10 years of liberalised telecom markets in Germany: Assessing the degree of competition on the markets for voice telephony

By

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Preliminary draft

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18th EUROPEAN REGIONAL ITS CONFERENCE OF THE INTERNATIONAL TELECOMMUNICATIONS SOCIETY

September 2–4, 2007 Istanbul, Turkey

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Abstract

Market data for the German telecom market shows that Deutsche Telekom as the former incumbent is constantly loosing shares on all markets for voice telephony: the market for local calls, the market for long-distance calls and the market for international calls. At the same time prices decline steadily with the latest trend being that operators offer voice services free of charge, the costs of which are covered by a monthly subscription charge. Against this background the paper examines the state of policy and regulatory reform in the telecommunications sector in Germany almost 10 years after the liberalisation of the fixed telecommunications market. Thereby the focus is on the analysis of the competitive conditions that have been established on the German market for voice telephony services. If these retail markets are competitive, there might be a need to remove remaining regulatory provisions. In the new environment of converging markets the future challenge of regulating fixed telecom markets might be to ensure that access to the network and/or services of a potentially dominant provider in a relevant market will satisfy requirements for openness and non-discrimination.

The paper is organised as follows. The first section specifies criteria and corresponding indicators for analysing the competitiveness of the markets for voice telephony: market shares, market entry barriers and prices. The second section provides a brief description of the development of the German regulatory framework for telecommunication services, starting in 1998. Thereby, the focus is on tariff issues as an important element for creating competition on voice service markets. The third section analyses the degree of competition realised on voice service markets in Germany after roughly 10 year of liberalisation. How has competition evolved, who are the entrants and how have prices developed in different market segments? The fourth section draws some conclusions as to the current regulatory regime and it's appropriateness for encouraging competition on future telecom markets.

KEYWORD

price competition, regulation, liberalisation, tariffs, network access, voice telephony

1 Introduction

On 1st January 1998, the German market for voice telephony was fully liberalised. Genuine competition between market participants has been one main goal of the liberalisation of the German Telecom markets. Under a comprehensive legal and regulatory framework that provides for safeguards against unfair competition and market power, Deutsche Telekom (DT) as the former incumbent was obliged to supply a broad portfolio of access services and network capabilities from day 1 of telephone competition: Interconnection, call by call capability of all customer lines in Germany, number portability, equal access, and nationwide unbundled access to the local loop (ULL) have all been available since January 1, 1998. New operators have been free in entering any segment of the market for fixed telephony services. Deutsche Telekom had to provide network services under equitable and non-discriminatory terms and conditions at cost-oriented rates on an unbundled basis, including direct access to the line side of exchanges, and co-location of interconnect equipment if requested.

Today, nearly 10 years later, market data for the German voice telephony market shows that Deutsche Telekom as the former incumbent has been constantly loosing shares on all markets for voice telephony: the market for local calls, the market for long-distance calls and the market for international calls. At the same time prices have declined steadily with the latest trend being that operators offer voice services free of charge, the costs of which are covered by a monthly subscription charge. Against this background the paper analyses the degree of competition that has been established on the German market for voice telephony services. If these retail markets are competitive, there might be a need to remove remaining regulatory provisions. The future challenge of regulating fixed telecom markets is to avoid overregulation that could disturb market development. A light-handed regulatory regime may ensure that access to the network and/or services of a potentially dominant provider in a relevant market will satisfy requirements for openness and non-discrimination.

The paper is organised as follows. The first section specifies criteria and corresponding indicators for analysing the competitiveness of the markets for voice telephony. The second section provides a brief description of the development of the German regulatory framework for telecommunication services, starting in 1998. The third section analyses the degree of competition realised on voice service markets in Germany after roughly 10 years of liberalisation. The fourth section draws some conclusions as to the current regulatory regime and it's appropriateness for encouraging competition on future telecom markets.

2 Indicator to determine the degree of competition

There are numerous criteria which determine the competitiveness of markets in general and telecommunications markets in particular. In order to effectively perform a competition analysis of a relevant telecommunications market one needs to select the most relevant criteria. Depending on the market under consideration different criteria may be applied. For the purpose of operationalising these criteria, indicators for measuring the competitiveness must be specified. Once the indicators have been determined, the degree competition can be examined. The following section specifies the criteria for assessing the competitiveness of the German voice telephony market and elaborates a set of indicators for each criterion that can be used in a competition analysis. The degree of competition in the German market for voice telephony will be measured by analysing the following three key criteria: "Levels of market concentration", "Height of barriers to entry" and "Competition in prices".[1]

2.1 Level of market concentration

The level of market concentration can be measured in terms of market shares and the number of providers. It is the most relevant criterion for the degree of competition in various market segments of the telecommunications sector (Kaysen and Turner, 1959, pp. 53). This criterion pro-

[1] Other criteria may also be used when assessing the degree of competition.

vides an insight into how far the market shifts from a monopolistic market to a market with intense competition. Market shares and concentration levels refer to the degree to which a market is dominated by a small number of large firms or made up of many small firms (Knieps, 2005, pp. 49). In theory, the more evenly spread the market shares and the greater the numbers of firms, the more competitive the market. Clearly the lower the share of the former monopolist, the more developed the state of competition given that they all began with a 100% market share. Markets in which there are many providers with small market shares and a low level of concentration are presumed to be competitive. Yet, nothing can be said as to the level of competition on the basis of market shares and concentration figures alone. Concentrated markets can still be competitive to a large extent.

Market shares may be assessed either on the basis of volume (capacity, minutes, number of termination points etc.) or value of sales. In general, the most appropriate measures will be volume (i.e. wholesale conveyance minutes). Volume data should be used if there are no large differences in prices, since this minimizes the differences between results based on volume and value data. In practice, market shares are usually calculated using sales revenues instead of volumes. This is because figures on revenues are much easier to obtain. When measuring market shares as a criterion for assessing the competitiveness of a relevant market, the change in market shares over time may be considered as well. When a firm is constantly loosing market share starting at 100%, such a market is very dynamic. Competition is assumed to be higher than on a market where several firms have constant market shares.

One of the key objectives of competition policy is to widen choice to the customer. An indicator of such choice is the number of providers they can choose amongst. Under competition, the number of market players and their respective market shares are subject to more or less important variations over time. Therefore, a good indicator for functioning competition in the voice telephony market is the number of competitors which have succeeded in entering the market since its opening to competition almost one decade ago. If a significant number of entrants can be identified in connection with the shift of market shares from incumbents to these players (e.g. customer switching), this implies the existence of active competition.

2.2 Height of barriers to entry

Barriers to entry are essentially any market features that disadvantage (potential) new entrants vis-à-vis incumbents (Knieps, 2005, pp. 51). Three types of entry barriers are relevant for the purpose of analysing the competitiveness of relevant telecommunications markets:

1. Legal or regulatory barriers,
2. Structural barriers, and
3. Barriers to switching suppliers.

ad 1) Legal or regulatory barriers result from legislative, administrative or other state measures that have a direct effect on the conditions of entry and/or the positioning of operators on the relevant market. On liberalized fixed telecom markets they play a minor role.

ad 2) Structural barriers to entry result from original cost or demand conditions that create asymmetric conditions between incumbents and new entrants impeding or preventing market entry of the latter: Sunk costs, economies of scale, economies of scope, network effects are the most relevant ones in telecom industries, all of them occurring to a larger or smaller extent. To date, such structural barriers in telecom markets can in particular be identified in local access networks.

ad 3) Barriers to switching suppliers exist when consumers are reluctant to switching suppliers because of lengthy contracts with penalty clauses, high connection/disconnection fees, additional costs for new customer equipment, billing arrangements including separate bills, and the existence and effectiveness of number portability. The existence of switching costs can be a reason for customers to remain loyal to one service provider. If consumers already have a considerable investment in equipment necessary for services or are locked into long-term contracts, they will stick to current services and show inertia in the choice of services and carriers.

2.3 Competition in prices

The price competition criterion is the most important one with regard to market conduct. (Kaysen and Turner, 1959, pp. 53). After all, the price mechanism is the coordinating principle for a competitive market.[2] A decrease in retail prices is one desired outcome of liberalising telecom market. Therefore, the evolution of prices is a good indicator for the development of competition on telecom markets. It can be assumed that in a competitive market, operators will both, bring prices to a competitive level and profile themselves in terms of diverging tariff schemes.[3] This implies that the variable of tariffs/prices is important for assessing the competitiveness of a relevant market.

The degree of competition in a relevant market (and its dynamic) might be observed through the reactions on price setting of single providers and prevailing differences in prices over time (for homogenous products). For example, the ability to price at a level that keeps profits persistently and far above the competitive level is a visible sign that an operator has significant market power. As costs fall, prices should be expected to fall too, if competition is effective. Yet, there can be other reasons for price changes which need to be taken into account: a change in prices on the world market, economic recession, cost reductions as a result of technological inventions, legislation and regulations to mention some of them. This is particularly the case on telecom markets, where a large part of the retail price is fixed, because the interconnection charges to be paid b operators to the incumbent are regulated. Therefore they do not reflect competition. In consequence, the retail price can be analysed but conclusions must be drawn with caution.

[2] In empirical surveys on telecom markets consumers say that the price is by far the most important criterion for them when choosing between operators (Connect-online, 1999).

[3] Empirical studies confirm the relationship between competition and prices. For instance, Kaestner und Kahn (1990) show in a study on the impact of competition on prices for telephone services of AT&T that in those regions where the company was subject to competition by alternative operators tariffs were significantly lower than in other regions.

3 The regulatory framework for voice telephony services

3.1 The need for regulating liberalised telecom markets

During the last two decades most countries worldwide have liberalised their national markets for fixed telephony. With the transition to competitive telecom markets the former monopolists became dominant carriers having market power to restrict competition on the expense of other suppliers and of consumers. Consequently, countries have established new national regulatory frameworks in which specific regulatory instruments are employed which provide safeguards against unfair competition and market power.

From an economic perspective, the primary objective of regulating telecom markets is to support the development of efficient and sustainable competition by enabling both the entry of new companies into these markets as well as cost-minimising production. According to the concept of contestable markets, governments should only intervene into markets where barriers to entry exist. Such entry barriers can arise from additional costs which must be borne by entrants but not by firms already in the market.[4] Those markets which are not contestable should be regulated, because firms can distort or deter the developments of markets (Baumol et al., 1988, pp. 479).

Today it is common sense that in fixed telecommunication markets, the incumbent can deter the market entry of new providers.[5] Since new telecommunications providers do not own a nationwide network, they depend to some degree upon the network of the incumbent (Knieps, 2005, pp. 32). There is thus a risk that an undertaking with significant market power on telecom markets may act in various ways to inhibit entry or distort competition on retail markets.[6] To rule out anti-competitive behaviour of incumbents, governments in recent years have established regulatory rules for the provision and use of network services on telecom markets. One main objective of these regulatory rules is to overcome barriers for market entry. Depending on the extent to which these wholesale products are bottleneck facilities which cannot be replicated by reasonable means, some form of regulatory intervention is required (Kruse, 2001).

In addition, retail markets have partly been regulated as well, although such regulation is much more controversial. Once service providers have non-discriminatory access at cost-oriented prices to network elements of the incumbent, retail markets are usually competitive.[7] Operators with significant market power at the network level are then no longer able to abuse this power – for example by setting retail prices below costs in order to prevent competitors to successfully enter

[4] One reason for additional costs is control over essential facilities, which allow a firm to maintain prices above the competitive level without inducing entry. The refusal to supply an essential facility would increase the rival's costs.

[5] This is due to significant economies of scale and scope together with sunk costs in the provision of telecommunications networks.

[6] This is, for example by charging excessive prices, setting predatory prices, compulsory bundling of retail services or showing undue preference to certain customers. See for example, Dewenter and Haucap, 2004, p. 376.

[7] For a further discussion of this argument see Knieps, 1997.

the market.

3.2 German regulation of fixed telecommunication markets

3.2.1 Facilitating market entry of operators and service providers

Based on a comprehensive regulatory framework that provides for safeguards against unfair competition and market power, the German Regulator RegTP determined that Deutsche Telekom has significant market power in the various wholesale markets. Consequently and different from many other European countries, the German regulatory authority has been fast to implement the key enablers of competition: Interconnection, call by call capability of all customer lines in Germany, number portability, equal access, and nationwide unbundled access to the local loop (ULL) have all been available since January 1, 1998 (Dehmer, 1999, pp.59). Newcomers could therefore freely enter any segment of the market. The requirement to provide network services under equitable and non-discriminatory terms and conditions comprised providing network access at cost-oriented rates on an unbundled basis, including direct access to the line side of exchanges, co-location of interconnect equipment if requested, and the provision of the 'essential facilities' within Deutsche Telekom's network. The availability of these regulatory instruments from the very first day of liberalisation has made it extremely easy for new entrants to compete with the incumbent operator Deutsche Telekom.[8] But also other factors encouraged the development of competition: Licences were easy to obtain and the regulator had the independence from both government and incumbent to take strong and independent decisions. All of these circumstances have facilitated the entry of service providers without requiring them to invest in infrastructure.

3.2.2 Regulation of retail services

The European regulatory framework gives national regulators the power to impose retail regulation on an undertaking with significant market power. Once a given retail market is considered not to be effectively competitive, national Regulatory Authorities shall impose appropriate regulatory obligations on undertakings identified as having significant market power. Instruments to be used to achieve the objective of promoting effective competition are “Price Cap Regulation”, geographical averaging or similar instruments, as well as non-regulatory measures such as publicly available comparisons of retail tariffs.[9] By today nearly all European countries with liberalised telecommunications market regulate most of voice telephony services.[10]

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[8] Such an approach is not self-evident. Experience from other EU-countries demonstrates that they usually have taken a much more cautious approach to the introduction of basic regulatory tools such as local loop unbundling. For instance, France, Spain, UK and Ireland had not unbundled local loops during the first years of opening their telecom markets to competition.

[9] As a general rule European legislation requires regulators to take into account the principle that regulatory controls on retail services shall only be imposed where NRAs consider that relevant wholesale measures or measures regarding carrier selection or pre-selection would fail to achieve the objective of ensuring effective competition.

[10] Two exemptions are Sweden and Finland, where voice telephony services are no longer subject to regulatory measures, because the incumbents are not considered to have significant market power on these markets.

The legal framework ruling retail price regulation of telecommunications services in Germany is set in the Part 2 Chapter 3 of the Telecommunications Law of the TKG of June 22, 2004 (“TKG”). According to the Sections 39, regulation of retail tariffs can take two forms:

1. Approval of retail prices, and
2. Ex-post regulation.

The approval of retail prices may be imposed as a remedy by the Federal Network Agency “Bundesnetzagentur” (BNetzA) if wholesale remedies and carrier selection obligation do not suffice and sustainable competition is not expected to develop in the foreseeable future. It can be based on cost orientation or based on benchmarks prescribed for the price cap (the rate of price increases in the economy overall; the expected rate of growth in productivity of the SMP operator; and suitable secondary conditions for preventing abuse).

Ex-post regulation is applied on the rates, which are not subject to prior approval. Where the BNetzA becomes aware of facts warranting the assumption that rates are not in compliance with the requirements of § 28, the NRA shall open an investigation of the rates without undue delay and inform the undertaking concerned.

In the past, the regulation of retail tariffs in Germany has been done via the “price cap”. This approach has been applied since the opening of the telecom markets in 1998.[11] On December 21, 2001 REgTP changed the price cap regime for the period January 1, 2002 - December 31, 2004 by grouping telephony services in four different baskets: line rental in Basket A (RPI +1%), local call services in Basket B (RPI - 5%), long-distance calls in Basket C (RPI - 2%) and international calls in Basket D (RPI - 1%). decided on the price cap regime.[12] On July 23, 2003 RegTP granted approval for a rebalancing of Deutsche Telekom’s access and local call charges within the framework of the amended price cap regime. From September 1, 2003 the monthly analogue line rental has been increased by € 1.94 to € 15.66 (incl. VAT), the one-off installation charge for analogue lines has been increased by € 8.38 to € 59.95 (incl. VAT), the price for reactivating a subscriber line by € 4.18 to € 29.94 and local call charges have been reduced by almost 5% on average, according to Deutsche Telekom. On January 19, 2004 RegTP approved Deutsche Telekom’s application of December 15, 2003 for amendments to analogue and ISDN retail tariffs within the price cap regime[13].

3.2.3 Recent regulatory decisions

Based on the new regulatory framework from June 2004 the German regulator had to revise its previous regulatory decisions for voice telephony services. Thus, in November 2004 RegTP pub-

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[11] In 1997 it was decided by the regulator to have a CPI-X = 1,7% - 6% for the Period 1998 and 1999 for two different baskets: basket 1 for residentials and basket 2 for business users. Both baskets comprise the services City-Call, Regional Call, Long Distance Call, International Call, Monthly Rental and ISDN-Basic-Rental.

[12] See RegTP, Official Journal 2/2002, p. 75

[13] See See RegTP, Official Journal 4/2004, p. 155

lished for national consultation the results of its analysis of the retail markets for fixed telephony, covering access to the public telephone network at a fixed location, local and national telephone services, and international telephone services. The proposed market definitions did not distinguish between business and residential markets (as has been foreseen by the European Commission). DT has been found to have significant market power in all the three markets. Following this publication, on December 23, 2004 RegTP notified the European Commission of provisional measures requiring DT to inform RegTP of its rates for retail services for residential and non-residential customers two months in advance of their planned effective date, until the market analysis procedure was completed.

In May 2006 BNetzA notified its draft decision on regulatory obligations for operators with SMP in the retail markets for fixed access (markets 1 and 2), local and/or national telephone calls (markets 3 and 5), and international calls (markets 4 and 6). BNetzA did not include public payphones or broadband access in markets 1 and 2 because it found no demand-side substitutability with traditional fixed voice telephony access. In markets 3 and 5, BNetzA included VoIP services, national calls via direct access and carrier pre-selection because of demand-side substitutability, but only if these services are provided at a fixed location. Moreover, BNetzA did not distinguish between the markets for residential and non-residential customers because it found no clear-cut separation between these customer groups.

Following its decision to designate DT as having SMP in markets 1-3 and 5, BNetzA proposed the following regulatory obligations:

§ For markets 1 and 2, BNetzA proposed carrier selection (CS) and carrier pre-selection (CPS) and price control, in the form of notifying BNetzA of tariffs two months in advance. The agency did not find DT's existing wholesale obligations sufficient, especially because of the possibility of predatory pricing and price squeeze.[14]

§ For markets 3 and 5 (local and national voice services including Voice over IP), BNetzA proposed price control in the form of notifying BNetzA of tariffs two months in advance.

The reason for designating DT as having SMP on these markets has been due to a market share of more than 50% in these markets (as measured by the sales volume in 2004). Furthermore, BNetzA argued that customers do not have countervailing buyer power; and DT's vertical integration gives it a stronger market position vis-à-vis its competitors because it can offer bundled services that cannot be replicated by competitors and it is less dependent on external suppliers. For markets 4 and 6 (international telephone services for residential and business customers), BNetzA proposed to withdraw existing regulations due to effective competition.[15]

[14] Therefore it considered that the ex-post control of retail tariffs would not be sufficient. On the other hand, the obligation to have approved tariffs would be burdensome for DT.

[15] BNetzA considers the market for international telephone services (markets 4 and 6) to be effectively competitive because DT has a market share of less than 30% (measured in call minutes).

Following criticism by the European Commission[16], on June 23, 2006 BNetzA adopted a final decision on regulatory obligations, with no changes being made to the draft decision one month before. BNetzA considered that the ex post price control on DT in the form of notifying BNetzA two months in advance is not only a means of transparency, but also an effective mechanism to prevent anticompetitive pricing (predatory pricing, price squeeze, illegal bundling, or excessive prices). The obligation to have approved ex-ante tariffs would be too burdensome for DT. Moreover, BNetzA did not impose cost orientation for CS/CPS, arguing that DT's price for implementation of CPS (€4.40) was moderate compared to the prices of other operators (RegtTP, 2003b).[17] Finally, BNetzA did neither see the necessity of imposing accounting separation. In previous years, high prices in the retail sector were not too high and the main issues for regulation (predatory pricing, price-squeeze and product bundling) can be investigated without requiring accounting separation, because the relevant wholesale prices such as for interconnection are well known.

4 Empirical Evidence for Competition on the German Market for Voice Telephony

4.1 Height of barrier to entry

Legal barriers

Until 2003 the provision of telecommunications networks and services was in Germany subject to an individual licence. The old German Law defined 4 licences classes. For the offer of voice telephony on the basis of self-operated telecommunications networks a so-called “Class 4-license” was necessary. Moreover, special obligations for telephony license holders were laid down: the provision of customer data for directory purposes, the provision of free emergency calls for end users and accounting separation for activities covered by the licence and activities outsides the scope of the licence. This need to require prior permission and to provide proof of having fulfilled numerous conditions, created an unnecessary bottleneck for the free provision of telecommunications networks and services. Moreover, during the first years of liberalised telecom markets operators had to pay extremely high licence fees. For a national licence the “one-off” fee was between €1.5m and €5.4m. Yet, as demonstrated below by figures on market entry, the market entry barrier was not a very burdensome, despite the initial high cost of German licences. In early 2003, 5 years after the opening of telecom markets, the regulator had issued already 328 class 4 licenses for the provision of voice telephony and 1320 class 3 licenses for the provision of network services (RegtTP, 2003c). Whilst €5.4m is a large sum of money compared to the business potential it is a relatively low barrier to entry.

[16] The European Commission criticised the lack of an accounting separation obligation and the effectiveness of the proposed 2-month advance notice period for retail tariffs in resolving the identified market failure. It also required the pricing of interconnection services related to the provision of CS/CPS to be offered on a cost oriented basis.

[17] Market data showed that CPS traffic increased by 45% between 2002 and 2004, and the number of CPS subscribers increased from 4 to more than 6 million. This proved to BNetzA that subscribers did not consider CPS prices to be too high.

With the transposition of the new EU regulatory framework by the new "Telecommunications Act" in June 2004 Germany does longer use the instrument of individual licences to regulate the electronic communications sector. Thus, with the new legislation in place providers of voice telephony services no longer need to obtain an explicit administrative decision before starting business. Authorities may ask for notification in order to keep a register, but the provider of the electronic communications network or service does not have to wait for the reply to this notification, nor should be asked to provide more information than necessary for the identification of the company. In other words, there are no barriers to market entry that may result from legal or administrative measures which negatively affect the conditions for market entry.

Structural barriers

One may argue that there are still structural barriers of market entry such as sunk costs and relative cost advantages of the incumbent (economies of scale and economies of scope). This may still be the case for certain network segments (Knieps, 2005, pp. 28). As for fixed retail markets sunk costs which result from investment that could not be earned back if the undertaking left the market are rather small. Potential market entrants are able to access cost intensive network elements of the incumbent, thus avoiding high investments. Also relative cost advantages in the form of economies of scale and/or economies of scope[18] are if at all rather low on fixed retail markets. For instance, the costs for local switching per call minute respectively per call minute (i.e. per unit of output) are typically the smaller the more calls are made. To sum up, structural entry barriers are relatively low in the markets for fixed telephony services because alternative operators are able to acquire the necessary wholesale inputs for voice telephony either from Deutsche Telekom at regulated (and thus cost-oriented) conditions or alternatively from other network operators.

Barriers to switching suppliers

Two different types of switching costs might be distinguished when considering fixed telecom markets. First, being informed about the institutional setting for switching to another operator than Deutsche Telekom and second, given being informed, switching between different providers. Today, nearly ten years after the liberalisation of the German telecom market it can reasonably be assumed that almost all consumers are familiar with the institutional setting of the market. For this group, the initial set-up costs to get familiar with the institutional setting are rather low, as compared to the expected cut in their telephone costs. Assuming that consumers are informed about the options of call selection, switching costs are very low (Brunekreeft and Gross, 1999, p. 8). This is particularly the case for those consumers using call-by-call. The only burden to be taken by them, compared with using the incumbent provider, is dialling the 5- or 6digit carrier

[18] Economies of scope incur when certain network elements can be simultaneously used for the provision of different types of services. For instance, the simultaneous provision of telephone services ("call minutes") and leased lines is typically less expensive than their separate provision because the same transmission links can be used for the two types of services.

selection code.[19] One reason for the very low switching costs when using call-by-call has been the introduction of third party billing. Thereby, a caller using carrier selection on a call-by-call basis would pay the service provider via their normal telephone bill of Deutsche Telekom, even if it was for just one call. This rule made it very easy for the customer, as he only had one bill, and easy for the service provider who did not have to set up separate payment and credit systems for their customers. From the new entrants' perspective, the rules on third party billing represent a very low barrier to market development. This system helped to drive competition.

Also for those consumers, which prefer a pre-selection service, costs of switching are rather low. With operator number portability being in place right from the start of liberalising telecom markets the costs for consumers are normally restricted to filling in a registration form. The same holds true for consumers deciding to switch completely to an alternative network operator. Last but not least, also search costs in terms of finding the cheapest provider are extremely low. Today brokers and agencies provide information on telephone tariffs and also the internet and printed media are full of price information. Moreover, the operators themselves advertise aggressively with tariffs.

To conclude, market entrance and the possibility to compete freely in the various market segments market are not hindered. Legal barriers to entry do not exist and none of the voice telephony markets are characterised by high or non-transitory structural barriers to entry. In theory, access to infrastructure for the provision of telephone services could represent a main entry barrier to voice telephony markets. Yet, in Germany this barrier was eliminated in 1998 with introduction of an obligation for DT to provide carrier selection and pre-selection as well as obligations on access, cost orientation and non-discrimination in the fixed wholesale markets for call origination, termination and transit. Moreover, barriers to switching suppliers hardly exist for customers, which is why competition on voice telephony markets is not hindered by entry barriers.

4.2 Level of concentration

With the liberalisation of the German telecom market in 1998, right from the start, there was a large number of market players offering call-by-call and pre-selection services to consumers. Only 15 months after the liberalisation, in April 1999, three major alternative network operators[20], and 21 so called switch-based service providers were offering nationwide voice telephony services (Brunekreeft and Gross, 1999, p. 18). In mid-2005, 95 network operators had concluded an agreement with Deutsche Telekom on the rent of the unbundled local loop and two years later, in mid-2007 there were already 105 ULL agreements. As to interconnection agreement there was a rapid increase in from 22 in 1998 to 117 in 2000. The following years the number of alternative operators offering telephony services on the basis of interconnection agreements has remained stable (112 in 2005). This was a result of the increased number of unbundled lines and increased

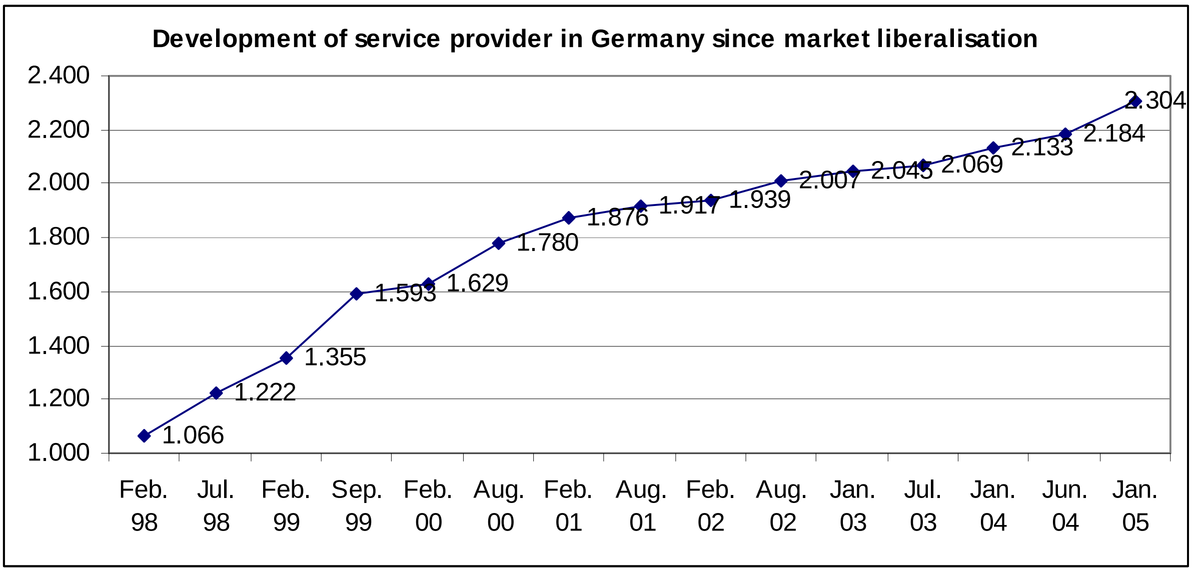
[19] Today, most telephones allow programming of selected numbers and leased-cost routers can be bought which find the cheapest provider on a call-by-call basis automatically.

[20] These operators were Arcor, o.tel.o, and Viag Interkom.

investment in networks. Yet, in recent years there was another rise in the number of IC agreements, reaching 148 in 2007 according to information from BNetzA.

Also when looking at the overall telecom market, one can observe a steady increase in the number of service providers. In all telecom markets there were already more than 2300 companies registered with BNetzA in 2005, most of them offering some kind of network management service such as Internet access services. 416 companies were providing voice services in the fixed network, of which around 100 were offering call by call, pre-selection or direct access over their own core and access networks. Out of these operators, 85 service providers were offering analogue lines, ISDN lines or cable connections either on the basis of local loop or via their own access networks at the end of 2006.[21] According to EU sources both the number of authorised public fixed network operators and the number of operators actually offering public voice telephony has been the highest among EU countries in 2006 (European Commission, 2007b, pp. 9).

Graph 4-1: Number of service provider in German telecommunication market



Source: BNetzA, Annual Report 2004, p. 21.

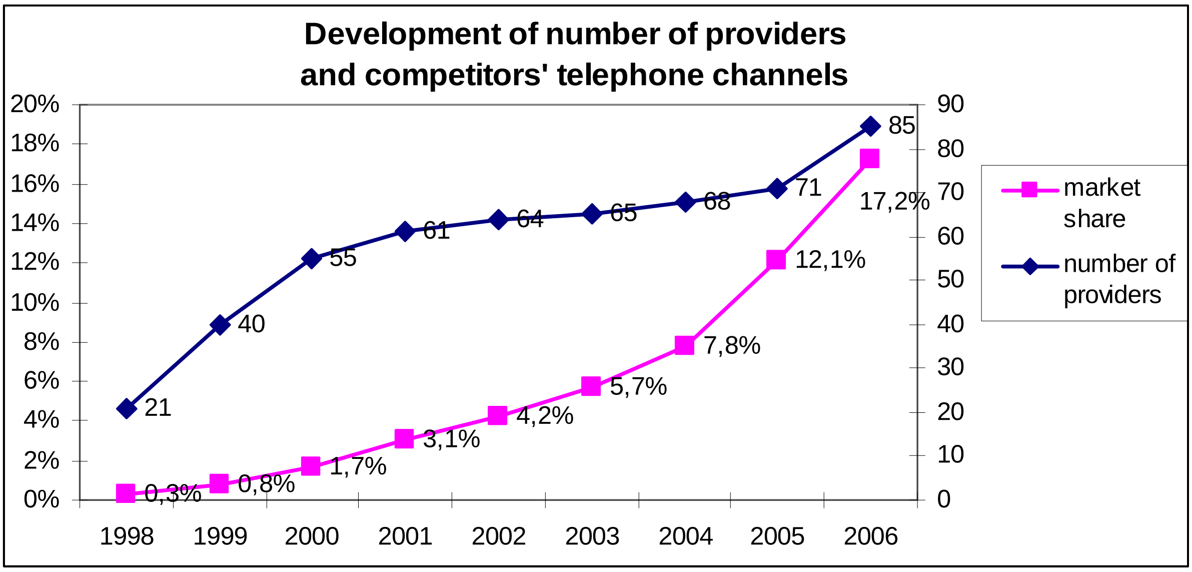
As a result of vigorous market entry by alternative operators and service providers, DT's market share for voice telephony constantly declined. Figures show that Deutsche Telekom lost a huge number of customers in recent years. Within two years, between 2004 and 2006, competitors of Deutsche Telekom increased their market share of total number of channels from 7.8% to 17.2% and thus by more than 100% (BNetzA, 2007, p. 60).[22] In some regions of Germany the market share of alternative network operators is already higher than 25%. Accordingly, the number of narrowband lines owned by Deutsche Telekom continues to decline. Latest figures published by

[21] By the end of 2006 the number of access lines via cable TV have been 0.5 Mio. (BNetzA, 2007, p. 62).

[22] The share of total number of lines (including analogue lines, ISDN lines and cable TV lines) rose from 5.1% to 13.1%.

Deutsche Telekom show that these lines decreased in 2006 by 5.7 percent to 33.2 million (2005: 35.2 million). Half a year later, in June 2007, the number of narrowband lines dropped by another million to 32,1 million, a further decline of more than 2,5% (Deutsche Telekom, 2007, p. 28).[23] At the same time, the number of local loop lines grew by 1.5 million from 4 million in June 2006 to 5.5 million in June 2007. This is an increase of more than 35% within one year. Thus, a major reason for the decrease in narrowband lines is customer churn in favor of fixed-network competitors. According to Deutsche Telekom the line losses are also the result of "migration of customers to cable network operators and, increasingly, fixed-mobile substitution" (Deutsche Telekom, 2007, p. 29).

Graph 4-2: Number of competitors and their market share of telephone channels



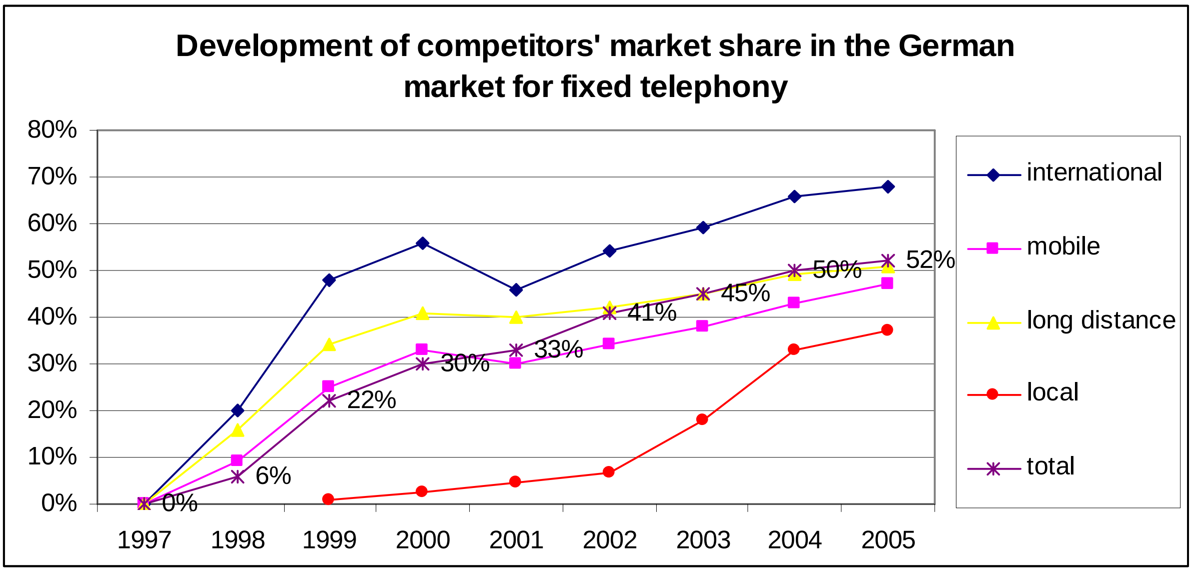
Source: BNetzA, Annual Report 2006, p. 58

Looking at traffic volumes, figures demonstrate that competitors were strong right from the start. By the end of 1998, just one year after liberalisation, already 17 % of all German households were actively using long-distance services from other providers than the incumbent, while 32% claimed that they were going to do so in the following months´ (Hochköpper & Plica, 1999). Today, less than ten years after opening voice telephony markets, in 2005, the market share of Deutsche Telekom was already below 50% in most fixed market segments. According to the Federal Network Agency, competitors increased their fixed-network call minutes in the fixed network to a total of 178 billion minutes in 2005 (52%), with Deutsche Telekom's share of 159 million minutes (48%) decreasing further (BNetzA, 2005, p. 26). When comparing the market shares of different voice services one can observe that the share of local calls offered by competitors had the highest growth rates in recent years, increasing from 6,7% in 2002 to already 37% in 2005

[23] At 9.0 million, also the total number of T-ISDN lines decreased by a high 8.2 percent year-on-year (2005: 9.8 million).Partly, this is attributable in part to DSL customers switching from T-ISDN to an analog T-Net line.

(BNetzA, 2005, p. 28). During the same period, the market share for long distance calls went up from 42% to 51%. Competitors of the incumbents were especially successful in selling international calls. This market share was already 68% and thus more than two third in 2005.

Graph 4-3: Development of market shares of competitors in Germany

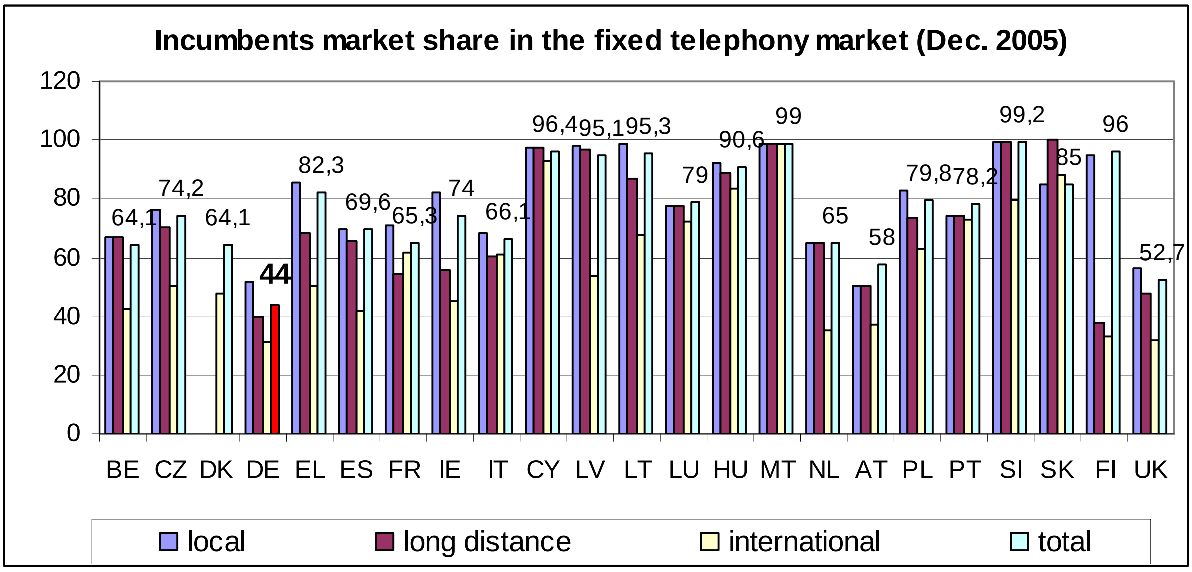


Source: BNetzA (2005), Tätigkeitsbericht 2004/2005, pp. 28

When comparing these figures with those in other European countries, it becomes evident that Deutsche Telekom had the highest loss of market shares in the fixed telephony market. According to the latest EU implementation report, Deutsche Telekom had the lowest market share in the overall fixed voice telephony market among all incumbents in the EU (European Commission, 2007a, pp. 22). While the EU average incumbents' market share on the basis of volume of traffic was 63.9% in December 2005 (by retail revenues it was 65.8% respectively), Deutsche Telekom's market share was only 44% (by retail revenues 55%) and thus 50% lower than the EU average.[24]

[24] For the different market segments, the market shares of Deutsche Telekom in terms of traffic volume were 40% for local calls, 52% for long distance calls and 31% for international calls.

Graph 4-4: Market shares of incumbents: Deutsche Telekom vs. EU average



Source: European Commission, 2007b, pp. 14

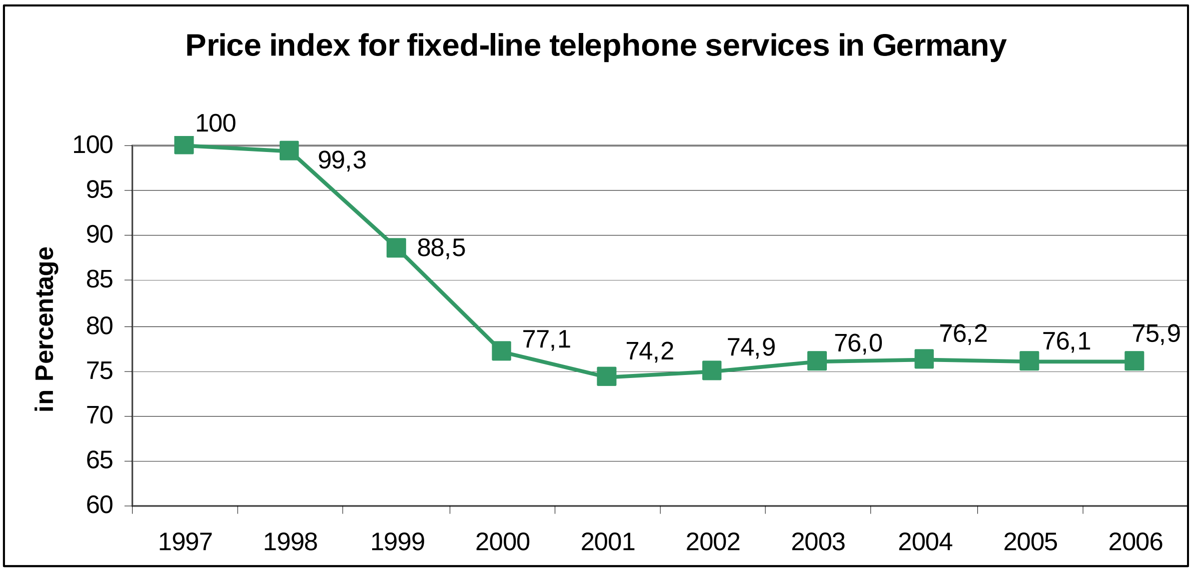
To sum up, a large number of new operators and/or service providers have succeeded in entering the German voice telephony market since its opening to competition almost one decade ago. Currently there are more than 150 alternative providers of telephony services in Germany, several of which were established in recent years. These service providers were rather successful in shifting market shares from DT to them. DT's market share in all voice telephony markets has fallen considerably since 1998, on most markets below 50%. These figures suggest that not only is there potential competition in the German voice telephony market, but also active competition.

4.3 Tariff developments within the market for voice telephony

We now want to take a look at the development of prices at the German market for voices telephony services. A striking feature is that prices charged by DT have been continuously lowered over recent years. In 1991 the predecessor of Deutsche Telekom, Deutsche Bundespost, offered international calls to other OECD countries, at a price of 1 US $ (about 1 €) per minute in average (OECD, 1999, p. 177). Also national calls were nearly as expensive. In contrast, local calls were relatively cheap: Deutsche Bundespost charged a price of 0,23 DM (about 0,12 €-cents) for a 3-minute call in 1991 (ICU, 2001, p. 67). The situation just before the liberalisation of the German fixed telecom market was hardly any different: In 1997, for international calls to countries within the OECD Deutsche Telekom still charged a price of 0,7 US $ per minute (OECD, 1999, p. 177) and for a long-distance call customers had to pay a price between 0,24 an 0,6 DM (RegTP, 2000, p. 9). Thus, at the start of the liberalisation market prices for fixed calls were rather high. Due to the former monopolistic position of Deutsche Telekom, competition in the fixed market was at that time comparatively low. However, this situation changed very soon with the market entry of numerous firms.

The liberalisation of telephony markets in 1998 led to a sharp reduction of tariffs for voice services. Between January 1998 and April 1999, Deutsche Telekom lowered its average prices during a day by 62%, the alternative network operators by 66% and the service providers by 52% (Brunekreeft and Gross 1999, p. 17). In the following years, prices for fixed voice telephony services were lowered further (1999: -20,5 %, 2000: -9%, 2001: -4,3 %). Detailed information is offered by the Federal Statistical Office (Statistisches Bundesamt), where the price index for fixed services is published regularly. As is shown in the following graph price developments are published for different service: the monthly subscription charge, local calls, national calls, calls to mobile phones and international calls. In all call segments prices have fallen steadily. Price decreases were very large during the first years of liberalisation. As can be seen from the graph above, between 1998 and 2001 prices for fixed voice telephony services have fallen by 25%.[25] In the following years prices have remained stable, despite an average annual inflation of 2% in Germany.

Graph 4-5: Price development for fixed- since 1997



Source: Statistisches Bundesamt, 2007a

Differences in price developments can be observed for submarkets. Within less than two years, between 1998 and 2000, prices for national long distance calls and international calls have been cut in half. On the other hand, different from tariffs for national and international calls, tariffs for local calls have hardly changed between 1998 and 2003. During this period alternative operators were only able to offer such services via unbundled local loop. Call-by-call selection and pre-selection were both not possible until then. The situation changed in 2003, when Deutsche Tele-

[25] This price decrease is even more meaningful if one takes into account that during the same period, the German consumer price index rose by more than 13% (Statistisches Bundesamt, 2007b).

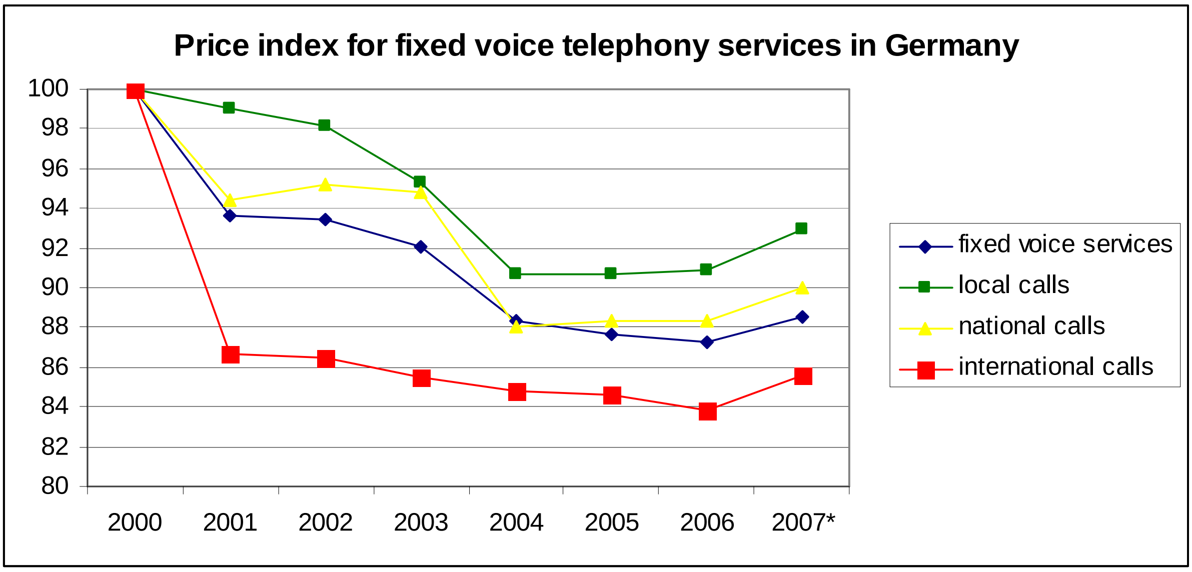
kom was obliged to provide call-by-call selection and pre-selection for local calls. Once established in April 2003, many new service providers entered this market segment, putting pressure on tariffs. Thus, during the years from 2003 to 2006 prices for all call segments dropped: local calls by 10,3%, national calls by 13,1% and international calls by 3%. Only the monthly subscriber charge increased by 17,7% during this period.

Table 4-1: Price changes for fixed-line telephone services

Fixed-line telephone services	Price changes to previous year, in %				
	2003	2004	2005	2006	2007
monthly subscription charge	10,2	6	0,8	+/– 0,0	1,8
local calls	-5,6	– 4,8	+/– 0,0	0,2	2,3
national calls	-6,1	– 7,2	0,3	+/– 0,0	1,9
international calls	-0,8	– 0,8	– 0,2	– 0,9	0,5

Source: Statistisches Bundesamt, 2007c

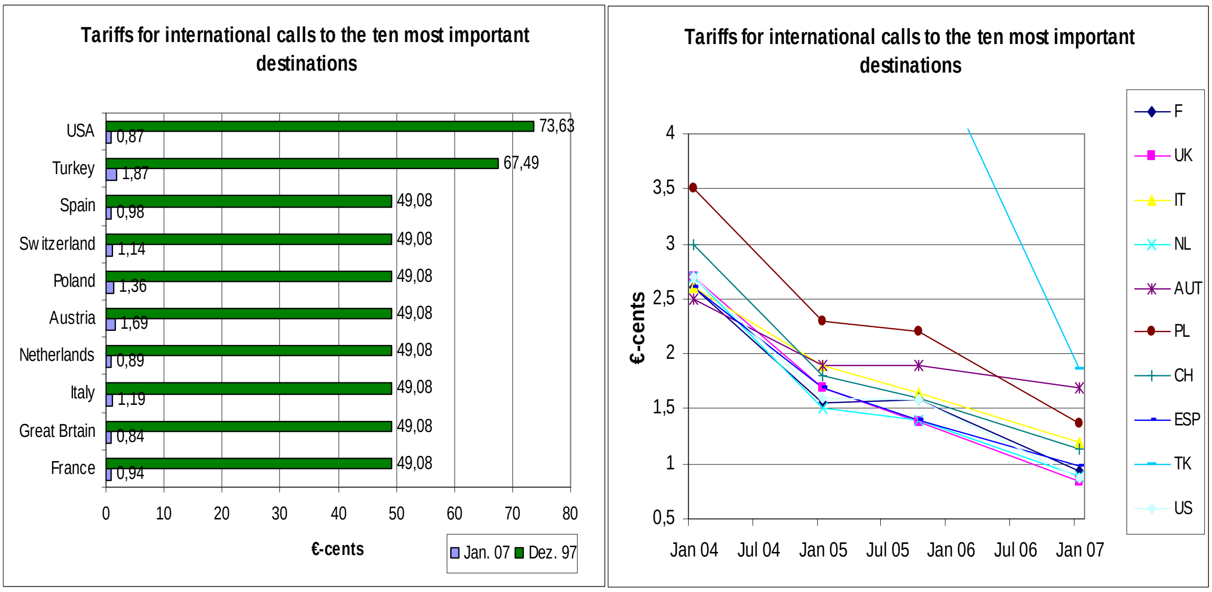
Graph 4-6: Price development for fixed voice telephone services since 2000



Source: Statistisches Bundesamt, 2007c

During the whole period since markets have been liberalised the strongest price decline has taken place in the sub-market for international calls (in average 75%). This becomes particularly evident when looking at the tariffs for calls to the ten most important destination countries. As is demonstrated in the following graph prices decreased up to 95%. For instance, in 2006 prices for international calls to many of the European neighbour countries but also for calls to the United States can be made for less than 1 €-cent per minute (BNetzA, 2007, p. 73).

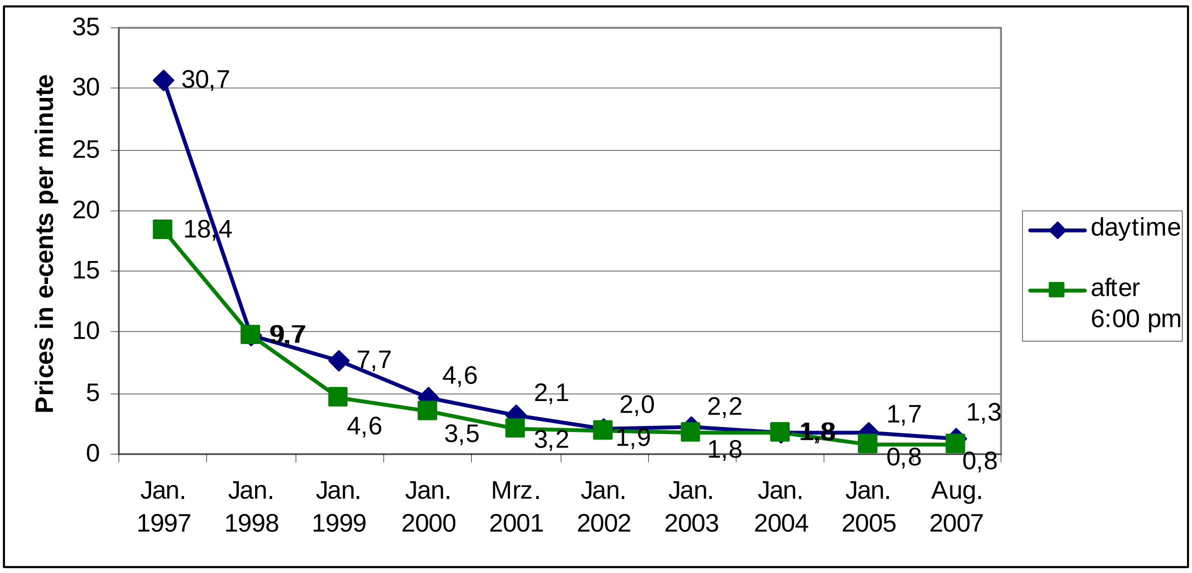
Graph 4-5: Market shares of incumbents: Deutsche Telekom vs. EU average



Source: RegTP, 2004, p.31, RegTP, 2005, p. 40, BNetzA 2007, p. 73

Also the prices for national calls steadily declined. For instance, minimum standard prices on a call-by-call basis for fixed national calls on weekdays are now, depending the time of day, just four percent of what they were before market liberalisation. With call by call, it is even possible to make national calls for less than one cent. The downward trend in prices for national weekday calls continued in 2007. The following graph illustrates price trends for indirect access calls delivered by the cheapest provider.

Graph 4-5: Minimum standard prices (call-by-call) for fixed national calls, weekdays



Source: BNetzA (2005), Tätigkeitsbericht 2004/2005, p. 34, own research

Germany has seen significant price falls in the years since the liberalisation of telecom markets, particularly in call charges. The reasons for the huge downward pressure on prices for all type of voice calls (local, national and international calls) are manifold. One reason for the decline of tariffs is greater economies of scale: The average cost of a unit of telecommunications output tends to reduce markedly as the network expands. Another reason is decreasing prices of telecommunications equipment over time.[26] Because of this cost-oriented wholesale prices for interconnection have been reduced by the regulator in recent years.

Besides these cost-induced effects, price cuts for voice telephony services are to a large extent the consequence of competition between operators. Operators try to offer cheaper tariffs to the consumer to be more competitive. This leads to decreasing prices on the voice telephony market. Furthermore, they have to offer lower prices because of the growing relevancy of service provider and their cheap offerings. Moreover, in recent years, various new tariff schemes/options have been introduced by providers of fixed voice telephony services: DSL-equipment free of charge, waiving of the one-of connection fee, free phone calls and free internet telephony between their customers are some of them (BNetzA, 2006, p. 37). The fact that operators try to profile themselves in terms of diverging tariff schemes is a conduct which can be found when markets are highly competitive. There is no indication that the degree of competition will decrease in the following years. To the contrary, a high degree of competition is expected throughout the next years, with volume-based prices for voice telephony being more and more replaced by flatrates (Neumann, 2006, p. 94).

5 Sustainable competition and the future regulation of fixed telecom services

Since the very first day of liberalising the German telecommunications market in January 1998, Deutsche Telekom has had to cope with intense competition. Germany’s approach allowed new operators to enter the market rapidly offering a variety of services. At the current stage of market development, 10 years after liberalising the German fixed telecom market, indicators suggest that sustainable competition has developed in the various market segments in voice telephony. Entry barriers hardly exist and both the number of operators offering voice services but also the development of market shares suggest that not only is there potential competition but also active competition. When looking at the development of prices the conclusion is that price competition on the German market for voice telephony is very high. Especially during the first years after the liberalisation of voice telephony markets prices fall sharply. This is a clear sign for intense competition. Today prices for national and international calls are less than 5% of what they were before liberalisation.

Against this background the markets for “publicly available fixed local and/or national telephone

[26] Today the costs of the telecommunication network are not any longer determined by distance, but by digital switching technology which is subject to the same price cuts as computer technology.

services" (markets 3 and 5 in the EU terminology) may no longer be regulated. Because the voice telephony markets in Germany are not characterised by high or non-transitory barriers to entry, but to the contrary very dynamic in terms of market entry and price developments, they should not be relevant for ex-ante regulation. BNetzA therefore may consider ensuring competition in these markets by keeping carrier selection/carrier pre-selection obligations on DT. This is because the competitiveness of voice telephony markets depends to a large extent on the imposition of carrier selection/carrier pre-selection (CS/CPS) obligations on DT. As long as DT has SMP in the related retail market for access to the fixed public telephone network, these obligations may be maintained, as stipulated in section 40 of the Telecommunications Law.

On the other hand, a future objective of regulatory intervention should be to foster the development of infrastructure competition. Against this background it may be considered to remove also the regulatory provisions on call-by-call and pre-selection for local calls. This is because the provision can be criticised on several grounds. One argument against such a regulatory provision is that it reduces the attractiveness of alternative network-based operators from the customer perspective (Haucap, 2006, p. 166). With customers of DT having the choice to make cheap local calls via call-by-call, their incentive to switch to another operator is certainly lower.

The future challenge of regulating fixed telephony services will be to fully apply the principle of minimalist regulation. There is certainly a need to ensure that access to the network and services of a potentially dominant provider in a relevant market will satisfy requirements for openness and non-discrimination. Certain wholesale remedies may still be necessary. Any regulatory measure which goes beyond this can be overregulation of already competitive markets. BNetzA should be careful of not regulating too early and take into account "long-term risks and reward aspect".

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