

Falch, Morten

**Conference Paper**

## Regulation of international roaming data services within the EU

23rd European Regional Conference of the International Telecommunications Society (ITS), Vienna, Austria, 1st-4th July, 2012

**Provided in Cooperation with:**

International Telecommunications Society (ITS)

*Suggested Citation:* Falch, Morten (2012) : Regulation of international roaming data services within the EU, 23rd European Regional Conference of the International Telecommunications Society (ITS), Vienna, Austria, 1st-4th July, 2012, International Telecommunications Society (ITS), Calgary

This Version is available at:

<https://hdl.handle.net/10419/60370>

**Standard-Nutzungsbedingungen:**

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

**Terms of use:**

*Documents in EconStor may be saved and copied for your personal and scholarly purposes.*

*You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.*

*If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.*

# Regulation of international roaming data services within the EU

Morten Falch  
Center for Communication, Media and Information technologies  
Aalborg University Copenhagen

## Introduction

International roaming is a regulatory issue of particular interest as it goes beyond national borders and regulation was been widely debated for almost a decade before its implementation. A new EU legislation on international roaming was adopted in March 2012. The new legislation has extended and expanded the previous framework, which was scheduled to terminate in July 2012.

The roaming regulation differs from other telecom regulation, as the regulation covers the entire EU market, without any considerations to national differences in levels of competition and pricing structures.

Regulation of international roaming is more complicated than regulation of other telecom services. The market structures on mobile markets are different from the markets for fixed services dominated by the former national monopolies. The issue is therefore not to strengthen competition by creation of a fair level playing field for new entrants, but to prevent excessive profits on roaming services on a market, where competition works for other kinds of services. Furthermore, regulation of international roaming is difficult to implement at the national level as operators from more than one country are involved.

Data services will increase in importance relative to voice services, and with the development of new mobile technologies such as LTE, it will become less relevant to distinguish between voice and data services.

This paper will discuss the new legislation in view of recent market developments from a technological, economic and a regulatory perspective. The paper will review the model applied for regulation of international roaming within the EU and discuss whether this will be a step towards a more harmonized regulation at the EU level or whether international roaming provides a special case without any implications for regulation in other areas. Moreover it will be discussed whether regulation in combination with technological developments will facilitate development of real competition, and renewal of the roaming regulation therefore may be unnecessary. The paper focuses on the regulation of international roaming of data services, as this part of the regulation is still under development.

## International Roaming Regulation within EU

A common framework for regulation was not adopted at EU level before 2007 – almost a decade after the full liberalization of telecom markets. This is not because a recent developed regulatory need. Complaints about excessive rates for international roaming started already back in 1999 and since then issue have been taken up several times (Falch, Henten, & Tadayoni, 2009; Sutherland, 2008).

International roaming was defined as a separate market in the market definitions applied in the EU regulatory framework, but the implementation of the new telecom regulation package has not led to any intervention on this market at national level. Market studies for this particular market were among the last to be implemented. In August 2006 most countries had completed market studies for other telecom services than international roaming (Falch et al., 2009). Only Finland had made a decision on international roaming; here the conclusion was that the market was competitive.

This conclusion was later followed by market studies in other EU countries. In spite of this an impact study prepared for the Commission in 2006 showed that international roaming charges were 3-5 times higher than the costs (CEC, 2006). Thus it became clear that additional regulatory measures would be necessary, if competition was unable to force down the excessive roaming rates.

The legislation adopted in 2007 introduced price caps in both retail and wholesale markets for international roaming. The major argument for such heavy-handed regulation was that international roaming prices were much higher than cost-based prices, and that roaming charges represented a major barrier towards growth in international mobile communication within the EU.<sup>1</sup>

An interesting aspect of the proposal from the Commission is the use of a European home-market approach, which implies use of common price caps for all EU member states. This implies that determination of price caps are moved from national to European level. This may therefore be seen as a step towards decreasing the power of national telecom authorities and strengthening regulation at EU level. A common price cap improves transparency for consumers, but it may create a situation where operators in high cost countries may have difficulties in covering their costs in full. It may also create strange pricing schemes, where international roaming becomes cheaper than national roaming.

Both wholesale charges and retail charges have been subject to intensive debate. From the beginning operators were very much against any form of regulation, in particular at the retail level. In spite of ample documentation proving excessive rates without any relationship to costs, it was claimed that there is effective competition on the international roaming market. Also some Governments have been very reluctant towards regulation. In particular in tourist destinations in Southern Europe, international roaming has proved to be an important source of income.

The EU intervention was a compromise between those asking for cost based roaming charges and the interests of operators – particular those operating in major tourist destinations. Nevertheless seen from the consumers' point of view, it was a considerable improvement compared to the former situation as retail

---

<sup>1</sup> Documented by Special Eurobarometer on Roaming published March 2007  
[http://ec.europa.eu/information\\_society/newsroom/cf/document.cfm?action=display&doc\\_id=250](http://ec.europa.eu/information_society/newsroom/cf/document.cfm?action=display&doc_id=250)

charges were reduced by more than 50%. Moreover, it was implemented with an impressive speed (less than one year after the proposal from the Commission was published). It is also a move away from regulation based on more or less objective economic evidence towards regulation based on political negotiations between parties with conflicting interests.

The price caps were introduced for three years only and decreased over time. It was decided to review the outcome of the regulation in 2010, and then decide whether price regulation on both retail and wholesale markets was to be maintained, or if competition had developed in a way, which made further regulation superfluous.

In 2010 the Commission concluded that “there are not sufficient competitive dynamics in the structure of roaming services”<sup>2</sup>. Based on this new price caps were created for two more years (until 2012). In 2012 further reductions were agreed. This time the regulation was extended until 2022<sup>3</sup>.

Telecom markets have indeed become gradually more competitive since the liberalization process began in the mid 90's. In particular in markets for mobile services real competition has developed. As a consequence of this regulation in particular on retail markets has been relaxed and more light-handed remedies is preferred. The question is whether the market for international roaming services inhibits certain characteristics that make it different from any other market, or if the competitive problems are of transitory nature.

## Regulation of data services

The initial regulation of international roaming included only voice services. In 2010 a wholesale price ceiling for sending SMSs were introduced, and it became free to receive SMS. Furthermore a protection of consumers from bill shocks by preventing download of data for more than 50€. Although it was realized that there was a need for regulation of data services as well voice services a price was not introduced before July this year with the latest roaming regulation package (Roaming Regulation III).

One complication is here that data services most often are offered in packages with either flat rate or with a ceiling on the amount of data to be downloaded per month. Another complication is that prices for data change much more rapidly than minute charges for voice services. This is reflected in the price caps. For instance is the retail price cap reduced from 70c€ pr Mb to 20c€ in two years. In the proposal from the Commission published a few month before the price cap in 2014 was set to 50c€ or two and a half time the amount adopted in the final legislation.

The demand for mobile broadband and the costs per Mb develops in such a pace that it is not unlikely that a price cap will be way above the actual costs, and regulation may therefore result in a preservation of high charges rather than leading to price reductions.

---

<sup>2</sup> European Commission on the interim report on the development of roaming services within the European Union. Brussels, 29.6.2010 COM(2010)356 final.

<sup>3</sup> REGULATION (EU) No 531/2012 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 13 June 2012 on roaming on public mobile communications networks within the Union

## The costs of international roaming services

The costs of international roaming are determined by four different cost drivers:

- Mobile origination (MO)
- Mobile/Fixed termination (MT/FT)
- International Transit (IT)
- Roaming specific costs (RSC)

Mobile origination includes the cost of initiating the call and for connecting the callers mobile terminal with the core network. Mobile termination includes the call related to bring the call from the receivers core network to his mobile terminal. The international transit costs include the costs related to connect the callers and the receivers core networks. Roaming specific costs include cost directly related to the roaming transaction. This is the kind of costs, which are not included in a normal international call.

The costs of mobile origination are comparable to those of mobile termination. For data services it may even be difficult to distinguish between origination and termination. For voice mobile termination rates are subject to regulation within the EU and are in principle cost-based. Mobile termination rates per minute varied in October 2007 before regulation was implemented between € 0.0206 in Cyprus and € 0.1882 in Bulgaria. However in most countries the rates were close to the EU average of € 0.0967. The European average for local fixed termination is € 0.0083. In 2011 the European average MTR was reduced to € 0.04<sup>4</sup>.

International transit costs depend on the inter-operator tariffs agreed between operators. These tariffs are confidential, but the costs are far below the cost of origination and termination. Various EU impact assessment reports estimate that international transit costs and roaming specific costs amount to around € 0.02 each.

A rough estimation of the costs of international will therefore be around 24 € 0.24 per minute in 2007 and € 0.12 in 2011. The use of the LRIC approach, which is applied for regulation of other kinds of telecommunication services e.g. interconnection, results in somewhat lower costs (5.42c€). If retail costs are included the costs amount to 6.69-8.13 c€).<sup>5</sup>

## Supply and demand conditions

The market for international for international roaming services differs in many ways from the markets for other mobile services. The special characteristics of this market have been studied in a number of reports and research papers e.g. (Stumpf, 2001). A formal mathematical model of the market is presented in (Salsas

---

<sup>4</sup> BEREC: MTR Benchmark snapshot (as of July 2011) BoR (11) 35.

<sup>5</sup> Impact assessment of policy options in relation to the Commission's review of the functioning of regulation (EC) No 544/2009 of the European Parliament and of the Council of 18 June 2009 on roaming on public mobile telephone networks within the Community COM(2011) 407 final

and Koboldt, 2004) and further extended in (Lupi and Manenti, 2006). The Commission has also created a model in their impact assessment report (CEC, 2006a).

### **Demand conditions – Retail**

According to the impact assessment report international roaming is used by at least 147 million EU citizens, of whom 110 million are business customers, while 37 million are travelling for leisure purposes (CEC, 2006a).

Although international roaming is an important service used by a large group of customers, most subscribers use this service only occasionally, and the level of roaming charges are relatively unimportant for the total cost paid by a mobile subscriber. Therefore only few subscribers will let their choice of operator depend on the roaming charges offered.

Another characteristic of roaming services is that it involves use of many different visiting networks, so even high volume users may only gain a minor benefit by reductions in wholesale roaming charges by a particular operator.

An alternative to international roaming is to acquire a local SIM-card and in this way to avoid paying roaming charges. This solution is in particular attractive for placing local calls abroad, and is used by many potential high volume users of international roaming.

Even though the level of roaming charges is not used as a parameter in competition, it might still be a price elastic service. According to a European fieldwork on roaming prepared in 2006, the main reason for using the mobile phone less while travelling abroad is excessive costs, and six out of ten Europeans would use their phone abroad if prices were more attractive (2007c).

The impact assessment report from 2006 assumed estimate that price elasticities were between -0.55 and -1.20 (CEC, 2006a), and argued on this background, that there would be substantial welfare gains associated with price reductions towards costs based prices (If elasticity are -1.20, even operators revenue will increase).

It should however be noted that the majority of the subscribers using international roaming are business customers, which are likely to be less price sensitive than private customers. Another factor, which may lead to low price sensitivity is lack of transparency. If users are unaware of the actual prices, price reductions will not lead to a higher demand. Use of SMS informing about roaming charges sent to subscriber arriving in country makes the prices more transparent and may therefore increase price elasticity.

The development in demand since regulatory intervention led to substantial price reduction indicates that price elasticities are lower than expected, and later studies estimate demand to be much lower. It seems that private consumers simply consider roaming to be a service which is too expensive to use, and that further reductions are needed before international roaming is used in the same way as domestic mobile services.

### **Supply conditions – Retail**

Suppliers at the retail market include all mobile operators at the national market. As with most other telecom services, the retail market is more competitive than the wholesale market as it includes network operators as well as virtual operators and service providers. Although the suppliers are identical to those offering other mobile services, the market seems to be less competitive. At least the mark-ups demanded by the operators are much higher than mark-ups on other mobile services. The reasons for this is that international roaming is bundled with the subscription for domestic mobile services (unless the customer buys a new SIM-card), are that customers consider roaming rates to be of minor importance compared to rates for other services.

### **Demand conditions – Wholesale**

International roaming services is demanded by all mobile operators offering international roaming to their retail customers. Only few operators with an international footprint are able to handle part of their roaming within their own network, while others other – including virtual network operators – will need to buy roaming services from local mobile operators.

Operators will charge their retail customers a price covering the wholesale roaming costs plus a mark-up covering various retail costs such as billing and customer handling. The incentive to reduce wholesale costs depends on how price sensitive the retail customers are. In addition, for technical reasons, it is not always possible for the home network network operator (HMNO) to choose the visiting network operator (VMNO) offering the lowest price.

### **Supply conditions – Wholesale**

Non-roaming international mobile calls can be handled within the same framework as fixed international calls. Before the liberalization international fixed calls were priced according to the international accounting rates. The system with international accounting rates dates back to 1865, when the predecessor of the International Telecom Union (ITU) were created. The rate determines how much an operator in one country needs to pay for termination of a call in another country. These rates are negotiated on a bilateral basis and are loosely connected to the costs of maintaining end-to end facilities between the two countries (ITU, 1996).

Payments of international roaming calls are organized in a similar way as other international calls: The call is handled by the operator, where the call is originated. If this involves use of services from other operators, these operators are paid wholesale charges by the originating operator.

In international roaming the call is originated in a visited network and the visited network operator (VMNO) will therefore charge the home network operator (HMNO), holding the subscription of the caller, in order to cover its costs. This payment is settled through the Transferred Accounting Procedure (TAP) by use of Inter Operator Tariffs (IOT)(Gullstrand, 2007).

For receiving international roaming call, the situation is slightly different. Here, the caller will pay for the price for termination of the call in the home network of the roaming subscriber. The HMNO will then transfer the call to the VMNO, who will receive the usual mobile termination rate for terminating the call.

In addition to this, the HMNO must pay the international transit charge for a call. Thus the IOTs used for originating roaming calls are not used in this case.

The number of suppliers of roaming services is same as the suppliers of wholesale mobile services in the respective countries. In most countries all mobile network operators are required to provide roaming services to foreign operators. Thus the number suppliers is 3-4 in most of the EU countries, and it could be expected that the level of competition on roaming services should be at a level similar to that for wholesale provision of other mobile services.

However, IOT have not followed the same decreasing price trends as wholesale charges for other mobile services. Up to 1998 IOTs were based on normal network tariffs for local call with a mark- up at 15% (Salsas and Koboldt 2004). But since then local tariffs have declined due to price competition. IOTs have not been subject to the same kind of competition, operators within the same country use similar IOTs, and if they relate to normal network tariffs they are set according to the highest rates offered.

There are a number of reasons for this:

- Technical: Limitations in the choice of VMNO;
- Tariffs are agreed on reciprocal basis;
- Demand conditions and lack of transparency.

As noted above, it is not always possible for the HMNO to choose the VMNO with lowest IOT. This implies that suppliers of roaming services cannot gain market shares by reducing their roaming charges. Market shares of VMNOs are independent of their charges, and therefore, there is no incentive to lower charges as it just will decrease revenues.

IOTs remind in many ways international accounting rates. Usually agreements are reciprocal in the sense that IOTs are independent on the direction of the call. In a market where competition is limited, the HMNO and the VMNO have a common interest in keeping IOT at a high level. The VMNO will get higher revenue for providing the roaming, the HMNO will be able to transfer the roaming costs to its retail customers, and will therefore not suffer from this. When a roaming call is made in the opposite direction it is the other operator who benefits.

The international accounting rates contributed to keep international telephone charges at an artificial high level for many years, and prices came down only when it became possible for retail customers to choose an alternative international operator offering lower charges.

The final point to mention is the impact demand conditions and lack of transparency. In elastic demand caused by lack of market transparency as well as other factors implies that suppliers are less eager to reduce costs. For instance there is no incentive to solve the technical complications related to choosing the cheapest VMNO, if cost reductions don't lead to increased traffic demand.



## Development of alternative solutions

Competition among mobile operators providing the same service is not the only way to drive down prices on international roaming. As for many other kinds of communication services, use of new technologies creates new substitutes, which can replace the demand for the original services. If these substitutes are offered at cheaper rates, this will put a pressure on existing tariff structures. The importance of this will depend on how perfect the substitutes are, i.e. whether the substitutes can fulfill the same service needs.

International roaming is a service that most customers use only occasionally, so it is important that substitutes are easy accessible and easy to use.

The most obvious alternative to international roaming services is to acquire a local SIM-card. This makes it possible to make local call at local tariffs. Calls to and from the home country or to a third country can be made at international rates, which usually are below the international roaming rates (but often much higher than the actual costs). The disadvantage is of course that you need to replace the SIM card and that you have to use a new number. A multiple SIM card phone will enable you to receive calls on your home country number, while you are making your calls using a different SIM card. For obvious reasons operators do not promote the use of multiple SIM card phones, but it is certainly an alternative for users, who often needs to call from abroad.

Another alternative is to use a local Wi-Fi connection and in this way bypass the mobile operator. This alternative is most obvious for data traffic, but can also be combined with the use of IP telephony. The advantage depends on the availability of a reasonably priced Wi-Fi network. The increasing market share of smartphones and use of mobile data make this alternative more relevant.

Bluetooth can be used in a similar way by Bluetooth enabled phones. Blue Town [bluetown.com](http://bluetown.com) has developed a solution for making calls via Bluetooth without using a sim card. The solution is developed for use in rural areas without mobile coverage, but it can be used as a low costs alternative in other areas as well.

One example of a hardware based alternative is a solution offered in Denmark by Interfone. When a user registers as a customer with Interfone, the company will provide a chip that must be installed on the top of existing SIM-card (se figure 1).

**Figure 1. The Interfone chip**



Once the chip is inserted, international calls are made as usual. There is no need to activate anything or to dial an extra number. Neither is access to a Wi-Fi network needed. The person who receives the call will in a normal way see or register who is the calling person/number. The only difference is that the line or the connection will be established with a slight delay.

While in Denmark the chip is activated every time an international number is called. The chip takes over the handling of the call, and direct the call to the desired destination through Interfone's server, and the user is charged as for a local call with a small surcharge. If the customer is abroad, the call will be terminated and the server will call back and establish a connection to the number dialed. The customer has to pay the roaming rate for receiving a call and a surcharge to Interfone.

Currently Interfone has only a server in Denmark and when the person is outside Denmark, but when servers are established in other countries as well, both the roaming charge and the international charge can be avoided.

## Discussion

Regulation of international roaming is more complicated than regulation of other telecom services for two reasons. First the market structures on mobile markets are different than on markets for fixed services. Markets for fixed services are dominated by one incumbent operator on each market who has its own fixed infrastructure. Regulatory intervention demanding open access to this network will benefit new entrants and promote competition at least in the short term. In mobile markets, the situation is slightly different as more competing mobile infrastructures are available. It is therefore less obvious what the market implications will be, if a similar kind of obligation is imposed on mobile networks. Second, regulation of international roaming is difficult to implement at national level as operators from more than one country are involved.

For these reasons, a common framework for regulation was not adopted at EU level before 2007. International roaming was defined as a separate market in the market definitions applied in the EU regulatory framework, but the implementation of the new telecom regulation package has not led to any intervention on this market at national level. Market studies for this particular market were among the last

to be implemented. In August 2006 market analyses for other telecom services had more or less been completed in most countries, but only Finland had made a decision on international roaming; here the conclusion was that the market was competitive. Since then, no other member states have decided to intervene at the market for international roaming. Regulation of the market for international roaming seems to be more difficult for national regulators to handle than regulation of markets for other telecom services.

The proposal for regulation of international roaming put forward by the EU Commission suggested the introduction of price caps in both retail and wholesale markets for international roaming. The major argument for such heavy-handed regulation was that international roaming prices were much higher than cost-based prices, and that roaming charges represented a major barrier towards growth in international mobile communication within the EU.

An interesting aspect of the proposal from the Commission is the use of a European home-market approach, which implies use of common price caps for all EU member states. This implies that determination of price caps are moved from national to European level. This may therefore be seen as a step towards decreasing the power of national telecom authorities and strengthening regulation at EU level. A common price cap improves transparency for consumers, but it may create a situation where operators in high cost countries may have difficulties in covering their costs in full. It may also create strange pricing schemes, where international roaming becomes cheaper than national roaming.

Both wholesale charges and retail charges have been subject to intensive debate. From the beginning operators were very much against any form of regulation, in particular at the retail level. In spite of ample documentation proving excessive rates without any relationship to costs, it is claimed that there is effective competition on the international roaming market.

Also some Governments have been very reluctant towards regulation. In particular in tourist destinations in Southern Europe, international roaming has proved to be an important source of income.

The EU intervention is a compromise between those asking for cost based roaming charges and the interests of operators – particular those operating in major tourist destinations. Nevertheless seen from the consumers' point of view, it is a considerable improvement compared to the former situation, and it was implemented with an impressive speed (less than one year after the proposal from the Commission was published). It is also a move away from regulation based on more or less objective economic evidence towards regulation based on political negotiations between parties with conflicting interests.

## References

(2007). "Roaming - Fieldwork September - October 2006." Special Eurobarometer European Commission no. 269.

CEC (2006). Impact Assessment of policy options in relation to a Commission Proposal for a Regulation of the European Parliament and of the Council on Roaming on Public Mobile Networks within the Community.

CEC (2011). How much do you pay when you use your mobile phone abroad?

[http://ec.europa.eu/information\\_society/activities/roaming/tariffs/](http://ec.europa.eu/information_society/activities/roaming/tariffs/) Accessed 20 November, 2011.

Falch, M., Henten, A., & Tadayoni, R. (2009). International roaming: Is there a need for EU-regulation beyond 2010? *Info*, 11(4), 19-33.

Gullstrand, C. (2007). "Tapping the Potential of Roaming." Retrieved 15 January, 2008, from <http://www.gsmworld.com/using/billing/potential.shtml>.

ITU (1996). Direction of Traffic, 1996: Trends in international telephone tariffs ITU/Telegeography Inc.

Lupi, P. and F. Manenti (2006). Roaming the woods of regulation: public intervention vs firms cooperation in the wholesale international roaming market, Università degli Studi di Padova.

Salsas, R. and C. Koboldt (2004). "Roaming free? Roaming network selection and inter-operator tariffs." *Information Economics and Policy*(16): 497-517.

Stumpf, U. (2001). Prospects for improving competition in mobile roaming. 29th TPRC 2001, 27-29 October, Alexandria, Va.

Sutherland, E. (2008). "The Regulation of International Mobile Roaming" *INFO*(Vol. 10 No. 1 2008) 13-24.