor is not set in the abstract as a regulatory standard in advance, but is derived from the market itself. This accommodates the requirement that price squeeze tests apply a particular value for the wholesale service, a value that, in turn, provides *implicit* information about the risk sharing assumed. The considerations outlined here therefore merely elaborate on the approach adopted in other contexts in which deciding what constitutes an efficient competitor is done with reference to the conditions in the market at the given time. This is entirely consistent with the discretionary scope provided by Section 28 of the TKG.

4.1.3 Question whether a company must have SMP in relation to the “relevant” retail product

The Notes on margin squeeze do not specifically address the issue whether the application of such tests is based on the assumption that the company has a dominant position in the retail market or that the relevant rates are subject to regulation. For clarification purposes, it is pointed out here that it is sufficient for the implementation of tests if the wholesale product is subject to regulation. However, this is not necessary for the retail rate in question.

The wording of the provision ("the margin between the price the SMP public telecommunications operator (...) charges for an access service or facility and the corresponding retail price") does not discernibly assume that the retail price is subject to regulation. (It does not specifically say: "…and the corresponding retail price that is subject to regulation").

The possibility of applying the price squeeze test in this case, however, results in particular from the overarching purpose of the rates regulation provisions: the philosophy of the TKG is that retail rates should be subject to regulation only when / for as long as regulation of the wholesale products and the remedy of carrier (pre)selection would not achieve the regulatory aims set out in Section 2 subsection 2 (cf. Section 39 subsection 1 of the TKG). The underlying idea is, observing the fundamental rights of the regulated company, to regulate its rates only to the extent necessary to accomplish the regulatory aims. If, accordingly, (only) wholesale rates are regulated, this regulation must, however, be effective in accomplishing the regulatory aims and hence be able to leverage all the tools available – as in this case, carrying out price squeeze tests. The provision set forth in Section 35 subsection 3 of the TKG, according to which approval is to be granted wholly or in part when the rates meet the requirements of Sections 28 and 31 in accordance with subsection (2) and there are no grounds for denial as set out in sentences 2 and 3, serves the same purpose. This means the lawmakers also ensured these requirements are met by defining what constitutes abuse in Section 28 of the TKG.

This intention of the lawmakers to give preference to effective regulation of wholesale rates over regulation of retail rates would be counteracted if establishing that price squeeze existed when regulating wholesale rates also required the retail rates to be regulated.

With regard to the overarching purpose of the rates regulation provisions, it must therefore be possible to use the unregulated market price of a retail product or a retail market in which no provider has a dominant position as the reference point if price squeeze is established during wholesale rates regulation.

Moreover, this approach and this regulation in the TKG is compatible with general competition law.[13] In its decision of 2 July 2007, the European Commission emphasised

[13] This is confirmed by the Federal Cartel Office in its most recent decision pursuant to Section 32c of the Act against Restraints of Competition on the pricing of co-called mass call services (hereinafter also: MABEZ services). It says in Decision B 7 – 11/09 of 6 August 2009 in margin number 51: "In this particular case, abuse cannot be ruled out just

the following in relation to the use of price squeeze by Telefónica:

> Even though it is not necessary according to case law to ascertain that Telefónica has a dominant position on the retail market, the Commission has completed its investigation and established that it is indeed dominant in this market.[14]

Whereas price squeeze tests can be carried out regardless of whether the relevant retail services are subject to regulation, the question remains what conclusions need to be drawn if price squeeze is found to exist even though the company does not have a dominant position in the retail market and there is no need for regulation in this market. For in these cases, possibilities of regulatory intervention only exist in respect of the wholesale products regulated. This can, however, provoke conflict with the criterion of the costs of efficient service provision (cf. also Chapter 5.3.3).

4.1.4 Decision of the Court of First Instance in the Deutsche Telekom AG case of 10 April 2008

On 21 May 2003, the European Commission issued a decision to the effect that Deutsche Telekom AG was abusing its dominant position on the relevant market and imposed a fine of €12.6 million. The Commission arrived at the conclusion that Deutsche Telekom AG had been infringing Article 82 sentence 2 lit. A of the EC Treaty since 1998 by charging competitors excessively high rates for wholesale access services in the local loop, effectively preventing competitors from accessing the local loop. It therefore held that DT AG had engaged in abusive practices by creating price squeeze.[15]

The Court of First Instance confirmed the fine imposed against Deutsche Telekom AG in its Decision of 10 April 2008 and agreed with the approach and findings of the European Commission.[16] Against this backdrop, it appears to be useful to take a closer look at

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because the company is not dominant on the downstream market. For margin squeeze to constitute abuse pursuant to Article 82 of the Treaty Establishing the European Community, Sections 19 and 20 of the Act against Restraints of Competition, it is both necessary and sufficient if the company is dominant on the upstream market. This also ensues from the general principles governing prejudice of the competitive opportunities of other undertakings and the transfer of market power"

[14] Decision of the Commission of 2 July 2007 in relation to proceedings regarding pricing practices in violation of Article 82 of the EC Treaty (Case COMP/38.784 – Wanadoo España/Telefónica), item 6.

[15] Decision of the Commission on 21 May 2003 in relation to proceedings regarding pricing practices in violation of Article 82 of the EC Treaty (Case COMP/C-1/37.451, 37.578, 37.579 — Deutsche Telekom AG), Official Gazette L 263, p. 9 *(published under reference number K(2003) 1536)*

[16] European Court of Justice, ruling of 10 April 2008 - case T271-03.

some of the key aspects of the Commission's decision.

Point of reference for price squeeze tests

Some competitors have argued that a price squeeze test based strictly on the market also reflects the EU Commission's practice in its local loop Decision of 21 May 2003 against Deutsche Telekom AG. The Commission argued in respect of combined costing for price squeeze tests that it could not be presumed that all competitors had the same income structure as the incumbent operator and hence the possibility of combined costing using their different sources of income. Deutsche Telekom AG's request that the revenue generated from telephone lines and telephone calls be part of the overall analysis was declined by the EU Commission – in the competitors' opinion.

Taking this line of argument into consideration, it must be conceded that the EU Commission's view in the above-mentioned Decision indicates that it defined the reference point for price squeeze tests more narrowly. Yet this does not appear absolutely necessary if it is borne in mind that the Commission's statements referred to one specific case that, in turn, has to be seen in the context of particular market conditions and a relatively early phase of market liberalisation. This means it is not possible to transfer this to other cases or to draw any general conclusions for the application of price squeeze tests.

In other respects, some of the Commission's comments show that it certainly thought about the extent to which competitors were capable of imitating Deutsche Telekom AG's combined costing strategy.[17]

With regard to these considerations, the Commission made explicit reference to the trend in retail rates for call services outlined in the Annual Report 2001 published by the

[17] Decision of the Commission on 21 May 2003 in the Case COMP/C-1/37.451, 37.578, 37.579 — Deutsche Telekom AG, Official Gazette L 263:
"If a competitor might be interested in ordering unbundled local loops in order to offer access services to its customers, DT forces it to offset its losses on access services out of higher revenue on telephone calls, as DT itself does. But in recent years call charges have fallen substantially in Germany (101), so that competitors often have no realistic possibility of offsetting one price against another." (Margin item 103; cf. in this context in particular also Footnote 101)
"Since the complainants form a heterogeneous group whose members use different business models, one cannot be convinced by DT's sweeping argument that market entry is open to competitors because access and call services can be offset against each other (174), as such offsetting has clearly not allowed the majority of the complainants to cover their costs or offered them the prospect of generating profits." (Margin item 183).

Regulatory Authority for Telecommunications and Post. This in turn allows the conclusion to be drawn that the Commission did not limit itself to a narrow approach but also considered the ability of competitors to replicate combined tariffs comprising access and call services in its examination (at least in a supplementary capacity).

In addition, it must also be remembered that the Commission carried out its investigations at a time when competition was far less developed and it was far more difficult to estimate competitors' calculation options. That there was hesitation in including combined costing in the considerations at the time should not automatically lead to the conclusion that such a restrictive application of price squeeze tests should still be deemed necessary, given the market conditions prevailing today.

In this regard, it is crucial that the point of reference for price squeeze tests reflects the market behaviour of efficient competitors on the one hand and safeguards the necessary operational efficiency of the tests on the other. If these requirements are met, it will ultimately be ensured that examining whether abuse exists under Section 28 subsection 2 para 2 of the TKG will actually indicate whether a company is considerably prejudicing the competitive opportunities of other undertakings in a telecommunications market within the meaning of Section 28 subsection 1 para 2 of the TKG. There is no indication against the backdrop of the above EU Commission decision or by the confirmation of this decision by the Court of First Instance that any such interpretation of the price squeeze tests is not compatible with provisions of European law.[18]

Underlying level of efficiency

The European Commission calculates price squeeze on the basis of the rates and costs of a vertically integrated SMP company, without taking the specific situation of competitors into account. The Commission and the Court of First Instance have hence indicated that the criterion for equally efficient competitors is an economic operator who operates just as efficiently as the SMP company. In the view of the Court of First Instance there would be a risk of infringing the general principles of legal certainty if any other approach was adopted. If the lawfulness of an SMP company's pricing policy depended on the specific situation and, in particular, on the cost structure of its competitors, which are generally not known to the SMP company, the latter would be unable to assess the

[18] cf. specifically the evaluation of the statement received about the Notes on margin squeeze within the meaning of Section 28 subsection 2 para. 2 of the Telecommunications Act, published on 14 November 2007, p. 35 – 37.

lawfulness of its own behaviour.

In this context, there is much to suggest that a distinction should be made between penalty proceedings and price squeeze tests, which aim primarily to prevent distortion of competition. It seems justified to penalise the SMP company in penalty proceedings only if it can be held responsible for the abuse. This in turn presupposes that it has all the information needed to determine that price squeeze exists in the first place. By contrast, it seems expedient with future-oriented price squeeze tests to focus on the perspective of efficient competitors, whose costs must not exceed the costs incurred by the SMP company in the long term because the disadvantage of fewer benefits from economies of scope and scale is compensated for by having an optimised network structure and operational processes from the outset.

4.1.5 Definition of the term “efficient competitor” in the light of the discussion about different framework agreement arrangements

Eleven competitors pointed out in a common statement in response to the Federal Network Agency's strategic plan for 2008 that the Agency, in taking forward both the “Notes on margin squeeze within the meaning of Section 28 subsection 2 para 2 of the TKG” and the “Notes on bundling of products in an objectively unreasonable manner (Section 28 subsection 2 para 3 of the TKG)” should go into the market developments whose major relevance for the effectiveness of retail rates regulation had become evident in the “Retail services in the framework agreement of T-VPN Kommunen Rheinland-Pfalz” case. They said these recent market developments, not known at the time the Agency’s Notes were being drawn up and commented upon, referred to telecommunications lines including additional services being sold on a fixed price basis by grouping customers together via T-VPN framework agreements and that the criteria of a regulatory review using the legal term “efficient competitor” could be controversial.

The respondents pointed out that the competitive implications of the current marketing strategy using T-VPN framework agreements with fixed price models (“port price model”) were significant. They claim that it is rendered difficult, if not impossible, for competitors to replicate these offers in a number of respects: for a competitor that is unable to replicate what may be a state-wide or nationwide T-VPN framework agreement and may be unable to do so because its business focuses on a specific region, the question arises

whether it would be possible to make a competitive offer in the first place in relation to the specific retail agreement concluded. Even the need to purchase wholesale services (in particular interconnection, local loop) from Deutsche Telekom AG frequently makes it impossible to design a competitive fixed-price offer for the customers the companies are keen to attract. Furthermore, the competitors claim that it is difficult even for companies operating on a federal state or nationwide basis to replicate a T-VPN framework agreement including the requisite bundling of customer agreements. Owing to the fact that products and services were sold on the basis of a fixed price, they say these framework agreements pay off if there is a high legacy customer base, offering the potential for cross-subsidisation. Potential for cross-subsidisation exists above all where competitive offers are few and far between and the uptake of the range of products and service available is lower than in competitive regions.

They also claimed that, generally speaking, it is only the companies belonging to Deutsche Telekom AG that are able to cross-subsidise competitive offers in conurbations to the detriment of less frequently used products and services in other regions owing to their market share. This type of cross-subsidisation cannot be a guideline for an “efficient competitor” within the meaning of Section 28 of the TKG. The term “efficient competitor” should not therefore apply to all customer agreements concluded via the T-VPN agreement. Rather, it should refer to the actual customer agreement which rival companies will be competing with.

In relation to the arguments outlined above it is noted first of all that it is not clear why alternative providers should not, in principle, be in a position to offer their customers a competitive range of products and services based on fixed prices also on the basis of volume-based wholesale products. While it is true to say that any such calculation of a flat rate involves a multitude of uncertainties if it applies to a smaller number of customers, current market conditions prove that a large number of the competitors of the SMP company are also offering flat rates.

Regardless of this, the basic question arises how framework agreements calculated on the basis of nationwide figures (e.g. for the *Sparkasseninformationszentrum*) should be dealt with in regulatory terms if the terms and conditions of any such framework agreement are such that it would be impossible even for efficient competitors to replicate economically an offer that is limited to certain regions owing to regionally diverging usage characteristics.

It is noted first of all that the inability to apply combined costing on a nationwide basis should not in itself be rated as a lack of efficiency. This applies in particular if competitors operating at regional level were systematically excluded from availing themselves of certain cross-subsidisation possibilities, for instance, because unlike the incumbent, they were unable to generate an additional margin in certain areas in which they face no (significant) competition.

By contrast, one aspect in favour of adopting a nationwide approach when examining replicability is that it may be necessary for certain organisations and institutions to offer products and services on a nationwide basis, taking customer preferences into account. It appears problematic to rule out this option for regulatory reasons owing to the questionable ability of regional carriers in general to compete. This applies all the more so in view of the fact that Section 27 subsection 2 para 2 of the TKG stipulates that the Federal Network Agency shall coordinate the timeframes and the content of its measures and consider whether each measure is proportionate to the aims according to Section 2 subsection of the TKG, which includes, not least, representing consumer interests.

In addition, it must also be pointed out that adopting a regional approach in price squeeze tests would raise considerable questions regarding their operationability since orienting tests to specific competitors and the usage profiles of their (potential) customers means a large number of different tests would have to be carried out, not to mention all the delimitation difficulties this would involve. This in turn highlights the fact that the SMP company would face major planning and legal uncertainty if this approach was adopted. It must also be borne in mind that the SMP company is not familiar with the usage patterns of its competitors (which is deemed relevant based on this assumption) and can therefore hardly be expected ex-ante to take this into account in its calculations.

There is a possibility that the consideration outlined above is of a purely theoretical nature. Up to now, the Federal Network Agency has no evidence to prove that nationwide combined costing compared to the calculations used by regional providers is causing systematic distortions of competition. It is true to say that usage behaviour and usage intensity tend to vary greatly between metropolitan and other areas – particularly in the commercial field. Nonetheless it is not clear on the basis of examinations carried out so far why this should result in major differences in the average utilisation of channel capacity that is crucial for costs. For instance, a random check carried out on the cost differential along the lines of urban-rural differences is not suitable for substantiating this

theory.

The conclusion that can hence be drawn is that although it cannot be ruled out in individual cases that a regional focus might be chosen for price squeeze tests, the operationability of this price squeeze test would have to be guaranteed on the one hand and any competition-promoting effects resulting from it would have to appear justified in order to compensate for any negative effects this may have on consumer interests.

4.2 Consistent timeframes for wholesale and retail products and services

The requirement set forth in Section 27 subsection 2 of the TKG to coordinate the timeframes of rates regulation measures indicates that the timeframes of all measures to be taken need to be coordinated. In practice, this has, however, proven to be extremely difficult because although some wholesale products are subject to ex-ante approval, retail services tend to be subject to ex-post regulation only. Nonetheless, if facts that constituted reasonable grounds for suspecting abusive practices became known, this would be outside the control of the Federal Network Agency, meaning it would be virtually impossible to synchronise the timeframes of regulatory intervention at wholesale and retail level.

Another aspect of coordinating the timeframes of regulatory measures refers to the consistency of decisions over time and the issue to what extent new information may call earlier decisions into question. The decisions which are supposed to be consistent are not always taken simultaneously. In many cases, decisions taken at a later stage have the benefit of information that was not available when decisions were taken at an earlier stage. In these situations, it must be ensured that the new information is taken into account without causing inconsistencies that could be avoided. This task refers on the one hand to cases in which a new company requests access at a later stage. The introduction of a new business model could potentially lead to changes in the basics of the current business model, ultimately meaning that the basis for regulatory decisions taken in the past may now be seen in a completely different light. Competition in the retail market can, for instance, be strengthened in such a way that price squeeze occurs that was not there before owing to the anticipated response by the SMP company to the new competitor. This is where there may be a conflict between earlier access regulation decisions, the new access regulation decision and the adjustment of retail rates to the

new situation on the market.

Another aspect of coordinating the timeframes of regulatory measures is addressed in Section 39 subsection 4 of the TKG. The requirement set forth in this Section says that any undertaking having significant market power in a retail market and obliged to grant access to a service and/or facility according to section 21 which includes components that are likewise essential to a service offer in the retail market shall be obliged to submit at the same time as its planned rates measure for the retail service an offer for the wholesale product which meets, in particular, the requirements of Section 28. If the SMP company is planning to introduce a new retail rate, it must submit at the same time a relevant wholesale product that meets, in particular, the requirements of Section 28 of the TKG – unless it is already providing any such product. This is intended to ensure that non-discriminatory wholesale rates are provided at the same time. The obligation to submit wholesale rates and retail rates simultaneously ensues directly from the wording, and the obligation to charge non-discriminatory rates ensues from the reference made to Section 28 of the TKG. Furthermore, the specification set forth in Section 39 subsection 4 of the TKG is geared above all towards ensuring rate structures of wholesale and retail products can be compared. Where the SMP undertaking fails to submit any such wholesale offer, the Federal Network Agency may, “without further examination, forbid it from asking the retail price”. This enables competitors to place rival retail products on the market in good time. This counteracts the problem of decisions on rates regulation being potentially inconsistent owing to the fact that there are no wholesale products available when an SMP company brings a new retail product onto the market.

4.3 Relationship between intervention on wholesale and retail markets

With the amendment to the European regulatory framework in 2002 and to the national Telecommunications Act in 2004, priority was given to regulation at wholesale level in order to minimise the regulation of retail rates. This means that pursuant to Section 39 subsection 1 of the TKG, the Federal Network Agency can only subject the rates of SMP companies that offer telecommunications services on the retail market to rates regulation if facts justify the assumption that the obligations in the access area or on carrier (pre)selection would not accomplish the regulatory aims set forth in Section 2 subsection 2 of the TKG. The overarching purpose is to ensure that rates are subject to

regulation only to the extent needed to accomplish the regulatory aims while observing the regulated company's fundamental rights.

According to the explanatory memorandum of Section 37 of the draft Telecommunications Act, this means that the regulation of retail rates can only be considered as a "last resort". This wording is taken from recital 26 of Directive 2002/22/EC of 7 March 2002 (Universal Service Directive) which, however emphasises that there is a risk that an SMP undertaking may act in various ways to inhibit entry or distort competition, for example, by charging excessive prices, setting predatory prices, compulsory bundling of retail services or showing undue preference to certain customers. As the distortion of competition outlined above also includes price squeeze, it becomes clear that the regulator must still be able to impose regulatory retail rates measures on the SMP company, particularly in these cases involving distortion of competition. In Germany, this has been implemented by way of sector-specific ex-post regulation pursuant to the provisions set forth in Section 28 of the TKG, which says that any price squeeze can be characterised as abuse regardless of whether the company has SMP in the respective retail market (cf. also Chapter 4.1.3).

In the next step the question arises what regulatory conclusions should be drawn if and when price squeeze is identified. Adjustments made at the level of wholesale and retail rates would be one way of eliminating price squeeze. It is true to say that the statements made above suggest that, in principle, priority could be given to ex-ante regulation of wholesale rates. Eliminating price squeeze by reducing wholesale rates based on the principle of the costs of efficient service provision runs the risk of considerably distorting competition and of sending the wrong price signals in terms of the incentive to invest (cf. also Chapter 5.3.3). Moreover, it says in the explanatory memorandum on Section 29 of the draft TKG: "By contrast, it is not permissible to set prices that are below cost by way of regulation against the will of the SMP company."

This enables the conclusion to be drawn that price squeeze should basically be eliminated by making adjustments to the retail rates. However, this will always raise major questions when not all components of the relevant retail products and services are subject to regulation. As broadband retail services have been exempted from regulation up to now, although they typically form part of commercially available bundled products, this means that it would generally be impossible to enforce increased retail rates by way of regulation. Adjusting the prices of individual components that are still subject to

regulation such as narrowband access services, by contrast, would not solve the problem either as the relevant company cannot be obliged to take any such price increases into account within the framework of the bundled products it sells.

If the Federal Network Agency, when regulating the wholesale rates of an SMP company, then established that one of these rates, despite being based on the costs of efficient service provision, would lead to efficient competitors only being able to offer the retail products and services of the SMP company themselves by tolerating price squeeze, it would first need to examine the extent to which this was likely to prejudice other companies' competitive opportunities. If the retail product was an insignificant niche product – measured against market share and growth rates – the relevance to competition of the price squeeze and hence the presumption of anti-competitive practices could be denied by virtue of the lack of relevance of the detriment to competition. If, on the other hand, the relevance of the price squeeze to competition was confirmed, the Agency would really have to introduce ex-post price controls on the basis of the criteria in Section 39 in conjunction with Section 28 of the TKG in order to prohibit the company from anti-competitive charging. However, this option exists only on retail markets found to warrant regulation, in other words, the Federal Network Agency would have to carry out the three-criteria test.

In the final analysis, this means that if the Agency scales back regulation of the retail market, it can orient its action in price squeeze tests to the non-regulated market price for a retail product. Yet regulating the relevant rates and monitoring abuse cases is only possible under general competition law. Alternatively, in order to secure consistency, the Agency could perhaps consider issuing an order that economic gain be surrendered in these cases (Section 43 subsection 1 of the TKG).

5. Consistent regulation in terms of the relationship between different business models

In addition to the consistency between wholesale and relevant retail rates discussed in Chapter 4, Section 27 subsection 2 of the TKG also addresses the consistency of various wholesale rates amongst each other. In the following, a few basic considerations about the consistency of different wholesale rates will be outlined and specified using the

relationship between ULL and IP bitstream (Chapter 5.1) as an example. In Chapter 5.2, the issue of a proportionate relationship between services competition and infrastructure competition will be addressed in the light of the application of a margin squeeze test at wholesale level as part of the decision on IP bitstream access rates. Last but not least, other aspects such as the consistency of regulated and unregulated wholesale products will be discussed in Chapter 5.3.

5.1 Main features of consistent rates regulation of various wholesale services

With a view to the aims of safeguarding undistorted competition and of promoting efficient investment in infrastructure, it is a matter of coordinating the margin between regulated wholesale rates across the value chain in such a way that companies operating on the various levels of the value chain can operate efficiently. This also implies that it is important to strike a proper balance between services competition and infrastructure competition.

In a rates regime defined thus, the margins between the rates basically correspond to the differences in costs on all levels of the value chain, enabling each provider to take economically sound decisions based on their business and investment plan, without having to engage in strategic practices. Rates must hence be regulated in such a way that they facilitate fair competition between the different providers and also between the different business models.

In recent times, the questions arising from this and the complexity of these questions has markedly increased, owing to the rise in the number of competing business models. Special importance is attached in the current discussion to determining exactly what constitutes the “right” balance between the rates for fully unbundled access to the local loop, line sharing, bitstream access and line resale.

Major price reductions for T-DSL resale products (wholesale DSL) triggered this discussion in 2007. They reduced the margins between the rates for wholesale services used by infrastructure-based providers. According to competitors who have their own infrastructure, this put pressure on the margins in the retail market and therefore lessened the financial incentive for them to build infrastructure of their own. In order to counteract this, infrastructure-based competitors have demanded that they be accorded

higher gross profit margins as resellers in regulatory terms, given the higher investment costs and risks and longer depreciation times they face. Similarly, companies oriented more to infrastructure demanded that, also regarding the introduction of IP bitstream access, they be accorded a so-called consistency and infrastructure mark-up for cost accounting purposes, in order to avoid thwarting incentives to invest. By contrast, alternative service providers naturally emphasise the fact that they are specialists in identifying the needs of the market and in translating these needs into products, which explains why they should not be placed at a disadvantage vis-à-vis infrastructure providers whose core competencies involve network operations.

Against this backdrop, the key considerations regarding a consistent wholesale rates regime will be outlined in the following:

Recent developments show that a substantial number of companies that have entered the market since liberalisation are expanding their own infrastructure little by little.[19] Both the size of these investments and the share of investment that can be characterised as potentially "sunk" is increasing in the process.[20] Under this premise, it is important that wholesale rates not only leave a sufficient margin between the retail rates charged by the SMP company – as outlined in Chapter 4 –, but that the margins between the wholesale rates themselves create and maintain incentives for efficient investment. When IP bitstream was introduced, for instance, it was important to ensure that no rates were set that would have prevented efficient investment from being made in the infrastructure right down to the level of main distribution frames.

When determining what represents the "right" margin between rates for different wholesale products along the value chain, the regulator is inevitably drawn into a tricky area, which can be demonstrated using the margin between access to the unbundled local loop and IP bitstream access (IP-BSA) as an example. The margin must be kept large enough to avoid artificially limiting the expansion of efficient local loop demand on the one hand, but it must not be too large on the other, as this could lead to inefficient investment in infrastructure and excessively high retail prices – especially in regions

[19] cf. for instance the gradual increase in DSL retail products and services based on the local loop provided by competitors and the simultaneous decline in resale-based DSL retail products and service provided by competitors. 2008 Annual Report of the Federal Network Agency, diagram "DSL Lines in Operation", p. 71, Bonn, 2 April 2009.

[20] cf. ERG: "Report on Best Practices on Regulatory Regimes in Wholesale Unbundled Access and Bitstream Access", ERG (07) 53, 2008, item 3.1.

where there is less competition.[21]

With a view to determining the margin between the rates charged for access to the local loop on the one hand and IP bitstream access on the other, the differences between economies of scale and economies of density and the resulting costs per user must be borne in mind. They are substantiated above all by the fact that the start-up investment (e.g. for collocation and the necessary infrastructure expansion) which, for the most part, represents sunk costs, plays a much more important role for local loop users than for IP bitstream access users. One of the main problems therefore is that efficient competitors requiring access to the local loop are typically unable to benefit from economies of scale and economies of density to the same extent as the former monopolist. This means in particular that the SMP company is generally able to offer and produce IP bitstream access at lower rates than its competitors, unless the latter are willing to tolerate losses.

In order to accommodate this, a reasonable level of economies of scale that an efficient network operator can realistically be expected to achieve must be taken into account when consistent rates are set. Current market conditions such as the DSL penetration rate and the number of customers using DSL lines as well as the intensity of competition must be considered as well. After all, the underlying level of network deployment for a specific decision-making period is derived from this, aspects of economic efficiency being borne in mind too.

This information highlights the fact that this approach is a dynamic one, as examining whether rates are consistent also depends on the stage market development has reached.

It ensues specifically from these considerations that the rates charged for IP bitstream access must correspond at the very least to the rates charged for access to the local loop plus the incremental long run costs of efficient service provision for IP bitstream access. Under the above-mentioned dynamic approach, the following needs to be reviewed at regular intervals

– how the costs of the relevant infrastructure elements and service components change as the technology evolves,

[21] cf. ERG: “Report on Best Practices on Regulatory Regimes in Wholesale Unbundled Access and Bitstream Access”, ERG (07) 53, 2008, item 3.2.

- what economies of scale need to be taken as a basis for efficient network operators, taking DSL penetration and the average market share of an efficient competitor into consideration, and

- how network deployment and the development of other access areas can be expected to unfold against this backdrop.

5.2 Striking a reasonable balance between services competition and infrastructure competition

The Federal Network Agency pointed out on page 50 of its Ruling Chamber Decision BK3c-08-004/E 04.03.2008 of 13 May 2008 that if margin squeeze exists, "considerable anti-competitive effects [would] arise as a result of a business model based on greater investment in infrastructure incurring higher costs than a competitor's business model with less investment. Any such margin squeeze would hence presuppose that the costs of the wholesale IP bitstream product would be as low as or as high as the costs of other wholesale and resale products of the incumbent [DTAG], rendering the business model requiring higher investment in infrastructure no longer viable".

This approach could also be perceived as an expression of the above-mentioned rationale or statutory requirement of creating and maintaining incentives for efficient investments. Owing to the requirement set forth in Section 27 subsection 2 sentence 2 of the TKG that the Federal Network Agency should consider whether rates regulation measures are proportionate to the aims defined in the TKG, this approach is also stressed in the context of the consistency requirement.

It follows specifically from this that margin differences which may exist between the various business models can only be deemed permissible in one direction. If negative margins were created, this would probably destroy incentives to invest in infrastructure. If, by contrast, positive margins existed in favour of the infrastructure-based providers, this would appear to be more acceptable, considering the uncertainties associated with the investments made. Nonetheless, it must be ensured that fair competition between the different business models is not affected and that the right balance is struck between services competition and infrastructure competition.

The risk of imbalance would exist if there were substantial differences in margins, if only because it is not clear how the different risks of the different business models can be rated qualitatively and, especially, how they can be quantified. It must be borne in mind that the margins that can be realised by infrastructure-based providers and the uncertainties involved may vary greatly owing to the above-mentioned dependence on market share and economies of density.

In addition, the fact that it is difficult to predict over what period of time investments in infrastructure will pay off, given the dynamic pace of technological development, is likely to be seen as a major uncertainty factor for infrastructure-based providers. In principle, the question arises whether this should also be reflected in calculations regarding the activity of an efficient competitor. If it is deemed appropriate to do so, it needs to be examined, with a view to the various uncertainties involved, to what extent they should be taken into account via the determination of conservative assumptions for particular cost-relevant parameters (e.g. regarding depreciation periods).

Nonetheless, infrastructure-based providers also benefit from greater opportunities in a competitive environment as they are able to generate more added value of their own and more importantly, have more room for manoeuvre (in addition to price, for instance, they can also offer different levels of quality) as well as greater independence (e.g. control over the network).

Taking different wholesale contractual arrangements into account in margin squeeze tests

If different types of contract exist for wholesale rates (e.g. different durations), specific questions arise for margin squeeze tests. A distinction needs to be made between two cases. The first is one in which there may be variants of all the wholesale charges relevant to the particular margin squeeze test, according to the level of risk assumed. In the – conceivable – second, there is one charge for some of the wholesale products included in the test which is not offered for different contractual periods, and different charges for other wholesale products according to the different contractual periods signed up to. In the first case, the margin squeeze test must compare the wholesale charges applicable for the same contractual period and thus the same level of risk. This is not quite so easy in the second case. As a general rule, a margin squeeze test should reflect the principle that a business model based on higher own investment should not be

burdened with higher costs than a competitor's business model based on lower investment. Thus in this case the proper approach would be to compare the lowest charge in the wholesale service requiring less own investment with the highest charge in the wholesale service requiring higher own investment. This will make sure that companies investing more are not disadvantaged in relation to companies investing less, regardless of the risk chosen.

5.3 Further aspects of consistent rates regulation

5.3.1 Consistency between wholesale rates based on bottom-up and retail-minus methodologies

Resale obligations are useful for developing service-based competition in SMP markets. Resale obligations should be imposed if they are rated as essential for competition. Whenever resellers are able to buy network services at a reasonable wholesale discount on the retail prices charged by network operators, competition develops between (integrated network) operators and service providers that is deemed optimum for the national economy.

Retail-minus regulation on the one hand and bottom-up cost regulation on the other, if applied correctly, i.e. if the minus element and the efficient costs are determined properly, are not just compatible with each other, but actually complement each other by creating a suitable environment for maximising efficiency potential and for boosting competition. In this sense, the co-existence of both approaches can be deemed consistent and useful also with regard to accomplishing the regulatory aims.

Companies planning to enter the market are thus able to choose the most efficient type of entry. In areas in which it is meaningful for companies to build their own infrastructure, they will continue to do so. This can be explained in particular by the fact that having their own infrastructure gives companies better opportunities for designing their own products and services.

Under Section 21 subsection 2 para 3 of the TKG, the Federal Network Agency may, having regard to subsection (1), require SMP public telecommunications network operators to grant access on a wholesale basis to particular services offered by the

operator as offered to end-users, for the purpose of resale by third parties in their own name and for their own account.

Pursuant to Section 30 subsection 1 sentence 1 of the TKG, the Federal Network Agency needs to consider on the one hand whether it deems it appropriate to impose rates regulation in order to meet the regulatory aims pursuant to Section 2 subsection 2 of the TKG and if so, whether it considers it more appropriate to order ex-post regulation or ex-ante regulation. In the event that ex-ante regulation is imposed, the resale-specific criterion is regulated in Section 30 subsection 5 of the TKG. It stipulates the following:

> "Charges levied by an SMP public telecommunications network operator for access on a wholesale basis to particular services offered by him for the purpose of resale by third parties in their own name and for their own account shall, in derogation of section 31(1), be calculated on a retail-minus basis to allow an efficient provider of telecommunications services to achieve a reasonable return on capital employed in the retail market. The charges shall be equivalent to the costs of efficient service provision at least."

If the Federal Network Agency considers ex-post regulation of rates to be appropriate, regulation is oriented to Section 38 of the TKG. Ex-post regulation examines whether the rates are compatible with the criteria defined in Section 28 of the TKG. In this case, the criterion specific to resale set forth in Section 30 subsection 5 of the TKG does not apply.

In the event that ex-ante regulation is imposed, the following aspects need to be examined in greater detail when resale rates are specified:

– Characterisation of efficient providers of telecommunications services

  Pursuant to Section 30 subsection 5 sentence1 of the TKG, charges levied by an SMP public telecommunications network operator for access on a wholesale basis to particular services offered by him for the purpose of resale by third parties in their own name and for their own account shall, in derogation of section 31(1), be calculated on a retail-minus basis to allow an efficient provider of telecommunications services to achieve a reasonable return on capital employed in the retail market. Here, no assessment of an individual company's degree of efficiency is made; simply an abstract assessment of efficient practices is intended.

When defining the term “efficient provider”, the specific question is whether companies selling retail products exclusively on the basis of resale products should be used as the point of reference or companies selling retail products on the basis of different wholesale products (e.g. unbundled access to the local loop, bitstream, line resale). In this regard, the question arises whether it is necessary for companies whose business model is based exclusively on resale to be able to achieve a reasonable return on capital employed or whether it is sufficient for them to be able to achieve a reasonable return on capital employed on the basis of numerous wholesale services. This question needs to be answered in each individual case based on whatever business model efficient competitors are using. If it is anticipated that efficient competitors will be unable to sell their retail products exclusively on the basis of resale wholesale products, it is sufficient if a reasonable return on capital employed can be achieved on the basis of numerous wholesale services.

– Determining the retail market under review

In addition, it is of paramount importance for defining the retail-minus how the retail market is defined. There is much to indicate that the definition of the retail market under review should be oriented to the interpretation of the retail market within the framework of price squeeze tests pursuant to Section 28 subsection 2 sentence 2 of the TKG[22], as this passage has identical wording in the two provisions referred to (…”[to enable] (.....) to achieve a reasonable return on capital employed in the retail market”). The relevant retail market cannot be defined in general terms, it can only be defined taking the competitive conditions actually prevailing on the market into account. As efficient competitors providing telecommunications services are to be able to achieve a reasonable return on capital employed in the retail market, the retail market needs to be defined, by and large, on the basis of the business models used by efficient competitors. In each individual case, one single rate, but also a combination of rates, if necessary, needs to be assessed.

– Calculating the retail-minus

[22] cf. Notes on margin squeeze within the meaning of Section 28 subsection 2 para. 2 of the Telecommunications Act, Chapter 4, published as Notification 940 in the Official Gazette 22 of 14 November 2007 and on the Federal Network Agency’s website, cf. Footnote 9.

The retail-minus basis is to be calculated in such a way that efficient providers of telecommunications services can achieve a reasonable return on capital employed on the retail market. The retail-minus price is derived from the avoidable costs.

– Minimum level of costs of efficient service provision

Section 30 subsection 5 sentence 2 of the TKG ("The charges shall be equivalent to the costs of efficient service provision at least") specifies a minimum level for the charges referred to in Section 30 subsection 5 sentence 1. These are the costs of efficient service provision of wholesale services by the SMP company. It ensues from the consistency requirement that the retail-minus cannot be so high that the resale price is lower than the costs of efficient service provision. Section 30 subsection 5 sentence 2 of the TKG is intended to protect the SMP company as well as competitors that have their own infrastructure. Companies using business models that are not limited exclusively to the resale of services provided by the SMP company but that offer telecommunications services on the basis of other access services pursuant to Section 21 of the TKG in combination with their own infrastructure, are obliged to pay the SMP company at the very least the rates corresponding to the criterion of the costs of efficient service provision. If a reseller bought an overall product from an SMP company at a price that was below the costs of efficient service provision, this would place competitors with their own infrastructure at a disadvantage over resellers.

Under Section 30 subsection 5 sentence 2 of the TKG, the costs of efficient service provision incurred by the SMP company must be determined on the basis of the latter's remaining net added value. If the rate determined is below the costs of efficient service provision pursuant to Section 30 subsection 5 sentence 1 of the TKG, this is first and foremost a question of the level of retail rates charged, as retail rates would have to be below the costs of efficient service provision too for this case to materialise.

The question of an efficient provider of telecommunications services and of how to define the relevant retail market arises in a similar form in an investigation of anti-competitive conduct under Section 28 of the TKG that would apply if resale charges were subject to ex-post regulation (cf. also Chapter 4.1.1). Tests to ensure resale charges are calculated on a retail-minus basis to allow an efficient provider of telecommunications services to

achieve a reasonable return pursuant to Section 30 subsection 5 of the TKG on the one hand and Section 28 subsection 2 sentence 2 of the TKG on the other should – wherever possible – be carried out in an analogous manner in order to rule out any inconsistencies.

Nonetheless, owing to the other completely different approach, it cannot be ruled out that wholesale services calculated on the retail-minus basis are priced higher than they would be in a bottom-up calculation based on the costs of efficient service provision. This effect is likely to occur in particular when retail rates are above a cost-oriented level. This can, in turn, lead to companies not being able to offer products and services on the same terms and conditions as infrastructure-based competitors exclusively on the basis of resale. It is not possible to make a general statement here to what extent this would be (over)compensated for by benefits regarding the nationwide availability of certain resale products and - all other things being equal – lower capital expenditure. Rather, this depends on a number of factors such as the company's strategic orientation, the general technical conditions and the conditions prevailing in the market.

5.3.2 Consistency between ex-ante and ex-post wholesale rates

Whereas rates are determined on the basis of the costs of efficient service provision in ex-ante regulation – as outlined in Chapter 3 -, an increase in the level of rates in ex-post regulation is limited by the less stringent yardstick defined in Section 28 subsection 1 para 1 of the TKG. It states that abuse is constituted, in particular, by the undertaking levying rates which prevail solely as a result of it having significant market power in the particular telecommunications market. The TKG does not specify when exactly rates prevail solely as a result of a company having significant market power in the particular telecommunications market. According to general antitrust criteria it depends whether the rate comes about because of the company's SMP and is in all probability higher than it would have been had there been efficient competition. In Cologne administrative court case law, the comparative price determined by the Federal Network Agency does not, however, represent the threshold for abuse. As abuse of dominance implies wrongdoing, there has to be a considerable margin between the comparative price and the prices concerned. It is only the comparative price increased by this de minimis differential that

constitutes abuse.[23]

The methods (generally) used vary too. Unlike (ex-ante) regulation, which is based initially on the cost documentation available to the Federal Network Agency, the price that mimics competition is determined for ex-post regulation primarily by benchmarking. And unlike in determining the costs of efficient service provision, the assumption for Section 28 subsection 1 para 1 is the highest non-discriminatory competitive price established in benchmarking.[24]

Against this backdrop, it would seem obvious at first glance that the co-existence of wholesale rates that are subject to ex-ante regulation and ex-post regulation might lead to consistency problems. If, for instance, a rate requiring companies to have less own infrastructure is regulated according to more lenient criteria than the rate charged for a wholesale product that can only be used by competitors who have a comprehensive infrastructure of their own, issues relating to potential distortion of competition could arise. Here, it must be remembered that the criterion defined in Section 28 subsection 1 para 2 of the TKG must be heeded equally in ex-ante regulation and in ex-post regulation. It says that abuse is constituted, in particular, by the undertaking levying rates which considerably prejudice the competitive opportunities of other undertakings in a telecommunications market. On this basis, price squeeze and margin squeeze tests must be used in an analogous manner, regardless of whether this involves wholesale products that are subject to ex-ante regulation or ex-post regulation or the margins between them. This narrowly limits the potential for distortion of competition particularly if margin squeeze tests are carried out in relation to other wholesale products whose charges are based on the costs incurred (or on wholesale products whose charges are based on the costs of efficient service provision). By proceeding thus, the scope for setting charges for an access service (also one regulated ex post) will be greatly restricted mainly on the premise that price squeeze and margin squeeze tests are carried out along the value chain, in both directions, and the corresponding charges are at competitive levels.

[23] Cf. Ruling handed down by Cologne Administrative Court 1 K 8432/04 of 15 September 2005, margin number 2.4.6.3.2

[24] Ruling handed down by Cologne Administrative Court 1 K 8432/04 of 15 September 2005, margin number 2.4.6.3.1

5.3.3 Consistency between regulated and unregulated wholesale products

Pursuant to Section 27 subsection 2 para 1 of the TKG, the Federal Network Agency "shall take care that rates regulation measures in their entirety are coordinated (consistency requirement)." This wording suggests that provision has not been made to include unregulated services.

However, one objection that can be raised against this narrow interpretation is that the term consistency in itself and the requirement that rates regulation measures must be proportionate to the regulatory aims is more likely to indicate the need for a broader focus. This assumption is supported in particular by an analogy from the price squeeze system that can logically be transferred to margin squeeze tests.

It was outlined in Chapter 4.1.3 that it is sufficient for the implementation of a price squeeze test if the wholesale product is subject to regulation. By contrast, for the retail rate it is not necessary to establish whether a company has SMP or there is a need for regulation. This ensues both from the wording and from the context. In addition, this stance also corresponds to competition law practice as reflected, inter alia, in the Decision of the European Commission of 2 July 2007 on the application of margin squeeze by Telefónica [25]

By analogy, it would seem appropriate that establishing a need for regulation in one of the relevant wholesale markets is sufficient grounds for conducting margin squeeze tests. With reference to this market it could then be examined whether the margins with other wholesale products of the SMP company are such that there will be no distortion of competition. For if a regulated rate fails to meet these requirements, it can be assumed that this rate – in combination with alternative wholesale services – has the potential to considerably obstruct competition or to discriminate against others for reasons that are objectively unjustified. This could also be characterised as abuse under Section 28 subsection 1 paras 2 and 3 of the TKG.

Just as a wholesale rate might be characterised as anti-competitive solely because the margin between it and the relevant retail rates may mean it is obstructing competition – even though it may not be classified as anti-competitive as a stand-alone rate –, it is

[25] Decision by the Commission of 2 July 2007 regarding proceedings involving pricing practices in violation of Article 82 of the EC Treaty (case COMP/38.784 – Wanadoo España/Telefónica), margin item 6.

necessary to be able to identify if there is an anti-competitive margin between unregulated wholesale rates and regulated wholesale rates. Otherwise, there is a risk that the effective regulation of essential access services provided for by the lawmakers could be counteracted and ultimately foiled by anti-competitive or discriminatory pricing by the regulated company providing alternative wholesale services – that are deemed at least partially replicable.

A wider understanding of the consistency requirement is also indicated in the explanatory memorandum on Section 25 subsection 2 of the draft Telecommunications Act, which explicitly states that "distortion of competition, for instance, by the occurrence of price squeeze, is to be avoided". As set out in the foregoing, it is irrelevant for price squeeze tests whether the rates for the relevant wholesale product(s) *and* for the relevant retail products are both subject to regulation. It depends only whether the wholesale market warrants regulation. The fact that this example is mentioned indicates there was no strict limitation to such constellations in which the sole determining factor is the margins between regulated rates.

Whereas it can be taken as a given that consistency and margin squeeze tests can be carried out regardless of whether all the wholesale services concerned are subject to regulation, the question remains what conclusions need to be drawn if margin squeeze is established without any company having SMP and without there being any need for regulation on one or more of the relevant wholesale markets. Relevant considerations will be discussed in the following Chapter 5.3.4.

5.3.4 Approaches to eliminate consistency problems identified

Whereas relatively few consistency problems are likely to arise in the margins between wholesale rates subject to ex-ante regulation (based on the criterion of the costs of efficient service provision) in the normal course of events when the above criteria are heeded, the question is how to eliminate any inconsistencies established between regulated and unregulated rates. Regardless of the considerations outlined in Chapter 5.3.3 on the need to carry out margin squeeze tests that include unregulated services too, there is no immediate regulatory access to them.

The problems associated with broadband access and call services can be taken as an

example to illustrate this. This is where the regulated wholesale products “access to the unbundled local loop”, “IP bitstream access” and “T-DSL-ZISP” are juxtaposed by unregulated wholesale products such as wholesale DSL (line resale), “ISP Gate” and “Online Connect” (the latter two being origination services). If the SMP company were to reduce the price of the Online Connect service and if the margin with the rate for T-DSL-ZISP determined on the basis of the costs of efficient service provision was reduced, this could potentially discriminate against ZISP customers and (considerably) prejudice their competitive opportunities.

If the Federal Network Agency was unable to create consistent margins between regulated and unregulated products in any such scenario on the basis of the rates subject to regulation, it would be equally unable to impose fair and non-discriminatory rates pursuant to Section 28 subsection 1 paras 2 and 3 of the TKG.

However, ensuring consistent margins between regulated and unregulated wholesale products when intervention possibilities only exist on one side gives rise to important questions, as the options available in the relevant regulatory procedures seem extremely unsatisfactory in economic terms, for

- the rate charged for the regulated wholesale service would either have to be fixed in derogation of the costs of efficient service provision, which would be unlawful on the one hand (especially if they were too high but also if they were below the costs of efficient service provision, according to the explanatory memorandum). [26] On the other hand, it would not be appropriate in economic terms either because sending the wrong price signals could lead to inefficiencies and misallocations particularly in terms of investment activity. If the rates fell below the threshold of the costs of efficient service provision this would hamper infrastructure-based competition and place service providers at a disadvantage who are unable to benefit from this wholesale product that does <u>not</u> cover the costs of efficient service provision;

- the approval of the rate would have to be denied pursuant to Section 35 subsection 3 of the TKG because the rates are inconsistent with the requirements of Section 28 of the TKG. This means a price of € 0 would apply until the SMP company offered to restore consistency “voluntarily”. However, this option must be

[26] In the legal basis on Section 29 of the draft Telecommunications Act it says: “By contrast, it is not permissible to fix prices with a cost-coverage shortfall by way of regulation against the will of the company having significant market power.”

seen in a critical light particularly in cases in which the SMP company has no interest in eliminating the inconsistency, for instance, because the resulting decrease in revenue could be offset by the opportunity to squeeze alternative infrastructure providers out of the market. In these scenarios, the question would ultimately arise whether eliminating the inconsistency would not “come at a price” of creating a new obstruction to competition.

Against this backdrop, it becomes clear that approving wholesale rates below the costs of efficient service provision or denying approval can lead to enormous distortion of competition, meaning that any such approach would rarely be considered. It hence ensues that, in order to safeguard consistent rates regulation in these cases, it may be necessary to conduct the three-criteria test in order to establish the need for regulation of the market hitherto exempted from regulation. Another option would be for the Federal Network Agency to impose an order to surrender economic gain (Section 43 subsection 1 of the TKG) or to make the approval of rates subject to certain conditions. The latter would mean that the approval of regulated rates would be subject to a condition, for instance, a certain margin having to be maintained between the rate charged for an alternative wholesale product, if the outcome otherwise was likely to be a considerable obstruction of competition (at least also) regarding the regulated market or – in the case of equal or similar telecommunications services – discrimination. As any such distortion of competition (and/or discriminatory practice) could greatly reduce the effectiveness of regulatory measures on the SMP market or enable the SMP company to avoid the regulation of wholesale products, it is, in principle, considered an efficient strategy to make approval contingent on certain conditions in order to safeguard a consistent rates regulation regime. Otherwise, the necessary consistency would have to be secured on the basis of competition law.

5.3.5 Consistent timeframes for alternative wholesale products

Coordinated timeframes for rates regulation measures indicates the need for coordinated timeframes in the wider context. For example, coordinating the periods of validity for rates approved under ex-ante regulation could be considered; the Agency can influence these by determinations in the approval. This should also apply analagously to coordinating pricing decisions in ex-post regulation.

However, there is the problem that, in both ex-ante and ex-post procedures, the rates for a large number of wholesale services (and retail services) could be eligible, given the variety of business models on the different markets. It is hard to predict how many applications will be submitted and what facts may come to light offering grounds to suspect abuse. The legal aspect must not be forgotten that the Agency is bound by certain deadlines after applications have been submitted and official proceedings instituted, some of which – particularly with ex-post regulation – are very short (for instance “within two weeks of receipt”). This means it is only possible to coordinate the timeframes if it is possible to do so in the first place on the basis of the regulated company's applications and the pre-determined decision-making periods. It should also be noted that coordination along the lines of synchronising the approval of all central wholesale services would not be possible owing to the limited capacities available to the regulator, thus not least for practicality considerations. What is more, the requirement of submitting cost documents in parallel in the various proceedings would also cause considerable difficulties for the companies concerned.

Another problem facing consistent timeframes is the incongruence between the periods for setting rates and the economic and technical life of the telecommunications infrastructure. To date, rates have typically been fixed for a period of approximately two years, although the economic life of the infrastructure in which investment has been made is estimated to be much longer and so several such decisions will be necessary. The assessment of the infrastructure tends to be based not on investments at a specific time but rather on a large number of different types of investment made at different times. Depending on the time the investments are made, the conditions under which they are financed tend to vary. It would seem impractical to have to trace the actual historical investment and financing processes. In ex-ante regulation the Agency relates the term "costs of efficient service provision" to the time the regulatory decision is taken, using the replacement prices, conditions on the capital market and technologies deployed for service provision at this time as a basis, in a future-oriented way.

Last but not least, the Agency also takes the time factor into account by matching the approval periods to the particular market, legal and technological environment. This means, for instance, that in areas experiencing relatively few changes there will be a tendency towards longer approval periods, whereas in areas experiencing major changes or in which there is a greater need for coordination with alternative wholesale products, the approval periods tend to be shorter. Nonetheless, changes in approval periods must

not confront the market players, who basically have a vested interest in the predictability of regulatory conditions, with unreasonable planning uncertainty. Regulatory predictability can be increased and even secured if relevant “guidelines”, “key elements” and administrative rules are published.

For other aspects, reference is made to Chapter 4.2 for the consistency of decisions over time.

6. Consistent rates regulation in an environment of technological change

As outlined in Chapter 2.1, the consistency requirement is oriented to “rates regulation measures in their entirety being coordinated”, and to investment decisions and the choice of business models associated with these decisions being subject to economic rationality. This becomes a challenge particularly when technological changes occur, facilitating new, and perhaps more, business models, and companies which have invested different amounts in their own infrastructure end up competing with each other. The migration from traditional circuit-switched networks to packet-switched networks on the basis of the IP Protocol means that a process of significant technological change is taking place involving both access networks (Next Generation Access Networks, NGA) and core networks (Next Generation Networks, NGN). The issues arising from technological change can therefore be classified as a special manifestation of consistent timeframes (cf. Chapter 2.1.3).

As the process of technological change is still underway, it remains to be seen which business models will ultimately be successful on the market. This means that safeguarding consistency in an environment characterised by technological change represents a special challenge. Rates regulation measures should be forward-looking in the sense that they should facilitate business models that do not exist today but that may be potentially efficient in the future, without creating barriers to market entry owing to regulation.

New business models requiring different wholesale products than those available today may emerge owing to changes in network architecture on the one hand. However, it is also possible that business models available today may become obsolete. This may refer

to the model of the unbundled local loop (at the main distribution frame) when fibre infrastructures are installed closer to the customer's premises as part of NGA migration, meaning that access to the unbundled local loop (at the main distribution frame) will no longer be possible in these regions. In the area of core networks, it is above all a matter of establishing how a viable interconnection system for future IP-based networks should be structured and how migration to this system can be designed. All things considered, it is anticipated that meeting the consistency requirement in an environment of technological change will become an ever more complex task, because it will undoubtedly become more multi-dimensional (cf. also *Key elements on the regulatory framework for the development of modern telecommunications networks and the creation of high speed broadband infrastructures).*

6.1 Next Generation Access Networks (NGA)

6.1.1 Changes in business models and wholesale products and their implications

Migration to Next Generation Access (NGA) is aimed particularly at delivering sustained bandwidths significantly in excess of those that can be achieved with the access technologies available today. In order to facilitate this, the trend is to use a fibre optic connection as close to the customer's premises as possible, offering the highest bandwidth. Deutsche Telekom has, for instance installed a VDSL network in 51 cities. Some competitors are actually going one step further and are deploying fibre to the building (FTTB) in urban conurbations such as Cologne and Munich. Some public utilities are also installing fibre access networks in rural areas.

The technological changes that go hand in hand with migration to NGA imply that new business models will emerge and old ones may become obsolete. With NGA migration, the number of wholesale products offering different access points along the value chain will increase. This applies, for instance, to unbundled access to the local loop. In addition to access at the main distribution frame, access to the local loop at the cabinet is already available today. If fibre is to be installed even closer to the customer's premises in future, there may be variants of local loop access available also for the variants Fibre to the Building (FTTB) and Fibre to the Home (FTTH).[27] As ancillary wholesale services for

[27] cf. ERG Opinion on Regulatory Principles of NGA (ERG (07) 16rev2).

FTTB and FTTH, duct access and access to in-house wiring may also be necessary.

The local loop variants differ in their length, location of the access point along the value chain and the use of copper or fibre. Depending on the length of the local loop, the size of the concentrator network and its expansion in the direction of the end customer may change too. This means that a shorter local loop implies a correspondingly larger concentrator network that goes closer to the customer's premises.

Changes may also occur in respect of bitstream access. In the NGA context, in addition to the existing bitstream product offering 73 access points, a bitstream product with access at the first aggregation level may also be relevant, possibly at the location of today's main distribution frames. This applies when, in the course of further roll-out towards the end customer, the active technology is transferred to the street cabinet, meaning competitors would no longer be able to unbundle the local loop at the MDF, compelling them to change their business models. If deploying own infrastructure closer to the end customer's premises does not represent an economically viable option owing to diseconomies of scale, such a bitstream access product could gain momentum at the first aggregation level.[28]

It is anticipated that future network topologies will be much more heterogeneous than today's network topologies. This means that the deployment depth of own infrastructure may differ from region to region (e.g. conurbations/rural areas) in respect of all market players, also depending on the economies of scale in these regions. It also means that a technology mix may be used. Accordingly, different wholesale products may also be used in different regions.[29]

6.1.2 Consistent rates in the context of NGAs

Growing complexity in achieving consistency in the NGA context

[28] In the image of the concept of the investment ladder, bit stream access represents a lower level than the unbundled local loop. In order to maintain the benefits of infrastructure competition based on LLU, the design of the WBA product might need to be enhanced to allow - on a non-discriminatory basis - alternative operators maximum control of quality parameters (e.g. multicasting) possible in order to compete on a level playing field with the retail arm of the SMP operator.

[29] In the image of the concept of the investment ladder this means that different levels of the ladder may exist in parallel.

If the transition to NGA leads to greater heterogeneity if only because of the different economic conditions in the different regions (economies of scale), it will also become more complex to create a consistent rates regime because more different wholesale products will have to be taken into account and, possibly, their charges coordinated. Wholesale products vary both in relation to their position along the value chain and also in substantive terms (cf. Chapters 5.1, 5.2). The consistency requirement applies to the relation between various types of local loop and bitstream access, to the relation between local loop and bitstream access products and ultimately to the relation between potential ancillary wholesale products. The latter applies, for instance, to the ancillary wholesale products duct access and services designed for Internet service providers (from the street cabinet to the alternative operator's infrastructure) that allow competitors to bridge the route to the street cabinet if they are using an FTTCab business model. It also represents a major challenge to achieve consistency between wholesale and retail products, which is aimed in particular at avoiding price squeeze (cf. Chapter 4.3). In addition to these aspects of consistent content, it will also become increasingly difficult to achieve consistency over time, the more heterogeneity there is (cf. Chapters 4.2 and 5.3.4). This applies all the more so as it is not yet known when future access infrastructures will be fully deployed.

Against this backdrop, it becomes evident that, for reasons of practicality, it is far more important to achieve optimum consistency than maximum consistency (cf. Chapter 2.2.2).

Consistency of standards and methods

Consistency problems are always bound to arise when different wholesale services are regulated on a different cost basis (cf. Chapter 3.3). Different standards and different methods of analysis are being discussed in relation to regulation of NGA wholesale products (including rates regulation based on cost documentation, benchmarking studies and analytical cost models).

It is likely to be much more difficult than hitherto to apply the comparable market concept to the NGA context in practical terms because there will probably be an increase in the number of wholesale products and access points available. There are also fundamental differences between the strategy chosen in the various countries, the migration pace as well as differences in relation to historical/technical circumstances (e.g. length of the

access line, ratio between the number of main distribution frames and street cabinets). Another reason is the fact that migration is still at a relatively early stage in many countries, which would render it difficult to draw a comparison.

The approach of using historical costs contrasts with the pricing mechanism in competitive markets in which the prices reflect the current costs and hence the decision-making situation of new market entrants. This logic of competitive markets is reflected in the concept of the costs of efficient service provision pursuant to Section 31 of the TKG according to which these long run incremental costs of service provision are determined on the basis of replacement values.

6.1.3 Transitional problems of migration to NGA

In the course of migration to NGA, the question arises whether and, if so, what new wholesale products will become relevant and to what extent other wholesale products may be discontinued. The question regarding timing of the transition arises too. As such, it is in particular a matter of deciding for what length of time current and future access networks/retail services should be allowed to exist in parallel in order to facilitate migration for all market players, enabling them to provide services to existing customers without interruption, as far as possible. If it transpires that *more* wholesale services will exist in parallel during this time (i.e. current and NGA-based wholesale services), it is likely that it will become more difficult to achieve a consistent rates system.

In principle, the question arises to what extent current services provided on the basis of regulated wholesale services can continue being provided in the NGA context and how long the SMP company should be obliged to continue providing these wholesale services. In order to ensure that competitors are able to compete with the SMP company in the NGA context as well, the task of providing access to the local loop at the main distribution frame should only be possible where adequate wholesale alternatives are available and can actually be utilised. In general, it must be borne in mind that the transitional arrangements must be such as to enable competitors to manage in administrative and organisational terms too.

With the above-mentioned question regarding the transitional arrangement for NGA, it must also be taken into account that NGA migration cannot be achieved simultaneously

on a nationwide basis (see above). Rather, it will take place over time (beginning in conurbations), creating an access infrastructure that will vary from region to region owing to different economies of scale and economies of density.

Another aspect the Federal Network Agency will need to take into account is the fact that any indication of a transition from the old access networks to NGA does not have any undesired effects in relation to local loop-based competition. Regulated companies have the right to remodel their infrastructure on the one hand, but they must ensure on the other that this does not render it unattractive for competitors to make further investment in the local loop if it becomes apparent that NGA migration is likely to take much longer than originally indicated. In order to rule out any such effects – comparable to an investment moratorium – the regulator could set adequate transitional periods, impose reasonable conditions on infrastructure modernisation announced and adequate transparency obligations in relation to this architectural evolution.

6.2 Next Generation Networks (NGN)

6.2.1 Elements of an interconnection system

Migration towards IP-based networks is also taking place in the area of core networks, focusing above all on interconnection aspects. Consistency issues arise regarding the core elements of an interconnection regime[30] used to describe the interconnection modalities of telecommunications networks: 1) the number and geographical location of interconnection points, their hierarchy and functional importance; 2) specification of the quality requirements for traffic handover; 3) pricing principles – referring, for instance, to the billing units or the staggering of rates based on interconnection levels; 4) an accounting system. With the accounting system, it is a matter of deciding “who” needs to pay for what parts of the value chain. In principle, the term “accounting system” can refer to both the wholesale and the retail level. In the context of this document, the main focus will be placed on the wholesale level.

At present, there are different interconnection regimes in place for traditional telephone networks on the one hand and for “the Internet” on the other. Given the migration

[30] cf. Final report by the project group “Framework Conditions for the Interconnection of IP-based Networks” (2006).

processes that are currently underway, the question immediately arises what constitutes a suitable and forward-looking interconnection regime. Owing to the fact that – put in simple terms – interconnection in the "old" circuit-switched world is regulated whereas in the packet-switched world it is unregulated, the relationship between regulated and unregulated services and their mutual consistency is coming into focus. Amid the co-existence of different regimes, the question how the migration process can be organised so that it becomes a target regime is gaining momentum.

The following information is not aimed at refuelling a discussion about a suitable, future interconnection system. In this regard, reference is made to the discussion process on the "Framework Conditions for the Interconnection of IP-based Networks" and on the interconnection key elements. Rather, it is a matter of indicating at what point consistency issues are likely to arise in the NGN context.

Today's interconnection systems

Number and geographic location of interconnection points, their hierarchy and functional importance

Today's PSTN network comprises 3 physical layers. For the purposes of regulating interconnection charges, however, a network comprising 2 physical layers is used within the framework of Element Based Charging (EBC) for efficiency-related reasons. There are currently three different charges available: local, single transit and double transit. However, nationwide coverage at the lowest rates requires interconnection at 474 local exchanges.

Specifying the quality requirements for traffic handover

The transport service of traditional circuit-switched networks is determined by the transmission plan.[31] If network carriers adhere to this transmission plan, end customers can in all likelihood expect to benefit from high voice quality. However, this is by no means guaranteed as voice quality has not been explicitly specified.

[31] cf. ITU-T Recommendation G.101

Pricing principles

In circuit-switched networks, wholesale service rates are levied on the basis of network elements used, with minutes as the billing basis. In packet-switched networks, the bandwidth used during peak times is the actual cost driver, although the data volume is frequently used as a parameter for determining the rates.

Accounting system

PSTN and IP-based networks are nowadays subject to different accounting systems. In PSTN, the system "Calling Party's Network Pays" (CPNP) applies at the wholesale level, with the network carrier of the caller paying a termination rate to the network carrier initiating the termination. This is based on the consideration that where the caller initiates a connection, the caller's network is deemed the initiator at wholesale service level. As such, the focus is placed on voice services. One problem associated directly with CPNP is the termination monopoly, as it offers the terminating subscriber network carrier incentives to exploit the physical termination bottleneck by levying excessively high termination charges. In order to prevent the termination monopoly from being exploited, termination services are subject to regulation. In addition to the physical termination bottleneck and the accounting regime, the termination monopoly also depends on the control over the E-164 as it is only the network carrier of the called party who can put through the call.[32]

Interconnection in IP-based networks is not yet subject to regulation – either in the form of peering or as transit. When charges are levied for transit services, they flow exclusively in the upstream direction. Even though it is only the Internet service provider of subscriber B who can provide the physical termination service in this case – contrary to the PSTN world – it does not receive any payment for termination at the upstream level. In the USA, Bill & Keep is used in the field of mobile communications and generally also for fixed-network connections between competitive local exchange carriers. The Internet service provider covers its net costs of termination (as well as any interconnectivity costs) via the retail level. The scope of application of Bill & Keep hence refers to the termination segment. The minimum scope of application of Bill & Keep can be defined as follows: "Bill & Keep might be applied for the terminating segment up to the

[32] For a more detailed description of the existing interconnection regimes and the differences between them, please refer to ERG Common Statement on Regulatory Principles of IP-IC/NGN Core – A work programme towards a Common Position (ERG (08) 26rev1), Chapter B.2.

first router or switch and associated control functions after the access/concentration network. Transit services are not included in the Bill & Keep model ...".[33] Unlike the CPNP model, Bill & Keep does not allow for the physical termination bottleneck to be exploited if competition at retail level is sufficiently intensive between the network carriers and in the transit area between the IP backbone operators. This gives network carriers an incentive to enhance efficiency.

Future interconnection systems

Number and geographic location of interconnection points, their hierarchy and functional importance

As far as the number of interconnection points is concerned, the general expectation is that they will probably see a reduction compared to circuit-switched networks. The Final Report by the Project Group puts 100 locations as a realistic upper limit for the number of locations for IP interconnection in the core network. A reduction in the number of interconnection points compared to PSTN can lead to "stranded investments" among market participants. In this regard, it represents a key challenge for Deutsche Telekom AG to implement its infrastructure modernisation on the one hand, while enabling competitors to invest in the infrastructure on the other.

Specifying quality requirements for traffic handover

IP-based networks are usually based on the best-effort principle. However, this does not automatically mean they offer poorer transmission quality or quality of service. The factors influencing the end-to-end quality of a service include not just the transmission quality at the transport level but also the conditions in the access and core network as well as the terminal equipment and the codecs used.[34] Nonetheless, it is conceivable that a best-effort quality may not be sufficient for certain services such as videoconferencing and that the quality guarantees for transmission to IP-based network on the basis of relevant transport classes may move into the foreground.[35] The quality aspired to would have to be ensured across the entire chain of networks involved in providing the service.

[33] ERG (08) 26rev1, p. 23.

[34] cf. " Key Elements for the Interconnection of IP-Based Networks ", Key element 2. These key elements were drawn up on the basis of the Final Report and on the comments submitted within the framework of the subsequent consultation process.

[35] cf. ERG (08) 26rev1 (Chapter B.3.5.1).

Up to now, however, quality of service (QoS) is not delivered across all networks.[36] QoS therefore potentially represents an *additional* dimension to the interconnection of IP-based networks and hence also in terms of safeguarding consistency. QoS may create new challenges in safeguarding non-discriminatory practices, for instance, if QoS creates incentives to lower best-effort transport quality.[37]

Pricing principles

It can be assumed that accounting at the wholesale level in IP-based networks is more likely to be based on the data volume or bandwidth used than on minutes, as this reflects the cost drivers of these networks more effectively. In principle, this already applies to packet-switched networks today. There are a number of options that can be considered, for instance, reserving a certain capacity volume or accounting based on actual volume. It is assumed in this case that the accounting system will require pricing.

Accounting system

Given that PSTN and IP-based networks exist in parallel today and that both types of network are based on different interconnection systems, the question automatically arises which interconnection system will be suitable for the future with migration to IP networks. It was the subject matter of the "Framework Conditions for the Interconnection of IP-based Networks" project group set up by the Federal Network Agency in August 2005 to develop a sustainable interconnection regime and the migration steps towards it.[38] No conclusive decision was reached in relation to the accounting system owing to the different views held by the experts. In its "Key Elements for the Interconnection of IP-Based Networks", the Agency deems it both conceivable and reasonable if *Bill & Keep* mechanisms gain acceptance in the long term, at least on the transport layer.

Separation of transport and service

Another relevant aspect of a future-oriented interconnection regime is the potential separation of transport and service.[39] In its "Key Elements for the Interconnection of IP-Based Networks", the Federal Network Agency established that a future-oriented

[36] cf. ERG (08) 26rev1 (Chapter B.3.5.3).
[37] cf. ERG (08) 26rev1, Chapter. C.3 and C.4.
[38] The project group submitted its Final Report on 15 December 2006.
[39] cf. both the NGN specifications on NGN (ITU-T) and on NGI (IETF).

interconnection regime for IP-based networks should reflect the separation of transport and service.[40] As far as consistency is concerned, it must be taken into account that transport and service interconnection take place at different network nodes and on different levels of the hierarchy.[41]

6.2.2 Causes and examples of challenges relating to consistent timeframes

Technological change presents one of the main challenges to consistent timeframes. Consistency problems can arise in particular if different networks (PSTN/IP-based) using different interconnection systems and, in particular, different accounting systems co-exist. This is already the case today as both networks are used to transport voice services owing to the growing importance of VoIP. From this it follows that the original functional allocation of network and service (transport of voice via circuit-switched networks and data via packet-switched networks) is increasingly called into question. However, the problem with consistency does not actually arise until a VoIP user calls a PSTN user (or vice versa), as in this case both types of network and hence both interconnection systems are involved. The collision of different accounting systems hence creates a consistency problem in terms of the methods used.

Before the above-mentioned project group was set up, the contention raised by market participants from the “PSTN world” was that companies providing VoIP services were merely engaging in arbitrage practices, as they receive a PSTN termination rate even though the termination service is provided over the Internet, offering merely best-effort quality. This debate was also carried on in the Final Report insofar as a group of market participants made a distinction between Voice over NGN (VoNGN) and Voice over Internet (VoI).

In their view, with Voice over NGN, a “perceptible” voice quality similar to PSTN telephony is ensured via managed networks, which explains why both termination services should reflect the same level of prices. Comparable quality parameters could not be achieved on the basis of Voice over Internet, which is why the termination rates should be accordingly lower. In its “Key Elements for the Interconnection of IP-Based Networks”, the Federal Network Agency concluded that, at present, there are no

[40] cf. Key element on the interconnection of IP-based networks, Key element 1.
[41] cf. ERG (08) 26rev1, Chapter B.3.3.1.

adequately reliable separation criteria for the provision of the voice retail customer service on the basis of guaranteed quality for a differentiation between corresponding interconnection products for Voice over NGN or Voice over Internet.[42]

When a comparison is drawn between the present and future interconnection systems, it becomes clear that interconnection issues are bound to become more comprehensive in future, as the potential separation of transport and service and the QoS aspect will add further dimensions. This will also render it more difficult to safeguard consistent rates. This relates to the issue of consistency *within* the future interconnection system on the one hand as well as the transitional phase on the other.

Yet there are some aspects that have a tendency to reduce consistency problems. Even today, the majority of all interconnection services are not subject to regulation, as the unregulated mechanisms of IP networks apply. A switch to Bill & Keep could reduce consistency problems as this system avoids termination monopolies, thereby reducing the need for regulation.

Secondly, the provision of a service-independent interconnection product could simplify the situation (see above). In the “Key Elements for the Interconnection of IP-Based Networks”, the Federal Network Agency did not consider the introduction of service-specific interconnection structures in packet-switched networks on the transport layer to be useful.[43] It also held that a service-independent system would reflect the multi-service character of future networks more effectively.

Nonetheless, significant changes have taken place in the past in the system of interconnection charges. One such “leap” was the transition from the distance-based interconnection system to EBC. The challenges faced today result from the technological changes to the underlying network, which give rise to content-related and methodical issues in relation to *all* elements of an interconnection system.

[42] cf. Key Elements for the Interconnection of IP-Based Networks, key element 3.
[43] cf. Key Elements for the Interconnection of IP-Based Networks, key element 2.

6.2.3 Migration-related aspects

IP as an efficient technology

Since the costs incurred in packet-switched networks are expected to be lower than in circuit-switched networks, there is much to be said for taking these low costs as a basis for the pricing of the interconnection of packed-switched networks, particularly since it must be assumed that the migration process towards packet-switched networks has already started. It must also be taken into account in this context that, in principle, the concept of the costs of efficient service provision does not differentiate price according to technology used or account for the existence of different prices being charged for the same service. Basing prices on efficient technology also provides incentives for speeding up migration to this technology. In addition, the fact that the boundaries may shift between access and call networks in the course of migration must also be taken into account (cf. also Chapter 6.1.1).

Against this backdrop, two major issues arise: from *what point in time* should the – basically more efficient – IP technology form the basis of regulatory decisions? And *how long* should a PSTN network that is clearly being phased out be calculated on the basis of replacement? In the Agency's current estimation, it is still reasonable to base the determination of the costs of efficient service provision on the existing PSTN at the cost of replacement.[44]

Glide path

Once the question has been answered from *what point in time* the – basically more efficient – IP technology should form the basis for regulatory decisions on interconnection charges (see above), it needs to be considered whether in view of the (potential) dimension of cost change due to packet-switched technology, switching interconnection charges to this lower level immediately is too disruptive to the market and in particular for the providers of PSTN interconnection services.[45] In principle, establishing a glide path

[44] Ruling Chamber 3c-08-137 (highlighted version), Section 4.1.3.1. This is explained by the fact that for the approval period, NGN migration "will not yet take significant effect" and "there is no way costs can be determined for an NGN-based network at this point in time" owing "to a lack of availability of entry data and unclear future interconnection structure".

[45] cf. Final Report, Chapter A.1.7. as well as Key Elements for the Interconnection of IP-Based Networks, (key element 5). This type of sliding path was considered both in the Final Report and in the Key Elements for the Interconnection of IP-Based Networks published by the Federal Network Agency.

would be another option. This would not conflict with the fact that the concept of the costs of efficient service provision basically does not make any price distinction according to what technology is used and is not familiar with different prices existing in parallel. A glide path presumes the determination of the new level of costs and hence prices for interconnection services and the glide path leading to them. The new price level for interconnection services based upon NGN costs should be reached when the transition to NGN has been completed.

Uniform price level

In consideration of the fact, however, that different pricing systems for different networks involve arbitrage and bypass possibilities, a uniform pricing system for the PSTN and NGN interconnection should be considered. The principle of uniform prices for the PSTN and IP interconnection must also be defined in terms of structure. This represents a complex challenge that needs to be discussed in detail; firstly because hierarchical levels may be reduced and secondly because the functional levels of PSTN and NGN are not necessarily equivalent.[46] The nationwide use of the "local" tariff requires interconnection at 474 local exchanges and therefore requires a company to make far heavier investment than if it had to develop just 100 IP core network locations. This difference in network architecture hampers price consistency within the meaning of a uniform price level as there is a significant difference between the scope of services available.

This means it may not be possible either to use the hierarchical three-level concept of the PSTN that makes a distinction into "local, regional, national" for IP networks. However, migration to one IP network that has two physical layers does not automatically mean that the services "single transit" and "double transit" will be abolished. The top network layer of an NGN could comprise single and double tandem termination if more than one location existed at this layer and if each individual location covered a specific region.[47] It is also doubtful whether there is any equivalent to the concept of *local* interconnection in IP-based networks. Services can be provided nomadically and independently of location in IP networks. Distance is also less of a cost driver in IP networks than it is in PSTN. In order to be able to provide efficient IP migration incentives despite all these differences, it is conceivable that the lowest tariff level for IP interconnection might be applied to the maximum number of interconnection points offered for national network coverage.

[46] cf. Final Report (Chapter A.1.7) and ERG (08) 26rev1 (Chapter B.3.3.2).
[47] S. ERG (08) 26rev1 (Chapter B.3.3.2).

7. Conclusions

With the consistency requirement enshrined in Section 27 subsection 2 of the TKG, the objective is to coordinate rates regulation measures in their entirety in terms of content and timeframes. The margins between wholesale charges along the value chain must be arranged in such a way that the service providers are able to operate efficiently on the various levels of the value chain with their chosen business model. The ultimate aim of this requirement is to ensure there is no distortion of competition and that efficient investment in infrastructure is promoted. Yet in recent times, the questions arising and their complexity have increased as a result of technological change and the growing number of competing business models.

In past years, both Deutsche Telekom AG and its competitors have invested heavily in the infrastructure. Notwithstanding this, even an efficient alternative infrastructure manager will typically be unable to benefit from economies of scale and economies of density to the same extent as the former monopoly company.

To reflect this, an adequate extent of economies of scale that efficient network operators can realistically achieve must be taken into account when consistent rates are set. In this regard, it will need to be assessed repeatedly over time,

- how the costs of the relevant infrastructure elements and service components are changing amid this technological development,

- what economies of scale should be taken as a basis for efficient network operators, taking market penetration and the average market share of efficient competitors into account, and

- how network expansion and the development of further access areas are expected to develop against this backdrop.

All of the above highlights the fact that this involves a dynamic approach, as examining the consistency of rates is also dependent on the stage market development has reached. This is intended not only to ensure that there is a sufficient margin with retail prices charged by the SMP company but also that different wholesale rates are coordinated in such a way as to ensure that incentives for efficient investment are

created and maintained.

The deployment of a company's own infrastructure can give the company a competitive edge if it enables it, for instance, to generate more of its own value added, to distinguish itself from its competitors by offering services in different levels of quality, and thus to achieve greater independence. Nonetheless, uncertainties regarding depreciation may need to be taken into account not least against the backdrop of technological change and in view of the fact that a substantial proportion of investment in telecommunications networks can be characterised as "sunk investments". As such, the question basically arises how these types of risk should be handled. In addition to the possibility of reducing uncertainties by imposing regulatory requirements, for instance, it may also become necessary to reflect these uncertainties when mapping the calculations for the activities of an efficient competitor.

Hence an area of tension may arise with consistent rates regulation for different wholesale services, tension that can be highlighted using the relationship between access to the unbundled local loop and IP bitstream access as an example. In this, it is important to strike the right balance between the margins in order to ensure efficient incentives for investment.

Yet the principle applies that margin squeeze can be prevented in particular by ensuring that a business model based on further investment in infrastructure must not be burdened by higher costs than the business model used by a competitor requiring lower investment.

In this context, it cannot be ruled out with regard to avoiding price squeeze and margin squeeze that situations may arise in which the trade-off between static efficiency and dynamic efficiency is called into question. It would ultimately be unavoidable in cases of doubt to analyse the trade-off between aspects of static efficiency and dynamic efficiency. This means that a loss of welfare in terms of static efficiency would be justified if there was a strong probability that this would be overcompensated for in terms of dynamic efficiency in the long term considering the relevant macroeconomic benefits this would generate.

These considerations indicate that – particularly in a phase of technological change and the accompanying further development of the telecommunications networks – rates

regulation decisions will have to be taken that weigh one aspect against another, if the regulatory aims are to be met as effectively as possible.

To secure sustainable competition, it is essential to have a range of wholesale services available that reflect demand, with the rates for essential access services being subject to ex-ante regulation and determined on the basis of the costs of efficient service provision. Rates that correspond to the costs of efficient service provision mimic the prices that can be achieved in a competitive environment and create efficient incentives for investment, as proven by developments over the past eleven years. At the same time, the company subject to regulation will be allowed to generate reasonable rates of return and to offset costs incurred by special burdens. This ensures the incumbent has sufficient funds to expand and modernise its networks. Yet the criterion of the costs of efficient service provision has proven to be sufficiently flexible to map all the relevant risks involved with the return on capital and to facilitate new tariff structures.

Against the backdrop of the trend towards packet-switched networks, it represents a real challenge to safeguard consistency simply because this task will inevitably become more complex and multidimensional. Rates regulation measures should therefore be sustainable in the sense that they facilitate business models that do not yet exist but could potentially be efficient in the future, thereby ensuring regulation does not act as a barrier to market entry.

In the area of access networks, migration to NGA can increase the number of wholesale products, with different access points along the value chain. This applies to access to the unbundled local loop in particular. It can be assumed that future network topologies will become more heterogeneous, as the economic circumstances may vary in different regions. This will make it even more difficult to implement a consistent rates regime. If different criteria and rate determination measures apply to different wholesale services, this too can make it difficult to achieve consistency. For the migration phase to NGA, issues arise particularly regarding the scheduling of the transition, for instance, how long the SMP company will have to continue providing current wholesale services in the NGA context.

It should be pointed out with regard to core networks that even today, the vast majority of interconnection services are not subject to regulation. Against this backdrop, the relationship between regulated interconnection services (in the circuit-switched world)

and regulated interconnection services (in the packet-switched world) is becoming a focal point. If parallel networks exist (PSTN and IP networks), to which different interconnection and accounting systems apply, this can lead to consistency problems in terms of the methods used.

Insofar as further dimensions become relevant in future networks with the potential separation of transport and service and the aspect of quality of service, issues relating to a consistent interconnection regime will be more complex than they are today.

Migration to IP-based networks also raises the question from what point in time this – basically more efficient – IP technology will provide the basis for regulatory decisions. A glide path could, in principle, be considered for the practical organisation of the migration path to avoid a disruptive transition of the interconnection charges to the level of the costs of packet-switched networks, although the deceleration should not last too long as otherwise the objective of safeguarding consumer interest could be put at risk.

In the final analysis, the considerations outlined in this paper demonstrate that safeguarding consistent rates regulation represents an ever more complex challenge. This applies all the more so given that the margins between the different rates have a major impact on safeguarding fair competition and providing adequate and efficient incentives for investment. So from this point of view, the Federal Network Agency perceives it to be a key task to meet the various statutory requirements in parallel, by creating sustainable competition to ensure the decisions it takes – in the interest of (private and commercial) users – help to promote efficient investment in efficient infrastructures.

It is of paramount importance to have consistent rates regulation not least in view of merging new technologies that will in turn facilitate new business models. Regulatory practice should be able to respond flexibly to this in order to have a positive influence on developments.