Submission to the European Commission’s Public Consultation on

Review of the functioning of Regulation (EC) No 544/2009 (the "Roaming Regulation")

NON-Confidential Version

Deutsche Telekom AG (DTAG)
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1. Executive Summary

Deutsche Telekom Group welcomes the opportunity to contribute to the EU Commission’s review of the functioning of the Roaming Regulation.

(1) First of all and before diving into the details of the consultation’s questions and the current debate we would like to recall the benefits of international roaming as a service. One of the great advantages of today’s roaming experience is that it is so simple. Any (European) mobile customer is able to make and receive calls, send and receive SMS and use mobile data services in every Member State of the European Union (and around the world) by using his/her mobile phone and number - without any special effort - simply by switching on the mobile phone. This easy to use and flexible roaming system gives a “feel like at home” experience, which helps to overcome people’s inhibitions to cross borders and therefore also contributes to the European integration. Therefore any regulatory intervention should avoid making roaming less attractive for users.

(2) Although the Commission claimed that competition is not yet strong enough and recognized that the roaming regulation has inhibited rather than increased competition it should be acknowledged that several mobile network operators and operator groups like Deutsche Telekom already offer tariffs – as an alternative to the regulated Eurotariff – which provide more attractive offers, price reductions, full cost-control, easy-to-use and worry-free roaming experience to their customers. Especially with regard to data roaming competition is evolving quite well and further development of competition should not be hampered by a regulation restricting operator’s flexibility to develop innovative tariffs.

(3) With regard to the objective of contributing to a single market for roaming services, we today have a situation in which every European citizen choosing the regulated tariff (“Eurotariff”) knows that he/she will be charged a certain price independent from the concrete Member State he/she is travelling to. But a well functioning single market for roaming services does not require the abolishment of all differences between domestic and roaming charges. European legislation does not require a “total harmonisation”.

(4) In this context the Commission’s Digital Agenda for Europe (DAE)¹ key target that “the difference between roaming and national tariffs should approach zero by 2015” completely disregards the significant differences in domestic price levels due to specific national preconditions in the European countries. As a matter of fact roaming usage & -services cannot be directly compared with domestic usage & -services. Therefore it does not make any sense to focus on domestic rates in the home or visited country as a reference for roaming prices. Any regulatory approach aligning roaming to domestic prices would undermine competition, investment and consumer interests by creating large-scale price arbitrage opportunities between national markets. Thus such an approach would cause disruption to the market and oppose a fair competition. As the Commission’s DAE target has been set without undertaking a detailed impact assessment, the present review however offers the chance to redefine policy goals in the area of roaming and to focus on changes to the current regulation which better meet the political targets in a proportionate way.

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(5) As concluded by BEREC in its report on “International Mobile Roaming Regulation”\(^2\) we agree that there is no structural alternative form of regulation which provides advantages that could outweigh the disadvantages. Most of the alternatives proposed – especially the decoupling or unbundling approaches - would make roaming a significantly more complex and less attractive service for customers and would also incur significant additional investment for a challenging time and resource consuming technical implementation on the mobile network operators’ side. Due to necessary changes to the GSM standard (which would have to be changed by a number of the structural alternatives) any European implementation would also have to be aligned worldwide with the standardisation bodies – and thus an implementation would at least take two years and more and could still lead to an insular European solution.

(6) The structural alternatives of “access-based” approaches would impose an obligation upon operators to provide access to MVNOs on their networks. Especially the approach “Mandating full wholesale access for MVNOs to mobile networks in the home market for all services (not just roaming)” significantly goes beyond the current discussion topic of roaming. Imposing one out of the described access-based approaches without considering the preconditions for regulatory access obligations such as market dominance would be disproportionate and contradictory with regard to sector-specific regulatory practice in Europe.

(7) If (price) regulation will further be regarded necessary by the Commission any prolongation of the current regulation and any regulatory approach should ensure that wholesale and retail caps for roaming services allow mobile network operators to compete by differentiating their offerings and adapting their pricing structures to consumer preferences as well as to market conditions and necessities. Regulation should not hamper necessary tariff innovations but – on the contrary – should leave the necessary flexibility to mobile operators in order to allow for increased competition.

(8) Especially with regard to Data roaming a different approach to linear price caps is required as data (roaming) services fundamentally differ from voice or SMS (roaming) services – showing a wide heterogeneous range of service categories and applications with an enormous spread of data volumes. Crude linear per kilobyte charging models would result in enormously deviating bills and thereby making differentiated offers virtually impossible. As currently a variety of new and innovative data roaming offers with very attractive prices per MB are entering the market it would be the totally wrong signal to intervene in such an evolving market with retail price regulation. To the contrary it would slow down operators’ current activities to launch new innovations and tailor-made services.

(9) Any future regulation should target to improve the conditions for both European consumers and European mobile operators. Any further measures should thus leave the necessary flexibility to operators to urge innovative offers and thereby promote competition. Technically challenging and costly implementation obligations should be avoided, even more if outcome and impact of new solutions are uncertain. In any case disruption to the telecommunications industry and to its economic contribution to the European economy have to be avoided. And, as already stated at the beginning, any approach should always consider the user experience and keep roaming as simple and as user friendly as it is nowadays.

Deutsche Telekom will be glad to continue the debate about the future of the roaming regulation once the results of this consultation and the impact assessment are published.

\(^2\) [http://www.erg.eu.int/doc/berec/bor_10_58.pdf](http://www.erg.eu.int/doc/berec/bor_10_58.pdf) – hereafter referred to as “BEREC Report”
2. Deutsche Telekom’s way forward

2.1. Data Roaming

Deutsche Telekom has always been on the forefront of developing innovative mobile data services. Already in mid 2005 – with the introduction of web’n’walk – the mobile internet was accessible for Deutsche Telekom’s customers.

With regard to roaming services Deutsche Telekom was among the first operators to offer highly attractive data roaming tariffs to its customers. In mid 2008 T-Mobile Germany offered a Roaming-DayPass for 15 EUR including 50 Megabytes (an average price of 0,30 EUR per MB). Another good example is “T-Mobile Euro Booster”, introduced in March 2010 in the UK with prices down to 0,24 EUR per MB. Customers highly appreciate these offers – especially as they have full control of their expenditures whilst using the mobile internet abroad.

In accordance with the claim "Life is for sharing." Deutsche Telekom strongly believes that their customers should easily be able to use the internet wherever they are to stay in touch with family and friends and wherever they are within Europe. Therefore mobile internet usage abroad should be worry-free and as easy as at home based on a “One Zone within Europe” concept and no network differentiation.

The Deutsche Telekom group now tears down the borders for their customers by launching a new data roaming retail tariff concept portfolio which will be offered across Deutsche Telekom’s European footprint in Q2/Q3 2011 and beyond.

Whenever customers want data access while being abroad they will at first be directed to a cost-free landing page (LP) where a portfolio of passes is presented which they can choose from. In addition booking of these passes based on SMS will be possible as well. The pricing portfolio of passes is designed as such that different use cases (occasional vs. frequent traveller and low vs. high usage) are covered.

### New Data Pass Portfolio valid for all EU countries

<table>
<thead>
<tr>
<th>Pass Type</th>
<th>Price</th>
<th>Data Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily</td>
<td>x €</td>
<td>5-10 MB</td>
</tr>
<tr>
<td>Daily</td>
<td>y €</td>
<td>30-50 MB</td>
</tr>
<tr>
<td>Weekly</td>
<td>z €</td>
<td>100-150 MB</td>
</tr>
</tbody>
</table>

- Small Daily Pass for “for less then a price for a cappuccino”
- Medium Daily Pass with highly attractive volume
- Weekly Pass with even more volume suitable for any kind of internet activity

In the low end of the new pass portfolio the customers have the opportunity to buy a small pass in order to check e-mails or to stay in touch with friends in the respective social network “for less then a price for a cappuccino”. Users with a need for larger data volumes can choose another day-pass based on a larger data volume. And furthermore even a weekly flatrate (with speed step down) will be available. The average price per Megabyte for this kind of offers will be around and below 20ct/MB and will therefore be close to domestic price levels. Besides a strong price reduction the new tariff concept for data roaming provides a worry-free roaming experience with full cost control. Customers will have full transparency, as they will only be charged if they have selected a roaming pass, and there are no hidden cost after a pass
has expired in time or volume. Thus the new pass portfolio is a unique combination of excellent price & value relation, full cost control and ease of use – and it completely removes the ‘bill shock’ problem.

Deutsche Telekom’s new tariffs for data roaming show that this market is developing in a nascent but already competitive environment characterized by high growth and falling prices.

2.2. **Voice Roaming**

Besides the regulated Eurotariff the Deutsche Telekom group offers alternative voice roaming tariffs in various EU operations. As an example in Germany the alternative roaming tariff “Smart Traveller” enables the customers of Telekom Deutschland (TD) to use their minutes from national bundles also when being abroad. After the consumption of the included minutes the price per minute is the same like at home. The only difference between a domestic and a roaming call is a fair call-setup fee on incoming and outgoing calls. Asides from this call-setup fee the customer has a real “Roam like home” experience. This is especially attractive for incoming calls as the customers of Telekom Deutschland will only be charged the setup fee and than have 60 minutes free of charge.

**TD’s new domestic Portfolio already “Roam like Home”**

- Inclusive domestic minutes can also be used for roaming
- Roaming pay-for-use price after consumption of inclusive minutes is the same as for domestic
3. Consultation Questionnaire

At first we would like to draw the Commission’s attention to some general remarks of the current roaming business in the context with the EU Roaming Regulation, especially how regulation affected the macroeconomic value of the telecommunications industry. See Annex: General Remarks of the current roaming business.

3.1. Developments since the commencement of the Regulation

| Question 1: To what extent do you believe that the current regulation achieved its objectives in terms of: |
| (a) Contributing to the single market for roaming services? |
| (b) Ensuring consumer protection? |
| (c) Promoting competition? |
| Please explain and substantiate your responses with data where possible. |

(a) Single Market

By setting the wholesale and retail roaming prices for the different communications services in Europe the current regulation achieved an equal level of roaming charges in the European Member States. Due to this regulation every European citizen choosing the regulated tariff (“Eurotariff”) knows that he/she will be charged a certain price independent from the concrete Member State he/she is travelling to.

A functioning single market for electronic telecommunications services especially for roaming services neither means that differences between domestic and roaming charges have to be abolished nor that domestic price levels in the different Member States have to be equalised. The goal of a functioning internal market is defined in Article 26 (1) of the Treaty on the Functioning of the European Union as creating an area without internal frontiers in which the free movement of goods, persons, services and capital is ensured. But Article 27 of this treaty proves that a commitment for an internal market is not unlimited and national particularities of the Member States should be taken into account.

Therefore the Roaming Regulation (EC) No 544/2009 supports respecting national particularities in several passages. For example in recital 17 the European legislator admits that “Some operators face higher wholesale costs than others due to geographical or other circumstances, such as difficult topography, regions with low population density and large influxes of tourists within short time periods”.

Moreover the principle of proportionality for each European measure is adopted by recital 9, which states “(...) at the same time continuing to meet the dual objectives of eliminating excessive prices and allowing operators freedom to compete and innovate”.

A “total harmonisation” in order to achieve a certain vision of a single market would miss this target and would lead to a distortion of competition, which is to be avoided as stated in recital 8 of the Regulation: “Any obligation should not distort the competitive conditions between mobile operators within the Community and should not introduce any sort of competitive advantage, in particular on the basis of the size, type of roaming traffic or home market of the provider of roaming services.”
(b) Consumer protection

Following the BEREC Data reports and the Commission’s interim report the prices for voice calls made and received are now around 46 % and 55 % lower, respectively, than before the entry into force of the first Roaming Regulation (REGULATION (EC) No 717/2007). Consumers also benefit from new provisions on per-second billing. SMS prices have decreased by around 60 % on average and additionally, roaming customers do not have to pay for receiving voice mail messages while being abroad.

With regard to data roaming retail prices it can be recognized that these are following a downward trend as a significant reduction in wholesale prices to an average price which is now already below the level of the regulated cap took place. As several operators / operator groups are currently introducing new tariffs like usage passes and other innovative offers in order to establish a worry free data roaming experience for the consumers based on attractive prices (see also Section Deutsche Telekom’s way forward), data roaming retail prices are further decreasing significantly at 31% per year. Furthermore the implementation of Transparency measures and safeguard mechanisms – like the cut-off limit – have contributed to eliminating the ‘bill shock’ problem. European operators have undertaken substantial investments to implement the new transparency rules that have proved more technically challenging than had been expected.

In individual cases, for example with regard to MMS where customers already have full cost control as MMS traffic is charged by piece and not by data-volume or Prepaid-offers where customers can only use what they had topped-up before, the transparency measures are not necessary in order to achieve a customer protection and should be withdrawn with regard to these aspects.

As a result consumer protection already reached a very high level. As prices are expected to further decrease due to enhanced competition accompanied by more and more worry-free offers, the consumer protection situation is further improving.

(c) Competition

As a matter of fact, the price regulation especially of retail prices – a mandatory “Eurotariff” with an opt-out possibility – did not promote competition but lead to the situation that average Eurotariff retail Voice (and SMS) roaming rates remain at or fairly near the regulated caps in many Member States. Price caps combined with the mandated yearly price reductions have had the anticipated effect that most operators do not charge significantly below the regulated retail ceilings in connection with their Eurotariff offers. Operators, the GSM Association (GSMA) and many other parties have argued from the very beginning that regulation would harm the development of competitive and innovative roaming offers (roaming products and roaming pricing models) and would result in a lack of competition at retail level.

Although consumers have been – and still are – benefiting from lower roaming charges the massive regulatory driven retail price decreases for Voice and SMS have failed to produce a strong increase in usage of roaming services. The latest BEREC data report showed that voice roaming elasticity has been less than 0,5 since the introduction of regulation. As a result, operators roaming revenues have decreased significantly and thus regulation has impacted the industry severely.

However there are various alternative roaming tariffs available for Voice, SMS as well as for Data services. These alternative tariffs are in general and especially for calls received significantly lower than the
Eurotariff. Since the Regulation came into force several operators and operator groups have launched or are currently launching new and innovative roaming offers which are considerably cheaper than the price cap (see also Section Deutsche Telekom’s way forward). This evidence indicates that -with regard to these alternative tariffs- there is competition without regulatory intervention.

**Question 2:** Do you consider that regulatory intervention for roaming services is needed beyond June 2012? Please consider voice, SMS and data roaming services separately. In particular, if you consider that the Roaming Regulation should expire in June 2012, please explain why, and describe how you consider that the market for roaming services will evolve in the absence of regulation.

Over the years mobile operators have spent significant resources in order to meet the regulatory obligations. Implementing the roaming regulation has required major changes particularly to billing systems. Regulatory obligations have taken away resources from commercial initiatives and have had significant impact on domestic product roadmaps.

The various Roaming offers – alternative to the regulated *Eurotariffs* – prove that the roaming market already is a dynamic and competitive market (see also Deutsche Telekom’s response to Question 1). Especially with regard to the strongly emerging data roaming market, where customers also have a wide range of alternatives to choose from (W-LAN Hotspots, local SIM/dongles, etc.), we currently see a variety of new and innovative data roaming offers with very attractive prices per MB for European customers. As an increasing number of customers have smart phones and other devices which will generate growing data volumes, Deutsche Telekom believes that the roaming market itself is developing at a pace which will inevitably produce lower roaming prices especially with regard to data roaming.

The concern that without a continuation of regulatory price intervention for roaming services prices could increase after the expiry of the Regulation is without any reason. Expecting price increases ignores the market mechanism in the mobile industry which is mainly characterized by price decreases in the local markets due to well functioning competition. Statistics show that e.g. in Germany domestic prices for mobile communications services declined about 17.2% from 2005 to 2010\(^3\). Therefore it can be expected that roaming tariffs will continue to decrease below the 2011/2012 price ceilings. To assure that roaming prices would not be increased after the expiry of the Regulation, a trial “watch-period” could be installed in order to monitor declining prices even without regulation. As an additional safeguard the price caps of the last phase of the current regulation could be frozen and non-violation of these caps could further be reviewed by BEREC data collections.

Any extension of the Roaming Regulation as it is today would prolong the anti-competitive situation, limit operator’s financial capabilities to invest into new technologies and hinder the development of innovative roaming products and roaming pricing models.

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\(^3\) Source: Federal Office of Statistics in Germany.
3.2. **Options for future regulation**

3.2.1. **Maintain current approach**

**Question 3:** Do you consider that the current model of regulation would be effective in the future in light of the desired objectives? Will this approach ensure adequate consumer protection and help stimulate competition? Is it efficient and coherent with EU policies?

As already pointed out in the answers to the previous questions the current model of regulation does not promote competition but severely impacted the telecommunications industry and its contribution to the European economy.

Price regulation especially of retail prices lead to the situation that average Eurotariff retail Voice (and SMS) roaming rates remain at or fairly near the regulated caps in many Member States. And – as a matter of fact – the massive regulatory driven retail price decreases for voice and SMS have failed to produce a strong increase in usage of roaming services although consumers are benefiting from lower roaming charges.

Deutsche Telekom therefore does not consider the current model of regulation to be effective in the future in light of the desired objectives.

**Question 4:** If this model is suitable in principle, what modifications may be required in order to achieve a well functioning single market for roaming services? Should this approach be combined with other options?

The chosen retail regulation mechanism of a mandatory “Eurotariff” with an opt-out possibility for customers will further create focal price points and therefore is not suitable to promote competition.

If the Commission is to regulate prices, a much more reasonable approach would be either to cap the average price per unit (e.g., all voice retail roaming revenues divided by all voice roaming minutes on a per operator basis), or to cap the cost for a predefined tariff basket. The advantage of such an approach is that it will incentivise competition between operators, as it will allow operators to offer different prices to different customer segments according to their specific needs.

In order to prevent potential abuse, the approach could be coupled with a safeguard limit on unit price, which should be significantly higher than the regulated cap.

Any regulatory model should ensure that retail charges for roaming allow operators to compete by differentiating their offerings and adapting their pricing structures to market conditions and consumer preferences and demand.
3.2.2. Wholesale and transparency measures only

**Question 5:** Would regulation of wholesale prices charged to MNOs, combined with transparency measures, be effective, efficient and coherent in light of the single market objective? Would the benefits of regulated wholesale rates be passed through to consumers?

If only wholesale prices are regulated, then Deutsche Telekom expects that operators will demonstrate rational behaviour from a business perspective, which means that operators will make aggressive offers where the price elasticity is high and probably similar offers as today in segments with low elasticity. This behaviour is driven by the fierce competition of mobile operators on each of the individual (national) markets within Europe and a proof of functioning markets.

There is a risk associated with regulated wholesale rates if they decrease below a certain level. Due to a multitude of reasons (e.g., topology, country size or population distribution and density, license cost, network quality (3G, 4G), tax levels, labour cost levels), the cost to provide a (mobile) service (e.g. voice minutes) differs significantly by country, and is always linked to a significant and long term investment risk. Regulated wholesale roaming cost are identical to regulated wholesale access prices, and by definition these wholesale access prices are absolutely risk free for the buyer of such services. (Buyers do not share the infrastructure or licenses costs required to run the accessed network.) Providing buyers with access based on regulated wholesale rates below the production cost could give them the opportunity to generate profits at a level above those available to MNOs - the latter bearing all the risk of investments.

Deutsche Telekom believes that Transparency measures related to retail roaming services should be continued as they are useful to build customer confidence in not being subject to bill shocks.

3.2.3. Regulation of retail data roaming charges

**Question 6:** Do you consider that retail regulation of data roaming prices is necessary? If not, what are the likely market developments post-June 2012?

When it comes to the question whether retail regulation of data roaming offers is necessary several important aspects and challenges have to be considered:

a) Even the domestic mobile data market is still in its infancy and acting players are yet to find how best to serve their customers.

b) Data (roaming) services fundamentally differ from Voice or SMS (roaming) services.

c) There is a variety of new and innovative data roaming offers with very attractive prices per MB for European mobile subscribers.

Operators as well as customers are still on a learning curve to explore into what kind of data offer is most appropriate (price and data allowance) for that in the domestic as well as in the roaming use case. From an operator perspective tiered pricing offers for data are yet to come in order to meet different customer needs and use cases. Therefore, it would be totally the wrong signal to intervene in such an evolving market with retail price regulation. Especially as data (roaming) services fundamentally differ from voice or SMS (roaming) services. There is a wide range of very heterogeneous service categories and applications with an enormous spread of data volumes – from a few ten kilobytes to even hundreds of Megabytes (per day). Moreover customers’ willingness to pay per bit varies strongly between services (text messaging vs. video
streaming). Therefore some kind of “cross subsidies” are needed between different data services. Aggressive price caps on the price per MB would make this impossible. Crude linear per kilobyte charging models will either result in charging customers almost nothing or produce significant bills and thereby making large bandwidth services like video streaming virtually impossible.

Thus different service categories and applications should be able to be addressed accordingly. Mobile operators must have the flexibility to charge different data services differently to reflect the market value that customers place on different services.

Data roaming retail prices will continue to decrease significantly. The increasing availability of competitive and innovative tariffs in the market will further drive competition. We therefore recommend to maintaining customers sovereignty to decide on chosen tariffs.

Retail regulation for data roaming services would be damaging for competition as any regulatory intervention in this more and more competitive environment – especially taking into account increasing mobile data usage also abroad -would slow down operators’ current activities to launch new data roaming offers. In the light of competitive offers which are available and announced, the Commission should – at least for the next 2-3 years as a trial period – refrain from imposing retail regulation on data roaming services.

Question 7: If retail regulation of data roaming prices was necessary, what would be an appropriate model for such regulation?

As stated in Deutsche Telekom’s answer to Question 6, price cap regulation – especially if based on linear per kilobyte charging – damages competition and significantly limits the options for operators to drive usage through innovative offers. Therefore flexible pricing structures on retail level are required for data roaming.

If retail regulation is regarded necessary the introduction of a safeguard mechanism for average retail data roaming prices or for a pre-defined roaming tariff basket could be an option. This would allow significantly more flexibility and creativity on the retail side. Monitoring could be provided by recurring BEREC data collection. However such an approach would add new challenges as these controls tend to be complicated to operate, both for the operators and for regulators.

3.2.4. Approaches based on prices and conditions similar to those prevailing in the domestic markets

Question 8: Please indicate the advantages and disadvantages of these approaches [Roaming prices based on domestic prices in the home market or visited country], relative to each other and to the current model of price capping, considering also competition aspects such as the possibility of margin squeeze?

As a matter of fact domestic price levels in EU communications markets differ materially due to specific national preconditions. National price differences for mobile services result from several factors like cost structures, differences in network roll-out, network quality and differences in competition, availability of spectrum etc.. As these different conditions will persist, an approach based on domestic prices in the home market or visited country would be diametrically opposed to the principles of the EU internal market and fair competition.
It is stated in Recital 8 of the current Roaming Regulation that any obligations “should not distort the competitive conditions between mobile operators within the Community and should not introduce any sort of competitive advantage, in particular on the basis of the size, type of roaming traffic or home market of the provider of roaming services.”

Also BEREC realised the disadvantages of a closed alignment of roaming prices with domestic prices in its “Policy conclusions and recommendations” - Chapter of its Report on International Mobile Roaming Regulation 4:

“Very close alignment of roaming prices with domestic prices (whatever domestic price is chosen as a reference – i.e. home country, visited country or European average) will cause disruption to the market (...).”

It is very important to recognise that roaming usage & -services cannot be directly compared with domestic usage & -services. Therefore from that perspective it does not make any sense whatsoever to use domestic rates in the home or visited country as a reference for roaming prices. Whereas international connections are not comparable to national connections and connections to a fixed network are not comparable with connections to mobile networks, also roaming services and domestic services cannot easily be equated.

In particular it has to be considered that from the perspective of the visited Mobile Network Operator (MNO) roaming visitors are customers,

- who compared to national customers only cause small traffic volumes,
- who cause traffics with completely different profiles (e.g. 90 % of roaming calls are international calls – going back to a foreign, mostly the home destination of the visitor),
- who cause only very few on-net traffics,
- who do not make any recurring financial commitment to the visited MNO and therefore are charged only by usage – just like Prepaid customers.

To the contrary the national customers of an MNO are typically customers,

- who mainly generate national traffics with a significant amount of on-net connections,
- who in the most cases make a kind of recurring financial commitment to their operator (monthly fees, bundles or flat rates),
- who are using the network capacity more homogenously, with regard to the allocation of resources and without seasonal variability,
- who increasingly use quality-differentiated offers (e.g. already today not all tariffs make the maximum reachable bandwidth available).

This difference in usage patterns shows, that roaming follows other consumptive patterns, which demand suitable pricing schemes.

In addition, the provision of Roaming Services causes material complexity, which is absent from domestic services. There is a significant difference in structures between roaming and domestic services. While some of the roaming infrastructure is shared with domestic services (retail billing, customer acquisition and retention, radio network for visitors), other elements are specific to roaming: implementation, management and operations of an international signalling network and international call termination using international carrier services; maintenance of the “network” of roaming partners incl. ongoing commercial and technical negotiations, trouble shooting, fraud prevention; management and operations

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4 BEREC Report, Page 30 (Para 128)
of the roaming billing chain incl. relationships to clearing houses; targeted network expansion in areas with massive visitor concentration, roaming specific communications cost (e.g., billboard adds at all major airports) and dedicated roaming teams.

Roaming generates the same service like at home from the customer perspective (also known as the "Virtual Home Environment"), but instead of producing this service within the home network, the service needs to be provided by two networks, which operate highly complex interfaces. This structure is technology driven, irreversible and exists in addition to simple interconnection of networks.

Specifics of national market characteristics have to be considered

The European network operators face different challenges with respect to their served markets. There are operators, who serve customers in wide areas, some with customers in urban areas and others with customers in areas with strong geographical barriers (e.g. mountains). Domestic mobile markets obey different constraints and costs, for example, operators in domestic markets have often bought licenses to operate at great expense.

This factors influence an operators’ costs of production as it requires a different level of infrastructure to produce the same service. The cost per unit (e.g. per minute) goes up, if

- licence costs are high in a country,
- the population density is low (cost to connect rise respectively),
- the service quality is high (e.g. 3G or 4G networks),
- there are topographical barriers (mountains, hills, forests, etc...).

Addtl. important factors are

- significantly differing labour cost across Europe,
- differing corporate tax levels and Value Added Tax levels across Europe.

Due to the heterogeneous structure of the European countries, the European MNOs’ cost structures differ materially. The most extreme contrast can be drawn between small urban nations like Luxembourg and large countries with overall low population density (e.g. Poland).

The risks of standardizing the heterogeneous domestic price level across Europe

National market characteristics as explained above result in heterogeneous domestic price levels across Europe. Those domestic price levels differ significantly and are highly complex, with very different pre-paid and post-paid tariff structures and sometimes with large differences in tariffs between connections to other members of the same price plan (“on-plan”), connections to other customers on the same network (“on-net”) and off-net connections. Additionally many customers buy bundles of voice minutes plus SMS (and also data) – a situation which makes it impossible to identify a separate domestic voice tariff.

There is no indication that those price levels will converge due to different national market characteristics which will not disappear in the medium term.

Any regulatory approach to correlate retail roaming prices with domestic prices would cause price arbitrage opportunities between national markets and thereby cause strong negative economic effects: If roaming prices would be at a homogenous domestic level across Europe, each operator would be enabled to compete in all European telecommunications markets by selling its SIM cards in a roaming area to local customers for permanent daily use as a “domestic offer”.

This may appear favourable from a political point of view, but bears several problems:

The main cost driver for operators is the quality and size of the network. A high quality network is costly but brings a competitive advantage for the operator. If each operator may now use every network at the same cost, this would result in an imbalance of opportunities and risks. The “domestic” network operator faces the risk to recover his network investment; while the roaming operator has no material fixed costs
but may generate the same revenues. This strong imbalance between business opportunities and risks negatively impacts the stimuli to invest in network infrastructure outside urban areas.

Also BEREC realised the risks of an approach to correlate retail roaming prices with domestic prices: “For as long as domestic prices vary significantly across Europe, this regulatory option would create some scope for arbitrage opportunities. Web-based businesses could be expected to develop based on imports of SIMs from the countries with the best domestic deals.”

The model to specify Roaming prices based on visited country would increase complexity of roaming as customers would be faced with different prices in each Member State.

A homogenous price level for the EU (roaming = domestic) may appear favourable from a political point of view, but disregards several market, technical, commercial and competitive mechanisms and would undermine competition, investment and consumer interests by creating large-scale price arbitrage opportunities between national markets.

Deutsche Telekom therefore strongly recommends evaluating regulatory measures based on domestic prices not only from a political, but also from an economical and, competitive point of view. The Commission should not pursue these approaches any further.

3.2.5. **Separate sale of roaming services - decoupling of roaming from mobile services bundles**

**Question 9**: In general, would these decoupling approaches [Carrier Pre-select (CPS) in the domestic market or visited network or choose operator at the border (based on local retail price)] be effective in terms of stimulating greater competition for roaming services? Would all customer segments be able to benefit? Would such increased competition be sufficient to give consumers an effective choice of roaming services at (near) domestic prices?

Deutsche Telekom does not think that the described decoupling approaches would be effective in terms of stimulating greater competition for roaming services or bringing benefits to customer segments. The described approaches would make roaming a significantly more complex and less attractive service for customers and would also incur significant additional investment for a challenging time- and resource-consuming technical implementation on mobile network operators’ side.

(A) **Evaluation of the option Carrier Pre-select (CPS) in the domestic market / Unbundling EU-roaming services in the HOME country**

- **The customer experience with roaming offers from Network operators in the DOMESTIC market**

The solution would have to guarantee that customers can use their mobile phone number all the time, and that there are no restrictions in being accessible for terminating calls or terminating SMS while abroad. Secondly, there should not be any necessity to change the SIM-Card every time when going abroad.

- **The technical solution**

A concrete model/solution discussed would have to be based on the principle of the “double IMSI concept. In order to enjoy a seamless roaming service while being abroad, the precondition is that the customer changes at any point in time his/her old SIM-Card against a new "double IMSI" SIM-Card which

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1 BEREC Report, Page 112
not only includes the profile (IMSI, security keys, etc) of the domestic, but also the profile of the chosen provider for roaming services.

- **Implications of the technical solution on customer experience**
  - As the technical solution is based on the “double IMSI concept”, the customer has to change the old SIM-Card against a new one. Probably the customer would have to repeat this in case of a change of the roaming service provider;
  - Network selection will be more complex; the basic principle “Switch on your phone – and it works wherever you are!” probably doesn’t work at all;
  - Two contracts required; two accounts in case of prepaid;
  - Two invoices, two customer care interfaces.

(B) Evaluation of the option Carrier Pre-select (CPS) in the visited market / Unbundling of domestic and EU roaming services in the visited country (include: selection of an operator at the border)

- **The customer experience with roaming offers from Network operators in the VISITED market**
  - The user must select a visited network operator (probably in each country visited!) offering a local roaming tariff on top of the user’s standard contract with the Home operator.
    - It is questionable whether customers are willing to contract with an operator in another country for the provision of a local roaming offer (tariff).
    - Making tariff information available to users remains a challenge. Language issues and potentially a multitude of tariffs and options may be problematic with respect to achieving transparency for foreign users.
    - No transparency concerning coverage & technology (2G, 3G, 4G)

The proposed decoupling approaches are likely to negatively affect customer experience due to increased complexity incurred. Customers would need to be much more proactive with regards to their usage of mobile services abroad as the described approaches require significant more interaction from the customers than in nowadays where roaming is so simple. It can be doubted that consumers really appreciate and want such a decoupling of services.

Besides the negative effects for the consumer side operators will be disproportionately affected due to high implementation costs of necessary changes in systems. The implementation of a decoupling option would incur significant costs in terms of the infrastructure changes as well as sales and marketing costs. The total implementation cost is estimated at €250-€300m across Europe. As implementation costs for structural solutions are typically independent from an operator’s size, consequently smaller operators would suffer even more than larger operators.

Due to necessary changes to the systems – e.g. the introduction of a new HLR/HLR interface - any implementation would take a long time and would block resources which are needed for innovations which then have to be delayed.

For technical analysis of the decoupling approaches/options see answer to Question 10.

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6. A.T. Kearney Analysis on Operator Data for GSMA.
Question 10: Would such 'structural' approaches [Question 9] be efficient? What are the technical implementation issues associated with these approaches?

As already pointed out in the answer to Question 9 the structural decoupling approaches would disproportionately affect operators due to high implementation costs of necessary changes in systems and thereby block resources which are needed for innovations which then have to be delayed.

Also BEREC quite clearly pointed out in its report that those approaches require significant technical implementation efforts:

“Finally, this option [customer contracts with a different provider from the home country] appears to require a significant amount of technical development to enable customer registration, authentication and billing by the roaming provider. As this is not a standard procedure, significant implementation activities would be required, backed by standardisation. In addition, it is unclear how the current level of security could be maintained. It also adds considerable complexity to the commercial arrangements (in particular, three market players have a part in the provision of roaming services rather than the normal two), including three-way billing.”

Deutsche Telekom has undergone a detailed analysis with regard to the technical implementation issues of the different decoupling options. See Annex: Technical implementation issues associated with the Decoupling Options.

3.2.6. Spot-trading of wholesale roaming

Question 11: How feasible/efficient is the establishment of a spot trading market for wholesale roaming? Would this approach lead to competitive wholesale rates? How effective would this approach be in terms of achieving competitive retail rates?

Our understanding of a spot trading market for wholesale roaming is that operators offer e.g. inbound roaming minutes in their respective networks anonymously, so that all buyers only decide on price.

We are convinced that an approach to trade network capacity through a spot market is not feasible. The key reason is that roaming services are not a commodity. It is not possible to steer Voice different from SMS different from data, i.e. a customer can only register on one of the networks in the visited country and needs to use all services in that network.

In reality, services in different networks are quite different, e.g. with respect to coverage, available capacity in hotspots. In the area of data, this can be even more different – some operators offer just EDGE, others have 3G rolled out in metropolitan areas, others have invested significantly in a wide 3G roll-out. Typically, operators have not rolled out CAMEL to all networks in a country, which is a key prerequisite to offer prepaid roaming services.

In the theoretical case of a spot trading market, it would be pure luck whether a minute or a Megabyte is bought on a high-quality network or low investment / low quality network. Therefore, operators will not be able to achieve a certain quality level that is expected by its own customers and is a necessary part of the operator’s quality promise.

7 BEREC Report, Page 17 (Para 66)
Another aspect is that trading through spot markets will make volume-based discounts impossible, which deletes an important element that operators currently have at their disposal to reduce wholesale roaming cost.

It also remains open whether the market liquidity is large enough to enable reliable price finding mechanisms.

In summary, the effect of a wholesale spot trading market on retail rates is negative due to the very limited predictability of available wholesale prices. Operators putting retail offers on the market need predictability of the offered network capacity both in terms of wholesale cost as well as quality for as long as the retail offer is on the market. If this predictability is not given, operators will need to work with significant safety margins between retail price and wholesale cost, which will not lead to more attractive retail prices. Furthermore minutes during peak times like the summer holiday season might be significantly more expensive than today.

3.2.7. Access-based approaches

<table>
<thead>
<tr>
<th>Question 12: For each of options (i) to (iii) below please indicate whether such approaches can stimulate additional competition for roaming services. In order to achieve significant reductions in roaming prices do you consider that these 'access-based' approaches may need to be combined with other forms of wholesale price regulation (i.e. between MNOs) and/or retail price regulation? Please explain.</th>
</tr>
</thead>
<tbody>
<tr>
<td>(i) Wholesale access could be mandated for MVNOs, for roaming only, in visited networks</td>
</tr>
<tr>
<td>(ii) the charge levied by MNOs to MVNOs using their networks in the home market could be capped at the level of the maximum wholesale cap; this approach could also be combined with (i) above</td>
</tr>
<tr>
<td>(iii) mandating full wholesale access for MVNOs to mobile networks in the home market for all services (not just roaming)</td>
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**General considerations**

The described access-based approaches would impose an obligation upon operators to provide access to third parties on their networks. Such an obligation would imply a material increase of regulatory intensity compared to current wholesale price regulation for roaming services.

The European regulatory framework for electronic communications services describes a detailed procedure as justification for the imposition of access obligations to telecommunications networks. This procedure e.g. includes the finding of significant market power and the test of suitable and proportionate regulatory remedies.

Imposing one out of the described access-based approaches without considering the above mentioned preconditions for regulatory access obligations would be disproportionate and contradictory with regard to sector-specific regulatory practice in Europe.
(i) Wholesale access could be mandated for MVNOs, for roaming only, in visited networks

“True MVNOs” – with own HLRs and own IMSI ranges – can negotiate roaming agreements and discount agreements with operators in a visited country already today. However, such deals are not common today.

If wholesale access would be price-regulated such an access-based regime would be inconsistent with existing principles of the regulatory framework (s. above).

It should be noted that BEREC is of the opinion that market entry only for the provision of roaming services would not be practical as the acquisition of customers only for roaming services would not be commercially viable.8

(ii) The charge levied by MNOs to MVNOs using their networks in the home market could be capped at the level of the maximum wholesale cap

Regulation to provide MVNOs with access based on capped wholesale prices could provide MVNOs with opportunities to generate profits at a level above those available to mobile operators as – inter alia – MVNOs do not share the infrastructure or licenses costs. This is likely to discourage investment. If combined with model (i), the above comments apply.

(iii) Mandating full wholesale access for MVNOs to mobile networks in the home market for all services (not just roaming)

This proposal significantly goes beyond the current discussion topic of roaming.

On the one hand, even the Commission acknowledges the existence of fierce competition on the domestic mobile markets within the EU. Forcing operators to offer mandatory wholesale access at regulated rates is an unnecessary and dangerous intervention into functioning markets. Depending on the level of the regulated rate (and here the question is how the rate is set) there is a significant risk of destroying any incentives to invest in a country if the regulated domestic wholesale rate is too low.

On the other hand, such regulated domestic MVNO access would not help to achieve the Commissions targets, as each MVNO would need to negotiate and implement domestic MVNO deals in every country (a project typically lasting several months). In addition, a pan-European MVNO would end up with domestic number ranges of all those countries where it has negotiated MVNO deals. Special, non-standard handsets would be needed to manage the multitude of national IMSIs, and extra effort needs to be invested to implement call forwarding between the different identities. Therefore, it is unlikely that such a pan-European MVNO would trigger a significant downward movement on roaming prices. Players with a similar business model like “truphone” have not been very successful and have chosen to operate only in narrow customer segments.

From a technical perspective, this model would require that domestic MVNO models (and technical and administration interfaces) are completely standardized, which is not at all the case today. Today, MVNO models differ significantly (e.g. MVNO with or without own HLR and SIM cards, individual allocation of core network components either at the supporting mobile operator or at the MVNO) – a situation which makes the implementation of domestic MVNO models very costly and time-intensive. If the objective was to standardize the MVNO business, cost for adaptations of the V-MNO’s technical landscape would differ

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8 BEREC Report, Page 117
significantly, but would on average be very high. Without standardization, MVNO’s would have to bear the costs for different technical scenarios in different countries.

As a result this option should not be pursued any further.

4. **Medium to long term view**

| Question 13: In the medium to long term, markets and technologies will possibly evolve to the point where roaming services can be provided by different competing technologies [e.g. WiFi and IP data networks]. Such developments seem to be unlikely to be sufficient to eliminate or minimize roaming problems within 5 years. Do respondents share this view? Please explain. |

WiFi networks are already available today, and although no detailed figures are available, quite a few heavy travellers are using several applications via WiFi to substitute Voice roaming. More and more hotels are even offering WiFi services included in the room price, i.e. virtually for free. The downside of WiFi is its limited coverage as well as the more complex user experience, which is, however, reduced by modern smartphones and easy to use applications (apps).

High-speed mobile data networks (like networks based on LTE) will certainly increase the pressure on roaming retail prices as VoIP services will work better over these networks. However, it must be taken into account that technology investment decisions for operators are long term decisions. So even if LTE would offer a more attractive cost base, the depreciation of legacy technology and license cost will ensure that the blended cost base for operators across all implemented technologies is not comparable to the cost base for operators and service providers offering VoIP free of charge.

Derived from experiences from the past, data network roll-out based on LTE as well as the wide penetration of corresponding handsets will take significant time, and can therefore not be considered as a short term solution within the next 5 years.

Otherwise, the purchase of a local SIM card in the visited country is still a viable alternative, especially for data centric devices.

| Question 14: Do respondents think that the Commission should pursue measures to accelerate these developments (e.g. to encourage the massive deployment of interconnected WiFi networks? What other measures could be considered? What will the impact be of the transition to an ‘all IP’ environment on roaming services? |

**WiFi:** a widespread roll-out of WiFi based on the available frequencies is not efficient, which is proven by the fact that no player has entered this space on a big scale. Forcing operators by means of regulation to deploy WiFi corresponds to an irresponsible destruction of value.

**LTE:** Expected regulatory interventions are a large disincentive for operators to invest into LTE roll-out. Regulators and the Commission would speed up the roll-out of LTE by providing investors with a stable and predictable environment allowing them to receive a premium for the long term investment risk they are entering.
Overall, the availability of high-speed mobile data networks will increase competition also in the Voice space, as new players from outside the established telecommunications industry will enter with VoIP offers based on best effort data connectivity. It must be noted, though, that networks will only offer sufficient quality for VoIP offers if network owners can have viable business models enabling them to continuously invest into their networks. If this investment is not done, the explosive growth of (mobile) data volumes will congest networks sooner or later and make streaming services like VoIP infeasible during peak times and at locations with high traffic demand.

5. Specific Issues

5.1. Inadverent roaming at border regions

**Question 15:** To what extent is the problem of inadvertent roaming still a concern for citizen's living close to borders? What measures could be taken to avoid the adverse effects of inadvertent roaming, whether by means of voluntary co-operation between operators or by means of regulatory or legislative action?

There is no need for regulatory or legislative action as operators are dealing with the issue of inadvertent roaming – see answer to Question 16.

**Question 16:** If you are an operator, what measures (technical or otherwise) have you taken to deal with the issue of inadvertent roaming, both to prevent it happening and to compensate for the adverse effects once it has been shown to have occurred? How do you raise awareness of the problem and the potential remedies on the part of your customers?

General considerations:
1. According to the provisions of Article 6 of the Regulation a customer, whenever being registered on a foreign network, will receive a “Welcome SMS” (“Push SMS”) sent by the Home operator. Based on this message and based on the additional information about the “roaming symbol” given on the handset display, a customer is aware that he/she is served by a foreign network.
2. It is state of the art technology that mobile operators monitor the antennas’ signal strengths of foreign networks in the border regions. If signals in a certain area are deemed to be too strong, the monitoring operator will request from the other party the adjustment of the antennas’ signal strengths according to the standards.

Additional measures:
1. Deutsche Telekom’s national operations have established processes to react to customer complaints due to inadvertent roaming. [CONFIDENTIAL]
2. Customers frequently travelling in boarder areas are advised by Customer Care to change the handset’s network selection setting from automatic to manual network selection. In some cases customers are advised to disable roaming.
3. Deutsche Telekom is currently implementing an online SMS notification which will inform the customer about the amount of accumulated roaming charges – this gives an indication on inadvertent roaming.

4. Some of Deutsche Telekom’s national operations have already implemented a “warning mechanism” in case the customer is going to register onto a foreign mobile network. Registration will only take place following an explicit “go” from the customer.

5. As Data roaming only works following an explicit purchase order from the customer there is no risk of inadvertent data roaming.

6. [CONFIDENTIAL]

5.2. **Outermost regions**

**Question 17:** What has been the impact on mobile users and service providers of the implementation of the Regulation as far as roaming within, from or between the outermost regions is concerned?

We are not aware of any incorrect implementation as far as roaming within, from or between the outermost regions as operators in those regions have implemented the Roaming Regulation like the other operators in Europe did.

**Question 18:** What additional measures (if any) have been taken by the Member States or their NRAs to address roaming between the outermost regions and other parts of the EU?

Following the correct implementation as far as roaming within, from or between the outermost regions (see answer given to Question 17), we are not aware of any additional measures to address roaming between the outermost regions and other parts of the EU.

5.3. **Impact on smaller operators**

**Question 19:** What has been the financial impact (revenues, costs, profits, volumes etc.) on smaller mobile telephony providers of the application of the Regulation since its entry into force on 30 June 2007 and amended in 2009? Please provide financial data and any other information in this respect wherever possible (which will be treated as confidential if so requested).

According to BEREC smaller operators have benefited from the provisions of the regulation through decreasing wholesale costs for non-group voice minutes by over 50% since Q2/2007, whilst retail prices have fallen by less than 50% in the same period.

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9 Source: BEREC Benchmark Data Report for January 2010 – June 2010; Fig 12 (EU/EEA average price per minute for wholesale non-group voice calls): http://www.erg.eu.int/doc/berec/bor_10_50.pdf
**Question 20**: Has any operator encountered problems when seeking to agree a wholesale roaming agreement with an operator in another Member State? What kind of problems were these (e.g. for SMS interworking)? Were they resolved in the end? Was the issue referred to an NRA? If so, what action has been taken or is in train to address those problems?

Deutsche Telekom’s national operations have not encountered problems in signing wholesale agreements on roaming with an operator in another Member State. If operators (or MVNOs) would face such problems they may always agree to connect via hubs (“Roaming Broker”), so there is always the possibility of connectivity.

Deutsche Telekom is generally open to launch roaming relationships (including wholesale agreements) with any operator. In the EU27 Member States, the situation is that (with only few exceptions) Deutsche Telekom operators have launched roaming relationships with almost all other operators.

### 5.4. Traffic steering

**Question 21**: To what extent is the use of traffic steering accompanied by a lower retail price for the roaming customer? Where lower roaming prices are conditional upon the use of a preferred visited network, how effective is the traffic steering in practice in ensuring that the preferred network is used? Please provide detailed data where possible.

Furthermore, traffic steering also helps to optimize the service quality. The Quality of Service issue becomes important for data services since not all roaming partners do offer 3G and/or HSPA, i.e. steering customers onto networks offering those services provides the customers with a significantly improved service experience.

The effectiveness of traffic steering depends very much on the methods used for steering, the quality of the receiving network as well as the number of networks in the receiving country. In general, Deutsche Telekom operators can steer up to [CONFIDENTIAL]% of their traffic into the preferred network (depending on the relative coverage of the receiving operators.

Deutsche Telekom’s standard roaming tariff follows a “zonal concept” without network differentiation. In this respect the customer does not suffer commercially from traffic steering decisions taken by Deutsche Telekom. The benefits derived from steering traffic to operators which have reduced their wholesale rates are passed onto the customers irrespective of the network they are using.

In addition, it is Deutsche Telekom’s policy to let customers override the operator’s traffic steering choice by means of manual network selection. See answer to Question 22.
Question 22: What techniques are applied to implement traffic steering in practice? Is the roaming customer informed in advance about the steering and does he have the possibility to override it?

Deutsche Telekom's network operators apply state of the art traffic steering measures like dynamic updates of preferred partner lists on SIM cards over the air and signalling based traffic steering. Both measures can be configured dependent on the customer’s tariff scheme.

a) Traffic steering via the „Preferred Partner“-List (PP-list) on the SIM
   This method is used since the early times of roaming. It was optimized in a way that the PP-list on the SIM can be updated “over the air” if a customers moves from one country to another. The PP-list can be specific to both, the country the customer is roaming in, and to the applicable tariff scheme.

b) Additional measures to enhance efficiency of traffic steering based on Preferred Partner Network Lists
   The GSM-Standard Release 99 introduced the so-called „periodic scan for preferred network“. Handsets compliant to this standard periodically scan whether there is a network with a higher ranking on the PP-list available. This further increases the efficiency of PP-list based traffic steering. Most of the handsets currently sold are release 99 compliant, although there are still quite a few older handsets in the installed base.
   [CONFIDENTIAL]

c) [CONFIDENTIAL]

d) Signaling-based Traffic Steering
   Signaling-based traffic steering is an approach which modifies signaling between networks in the case that the visited network is a non-preferred one. This leads to a further improved traffic steering efficiency.

e) Traffic Steering for pre-paid customers
   In order to allow pre-paid customers a convenient means of usage of roaming service the visited network needs to offer some technical features, i.e. the so-called CAMEL-logic. This leads to an indirect traffic steering effect if this logic is not supported by all networks in a foreign country.

Deutsche Telekom is able to apply the traffic steering measures dependent on the tariff scheme of the respective SIM card.

The customer does not receive special information on traffic steering, but can usually see the name of the current network in the handset display. It is Deutsche Telekom’s policy that the customer always has the possibility to select a network manually and thereby overriding the traffic steering default. (This manual network selection is also used in order to deal with the issue of inadvertent roaming. See answer to Question 16.)

Information on how to override the operator’s preferred partner network list (through “manual network selection”) is provided (a) via roaming brochures and (b) through additional documentation explaining how to register on foreign networks based on customer preferences. Handset specific information on manual network selection is provided by handset manufacturers in their user manuals.
As already mentioned above there is – due to Deutsche Telekom’s retail policy following a “zonal concept” without network differentiation – generally no price difference between the networks in a country, therefore the customer does not derive any financial benefit from selecting the network manually.

5.5. Impact on domestic prices

Question 23: Have you identified any significant effects on domestic prices or changes in an operator's tariff structure for domestic voice calls or other mobile services introduced after or shortly before the entry into force of the Regulation? If so, please explain providing details of the changes in terms of timing, scope and prices.

Retail prices in the mobile industry have been (and are) continuously declining. In order to meet expectations of the global capital markets, operators have to deliver an expected return on capital and cash flows. For details see Section “Annex: General Remarks of the current roaming business”.

For sure operators of telecommunications services have to compensate value destruction caused by regulatory interventions through other areas, and a typical reaction is that planned price measures in the domestic business are delayed or cancelled completely. This effect is difficult to show due to the general decline of price points (“hidden waterbed effect”).

This means that the frequently mentioned claim of the Commission that roaming regulation will protect consumer interests is incorrect, also in light of the fact that only a minority of customers actually uses roaming services.

5.6. Impact on international roaming arrangements with operators in third countries

Question 24: What, if any, has been the impact of the Regulation on reciprocal roaming arrangements between EU/EEA mobile operators and their counterparts in other third countries?

We are not aware of any impact of the Regulation on roaming arrangements between EU/EEA operators and their counterparts in other third countries considering roaming arrangements are of solely bilateral nature and commercial terms are negotiated taking into account the specific situation (traffic volume, service availability etc.) between those parties. The results of these negotiations depend on the willingness of the third country’s operators to agree upon attractive discounts. In case of low commercial attractiveness the operators may agree to connect via hubs (“Roaming Broker”).

Question 25: Have any Community-based providers of mobile roaming services negotiated agreements with third country operators concerning a reduction of wholesale roaming tariffs comparable to those set up in the Regulation?

EU/EEA operators are negotiating agreements with third country operators concerning a reduction of wholesale roaming tariffs in the same way as within the Community. However, those negotiations are independent of the wholesale charges specified by the Roaming Regulation due to the bilateral nature of those roaming arrangements as explained in the answer given to Question 24. [CONFIDENTIAL]
6. Annex: Technical implementation issues associated with the Decoupling Options

Technical implementation issues associated with the option Carrier Pre-select (CPS) in the DOMESTIC market

This model would be based on the principle of a “double IMSI solution”. In order to enjoy a relatively seamless roaming service while being abroad, the precondition is that the customer makes a logical swap between his home provider’s SIM profile and his roaming provider’s SIM profile. Both profiles include separate IMSI’s, security keys and other relevant data. Despite the relatively easy idea at first glance, the technical implementation comes with high technical complexity and an excessive list of open technical issues – especially the introduction of a new HLR/HLR interface – which needs at least 24 months for implementation, involves very high not yet specifiable implementation cost and requires changing the global GSM standard for EU customers. It should be noted that only are approx. 350 million European out of more than 4,810 billion GSM customers worldwide would require such changes. It is unlikely, that standards can be changed and equipment vendors follow soon for appropriate prices.

Necessary preconditions of the technical solution which will allow for a relatively seamless roaming service while being abroad.

- Routing of roaming MT calls
  As the complexity is particularly related to the roaming MT scenario – and not to roaming MO calls and SMS traffic – the technical considerations on necessary preconditions presented here apply to the routing of MT Voice calls.

Receiving a call:
If a customer is being called, the call will be routed to the network to which the number belongs to. As the number belongs to the provider for national phone services the sending network will route the call to this network. Therefore, if the called party is not in his home network but registered in a visited network the customer’s network for national phone services would not be able to route the call to the called party.
In order to facilitate that customers with a different provider for roaming than for national services cannot just make but also receive calls an additional interface between the relevant databases (HLR – Home Location Register) of the provider for roaming services and the provider for national services has to be established. However, the communication and exchange of messages between different operators’ HLR’s is not specified (and therefore not established). Hence, additional communication links (and communication parameters) have to be specified and standardised on an international level before the unbundling principle could be realised.

- Figure 1 below presents an overview on the technical platform necessary to guarantee that the customer enjoys a seamless roaming service while receiving a call being abroad using the “double IMSI concept”:

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10 Source: GSMA – indicative figure only, estimated from market data collected by Wireless Intelligence
Some more challenges from a technical point of view:

- Modification of the MAP protocol required through international standardization bodies. Those changes to the standard cannot solely be agreed upon on a European level but require to be agreed on a worldwide basis as vendors supply a worldwide mobile communications market.
- A completely new, still to be standardized and secure provisioning chain for foreign SIM profiles would have to be established between home MNO’s, roaming providers and SIM manufacturers.
- In case of roaming, the Short Message Service Centre (SMSC) of the Roaming Provider has to be used. An update of user profiles in the handsets would be necessary. More clarification on the interoperability of different SMSC’s would be required.
- A commercial framework for the forwarding of SMS and MMS messages from the home MNO to the roaming service provider would have to be developed.
- Commercial synchronization between Roaming Provider and Domestic Provider to be implemented in order to allow correct accounting between all parties involved.
- Blocking of usage of the Roaming Provider’s services in the Home market has to be implemented.
- Review of traffic steering algorithms currently used by operators to provide “best in class roaming services” and to support commercial arrangements with partners necessary – changes to those traffic steering algorithms to be implemented once agreed.
- Review of the so-called “Preferred PMN-mechanism” necessary – changes to be implemented once agreed.
- Mechanism of how the handset will register in the visiting network using the IMSI and network security key of the roaming provider to be analyzed in detail. This mechanism also depends on
the properties of the handsets with different vendors having implemented different selection and registration algorithms.

- Significant problems are expected with the handling and sharing of (sensitive) customer information between competitors.
- Significant problems are expected with services offered by home networks, such as BlackBerry, E-Mail, portals, VPN’s etc. Especially the data access while being abroad adds even more complexity as data access is “per default” is routed through the Home provider’s network (see Figure 2 below):

In addition, inter-operator accounting and billing schemes (see Figure 2) would have to be extended to cover both the old regime and the new option in parallel. Significant changes would have to be made to retail and wholesale billing systems. Beyond the fact that international standardization is required for this, the necessary implementation measures in operators’ billing systems would come with high costs and have a significant impact on domestic product roadmaps.

Technical implementation issues associated with the option Carrier Pre-select (CPS) in the VISITED country

The result of this solution will be a stripped down product with very basic functions missing. Significant problems are expected with services offered by home networks, such as BlackBerry, E-Mail, portals, VPN’s etc. MMS transmission and reception on the home number would not work at all as some
operators use the same APN for both internet traffic and MMS with the home network distinguishing between public Internet and home service traffic.

Modifications of the MAP protocol (and probably TAP protocol) required through international standardization bodies in order to reflect the new "charging characteristics" / billing regime. Major changes to the operators’ rating and billing systems required.

Limitations concerning data, SMS and MMS retail prices: As the home network operator incurs interconnection fees for outgoing data and message traffic, Visited Network operators are not able to offer all-inclusive prices. Their retail offers can relate only to air time. In addition, end customers will be charged their domestic service rates.

Similar issues with inter-operator accounting and billing schemes as well as with the handling and sharing of (sensitive) customer information between competitors as stated for option Carrier Pre-select (CPS) in the DOMESTIC market.

**Technical implementation issues associated with the option Choose operator at the border (based on local retail price)**

This model inherits most of the restrictions of the above one. The result of this solution will also be a stripped down product with very basic functions missing. Significant problems are expected with services offered by home networks, such as BlackBerry, E-Mail, portals, VPN’s etc. MMS transmission and reception on the home number would not work at all as some operators use the same APN for both internet traffic and MMS with the home network distinguishing between public Internet and home service traffic.

Similar issues with inter-operator accounting and billing schemes as stated for option Carrier Pre-select (CPS) in the DOMESTIC market.
7. Annex: General Remarks of the current roaming business

7.1. Industrial considerations

7.1.1. Financial shape of the industry provides no evidence for insufficient competition

European telecommunications industry is blamed to apply high charges for provided services and to be inefficient. Looking at financial facts for four tier1 European operators (see Figure below), we can see that there is declining profitability, lower free cash flow and rising debt, while investment risk (capital) is constant. There are no excessive profits, which would indicate that there are inefficient markets. This worsening financial shape of the industry stays in conflict with speedy innovation cycles and high demand products and is to a material extend caused by price regulation.

![Graph showing profitability, free cash flow, indebtedness, and invested capital for four European operators over years 2004 to 2009.]

- Profitability has fallen by ~60%
- Free Cash Flow has fallen by 55%
- Indebtedness has risen by 45 bn (30%) in 5 years
- Invested capital is constantly high (~500 bn EUR)

7.1.2. Macroeconomic value of the telecommunications industry harmed by regulation

A tough price regulation directly impacts the economic contribution of the telecommunications industry to the European economy:

- The lower income of the telecommunications industry directly impacts Gross Domestic Product (GDP). The GDP delta from 2006 - 2009 has been minus 1.4 bn EUR. Assumed impact from planned regulatory measures from 2010 - 2015 are additional 5.3 bn EUR (see Figure below).

That means that regulation cuts valuable economic production in the telecommunications business, while at the same time the European Commission and national governments spend billions of EUR to

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11 Source: ATKearny (ATK) data collection on Intra European Roaming Services
12 Scenario calculation based on ATK industry information. Scenario calculation takes into account increasing Data roaming traffic and further declining price caps for Voice, SMS and Data
accelerate economic growth by transfer payments to various industries in the context of the financial crisis.

− Due to falling profits, tax payments of the telecommunications industry will be reduced by approx. 2.4 bn EUR p.a.\(^\text{13}\) from 2010 – 2015 following a reduction of 630 mio EUR from 2006 – 2009 (see Figure below).

Besides those direct impacts there are several indirect impacts likely to occur.

− As cash flow expectations of the industry are lowered there is a reduced incentive to invest. Lower investment result in lowered quality of telecommunications infrastructure. This is an industry wide phenomenon, which will also affect several technologies outside the roaming discussion. Lower infrastructure investments negatively affect quality and therefore limit economic growth, as information technology is a crucial backbone for modern economies.

− There are also secondary effects in the overall demand of the economy, as government will be forced to cut spendings as they have less tax income, laid off people will have reduced consumption and other suppliers of the telecommunications industry will be affected by lower demand for investments and services.

The telecommunications industry is considered to be of fundamental importance for modern economies. Recent European statistics prove that the telecommunications industry is facing an overall massive price decline compared to other industries (see Figure below). Several cost components are fixed within a network (e.g. licences, core network and radio equipment, etc.) which are depreciated. Other sourcing components become more expensive in line with overall inflation (energy, payroll, rents, ...). This inflation spread (minus on revenues vs plus on costs) puts material pressure on operators’ financials.

On the other hand regulators and the EU Commission would speed up the roll-out of LTE by providing investors with a stable and predictable environment allowing them to receive a premium for the long term investment risk. But the multitude of current interventions both from national regulators and the EU Commission is going to avoid a widespread implementation of high speed mobile networks. It is very likely that (apart from certain license obligations in the 800MHz band) LTE roll-out will be limited mainly to metropolitan areas – and therefore reduces the attractiveness of LTE in terms of area coverage.

\^\text{13}\) Tax impact has been assessed to be 45% of GDP impact (20% VAT and 25% profit tax)
7.1.3. **Regulatory cycles are 2-3 years, and are way to short for the 10-15 year business**

The electronic telecommunications business is characterised by investments in and the operation of communication networks – a business requiring high investments which amortize only in the long run. Comparing the payback period and the technological aging speed with current regulation practice, Deutsche Telekom is of the opinion that regulatory pressure is focusing on short term impacts, disregarding the long term business cycles of the industry (see Figure below).

![Diagram: Regulation horizon is materially shorter than business cycles](image)

**Figure 1.24: HICP main headings, annual average inflation rates, EU, 2008 (%)**

Source: Eurostat [pc_hicp_allin]

7.2. **Roaming specific considerations**

Discussing Roaming and comparing it to national telecommunications products or services demands an understanding about the production of the roaming service. Roaming is more complex as two networks from different countries are involved and several dedicated interfaces and additional service functions are required (see Figure below). Such infrastructure is to be implemented and operated in addition to an existing “national” network and such additional complexity needs to be recovered via dedicated roaming revenues. In addition to that it is very important to recognise that roaming usage and domestic usage cannot be compared directly (for details see answer to Question 8). Consequently Roaming services need to be higher priced than national (domestic) services.
Roaming is complex and causes specific complexity:

- dedicated billing and tariff schemes
- dedicated staff & management teams (set up and run infrastructure)
- carrier lines and core net investments

**Scope of Roaming calls in comparison to national on net telephony**

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<thead>
<tr>
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<th>Network B</th>
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The necessary additional infrastructure has to be provided based on capacity requirements derived from customers' usage peaks. The generated revenue is paid only on usage and therefore average usage. Due to the seasonality of usage – which is a characteristic of the roaming business, see Figure below –, the average is approx. 25% below the peak, triggering costs for unused capacity, which need to be recovered as well.

**Usage pattern of intra European Voice Roaming**

- **usage peak = capacity = cost driver**
- **Ø usage = revenue driver**

Most cost positions are network/capacity related and fixed.

Ø revenue usage base is approx. 25% below cost base.

Retail prices need to recover empty capacity in low season.