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**DIRECTORATE FOR SCIENCE, TECHNOLOGY AND INDUSTRY
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Working Party on Communication Infrastructures and Services Policy

INTERNATIONAL MOBILE ROAMING AGREEMENTS

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FOREWORD

The Working Party on Communication Infrastructures and Services Policy (CISP) discussed this paper in June 2012. It agreed to recommend the paper for declassification to the Committee for Information, Computer and Communications Policy (ICCP). The ICCP Committee agreed to its declassification in October 2012.

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MAIN POINTS

This report explores principles that could form the basis for good practices in the establishment of international mobile roaming (IMR) agreements between two or more countries. Given the cross-country nature of IMR services and, especially, the fact that wholesale prices are determined by foreign operators outside the jurisdiction of domestic regulators, international co-operation is vital to address the challenges in roaming markets. The conclusions of this report are consistent with the principles outlined by the OECD Recommendation of the Council on International Mobile Roaming Services, adopted in February 2012.

There is a growing number of IMR agreements, usually reflecting the most travelled international routes. For example, the European Union enacted regulation in 2007 that covers roaming routes within that area. Other examples of agreements already in place are: the Gulf Cooperation Council in the Persian Gulf Region, Russia with Poland and with Finland; and the countries of the Association of South East Asian Nations (ASEAN), including roaming between Singapore and Malaysia. In addition, there are ongoing discussions between Australia and New Zealand and in the South African and South American regions. Each one of these agreements or ongoing initiatives has a number of features that depend on national and regional circumstances and are examined in this report.

Any IMR agreement between two or more countries should provide a clear view on which existing legal instruments will be used by the signatories to implement its provisions. These countries should first make sure that the national authorities are vested with the statutory powers that allow them to regulate roaming prices and that the conditions for doing so are specified.

IMR agreements can also be based on Memorandums of Understanding (MoU), whereby policy makers bring the operators together to agree to lower wholesale prices. This report underlines that in certain markets the balance of traffic between mobile networks makes it feasible to initiate substantial reductions based on voluntary agreements or, if necessary, regulatory intervention. In this respect, the report notes an increasing number of requests for lower wholesale rates, including by numerous mobile operators.

IMR agreements should take into account the countries' existing trade obligations, especially those related to the World Trade Organisation (WTO) framework, including the General Agreement for Trade in Services (GATS). While the legal instruments used in existing agreements vary according to the powers available to national authorities, it is clear that international agreements can be consistent with WTO provisions. This can include the use of supranational powers in some regions or the use of Free Trade Agreements (FTAs) to underpin regulatory intervention.

In line with the OECD Council Recommendation on International Mobile Roaming (IMR) Services, it is necessary to specify a sequence in terms of the appropriate interventions that might be considered by regulators in certain markets. This report highlights a number of concerns that can be avoided by adhering to the recommended principles. In particular, wholesale pricing by itself may be only effective when there are clear competition dynamics at the retail level for roaming services, ensuring that wholesale rates will feed through to the retail consumer without the need for further retail price regulation.

As further IMR agreements are likely to be used to regulate wholesale and possibly retail prices, a rationale for the level of regulated prices should be provided. This does not necessarily mean that complex costing methodologies should be part of the agreement, but it should specify how the regulated price will be ascertained. In particular, this report favours top-down, simple methodologies that bring prices down to reasonable levels, which should still lie well above the cost of providing the roaming service.

Agreements should also provide the basis for co-ordination among the signatories. Co-ordination may happen at several levels, for example, by providing available evidence about the actual level of retail and wholesale pricing in all the countries signing the agreement or by ensuring that any downward glide-path (i.e. price trajectory) for wholesale or retail regulation is coherent across countries. Finally, these agreements may also include provisions on the timing for the implementation of transparency measures.

As the IMR initiatives considered in this report ultimately represent an agreement between two or more countries, they should always include a mechanism to monitor compliance and enforcement, to allow countries to withdraw from the agreement and, optionally, to extend the agreement to third countries and, if so, under what conditions.

Some of the measures that are recommended for consideration by policy makers could be implemented unilaterally. However, in the framework of possible bi- or multi-lateral agreements on international mobile roaming, countries should ensure a consistent approach between both types of measures. An example of the latter may be structural measures. These measures are targeted at improving the competition dynamics in roaming markets, by removing possible structural limitations.

Allowing mobile virtual network operators (MVNOs) to have access to regulated wholesale roaming prices is one of these proposed structural measures. While this measure could be implemented by individual countries, it is vital that there is some degree of co-ordination with the terms established in a wholesale price regulation agreement, as well as on the level of those regulated prices, so that MVNOs are in a position to create sustainable business models.

INTERNATIONAL MOBILE ROAMING AGREEMENTS

Introduction

In February 2012, the Recommendation of the OECD Council on International Mobile Roaming Services, laid out a series of measures that policy makers could take that would encourage effective competition, raise consumer awareness and protection and ensure fairer prices. It sets out a structured, step-wise approach to regulatory policy and measures to be considered by OECD countries when considering IMR regulation as follows:¹

- Promote awareness and transparent pricing (Recommendations 1-4)
- Facilitate transnational alliances and operators and promote transparent Inter-Operator Tariffs (IOTs)- (Recommendations 5-7)
- Lower barriers to entry if possible (Recommendation 8)
- Where possible, the determination of wholesale roaming prices should be left to the market. If members determine that market dynamics are insufficient to produce reasonably competitive wholesale price, they are encouraged to regulate wholesale roaming prices, including by reaching bi- or multilateral agreements between Members (...) (Recommendation 9)
- If Members determine that market dynamics are insufficient to guarantee reasonably competitive retail prices they should, as a last resort, implement retail price regulation (...) (Recommendation 10-12).
- When assessing the appropriateness of introducing wholesale and/or retail roaming price regulation, Members should undertake an impact assessment (...) (Recommendation 13).

The Recommendation noted:

Where possible, the determination of wholesale roaming prices should be left to the market. However, if Members determine that market dynamics are insufficient to produce reasonably competitive wholesale prices, they are encouraged to regulate wholesale roaming prices, including by reaching bi- or multilateral agreements between Members, as appropriate, and/or through the introduction of price caps based on commonly established principles. Members' trade obligations, including WTO provisions and principles, should be observed when assessing the possibility of reaching agreements on wholesale price regulation.

The OECD Recommendation forwards a number of measures that countries should consider in order to make competition more effective in international mobile roaming, to aid consumers and businesses undertake trade and travel, as well as further develop the market in a way that benefits all stakeholders. Some of these measures can be undertaken by countries unilaterally, such as is the case for most transparency measures, making available information about roaming prices or substitutes, putting in place cut-off limits on users to protect users from “bill-shock” or even retail price regulation. These can be undertaken under that country’s authority.

Other measures, however, are generally regarded as needing co-operation between countries. If wholesale price regulation was undertaken, on a unilateral basis, it may only benefit foreign operators and potentially their customers, thus leaving domestic customers unaffected and diminishing the motivation of the regulator to act on this matter. Moreover, retail regulation without addressing the wholesale level may originate margin-squeeze situations, especially for operators that do not have the ability to negotiate lower wholesale prices in other countries. Therefore, this report builds on the fact that bi- and multilateral co-operation, in the form of international roaming agreements, is critical for addressing most of the important issues in roaming markets.

This report examines a growing number of international agreements that have emerged in recent years, as policy makers and regulators determined that market dynamics had not led to reasonably competitive wholesale prices either in their region or on bi-lateral routes. Some examples, considered here, are the regulatory interventions in the European Union and the Gulf States (Gulf Cooperation Council) as well as a number of bi-lateral initiatives (*e.g.* Russia-Finland, Russia-Poland and Malaysia-Singapore). This report also touches on existing discussions in other parts of the world, such as the joint Australia-New Zealand investigation, that could lead to further bi-lateral and/or multi-lateral agreements on international mobile roaming services.

Background

International roaming is a service that allows a customer of a mobile operator in one country to obtain service (voice, SMS or data) from an operator in another country using the same handset and the same telephone number, facilitated by a common technology and a wholesale inter-operator contract.

While there have been reductions in roaming charges, in some countries over recent years, prices remain very high across the OECD area compared to those prevailing nationally. The prices of roaming services have generally not moved downwards in line with national pricing patterns resulting in an increasing gap between national and roaming mobile call charges. As a result many users limit their usage and often either switch off their phones or disable certain applications or seek to find – imperfect– substitutes to using their regular services.² Some parts of the industry call the phenomenon “silent roaming”.³ The resultant welfare loss corresponds with the classic description of deadweight loss in the economic lexicon in which neither consumers nor producers benefit.

International roaming differs from other telecommunication services in that the wholesale and downstream retail markets are always in different countries. The ability of policy makers and regulators to act unilaterally is limited to measures that can be delivered nationally such as transparency measures for end-users or, in most cases, regulating retail prices. Transparency regarding roaming services is important as it raises awareness and can allow consumers greater control. Stimulating awareness can increase consumer price sensitivity, which in turn can put pressure on suppliers to react. Other measures, such as structural measures to allow MVNOs to access wholesale roaming services or implementing retail price regulation, can also be undertaken at the national level.

Some attempts have been made regarding self-regulation on a voluntary basis by the industry itself (sometimes with prodding by regulators) but with mixed results. By the time regulation was first proposed in the European Union the level of awareness by consumers of roaming charges was very low with more than 40% demonstrating a poor understanding of charging structures and levels (Sutherland, 2012). Even voluntary initiatives by some operators in Europe to introduce on-net roaming, across countries where they own networks and are therefore not subject to on-net wholesale charges, have been discontinued. Operators that have wound back such options for users say that this is a result of users roaming off-net and not understanding the high charges this can prompt.

This is why, if policy makers choose to control wholesale prices, a high level of co-operation between two or more countries is required given the structure of the market. It is useful to consider the ways in which the roaming market works before examining the way in which governments have sought to intervene to protect consumers. This is critical because any such intervention needs to take into account the effects such a move may have on market dynamics.

Problem description

Roaming services are traded at two levels, at the wholesale level and again at the retail level. At the wholesale level, mobile operators agree to provide services to the customers of other operators for a wholesale charge. The operator whose customer is roaming directly bills its customer for that service. At the wholesale level there are, in practice, two transactions which take place simultaneously between operators. An operator in country A is seeking roaming services from operators in country B (buying roaming services), while at the same time offering to sell roaming services in country A to operators in country B.

It is well documented that operators in certain markets seek to balance traffic to the greatest extent possible, in the first instance, and subsequently seek to negotiate the price for services at the margin. If we consider an extreme in such cases where two operators have traffic volumes which are perfectly in balance, one in country A and one in country B, then if the rates offered are reciprocal which is normally the case, then the net payments are zero. The actual costs faced by the first in question are the costs of service provision, which at the margin will be extremely low. In this instance, either operator has the possibility to offer retail services at a much lower rate if it chooses to do so.

While the case of perfectly balanced traffic is an extreme, a large amount of traffic is likely to be balanced off on virtually all bilateral market pairs or, as is often the case, in negotiations between large groups or alliances which transcend such country pairs. However, experience has shown that large operators, who already have a greater ability to balance off traffic, do not seek to put rates into the retail market at levels that would be expected in a competitive market, even though balancing gives them the wherewithal to do so.

In fact, with some particular exceptions, very high rates for roaming services have been a universal phenomenon triggering a range of interventions around the world, which this paper describes in broad terms (e.g. European Union, South-East Asia, Gulf Co-operation Council). Even where price controls are in place, roaming charges are frequently set as close to the maximum permissible rate available (e.g. voice roaming rates in the European Union).

High retail prices may be maintained by operators as long as they believe the price elasticity of customers is low. This is certainly the case as roaming services are rarely on the minds of customers when they are making their purchase decisions. In addition, roaming services were once marketed as premium services for some time, although they are now available to virtually every mobile customer, including prepaid. There are different views between policy makers and operators as to what is going on in the market and whether there is a market failure to be addressed by policy or not.

In the normal course of events, a wholesale intervention which resolves the market failure is preferred because it would allow some level of competition at the retail level, provided that the right incentives are present. It should then only be a last resort measure, where no wholesale intervention which resolves the market failure can be found, that a retail intervention should be even considered.

The risks of retail intervention are arguably exemplified in that area that was amongst the first to move against very high retail prices, the European Union. Wholesale price controls and retail price controls

have been in place since the beginning of roaming regulation. Legislators and policy makers are now seeking to devise mechanisms that would allow such retail price controls to be removed, since the alternative may be regulation in perpetuity. After an assessment of the different policy options certain mechanisms have been identified to push wholesale price controls through to the retail level.⁴ These mechanisms are untested and may be costly to implement with no certainty as to their success (an assessment on their performance will take place in 2016).

The European Union is not alone in its approach and some other countries which, to date, have sought to control roaming rates have also imposed both wholesale and retail controls simultaneously. The question arises whether this was justified or whether a more orthodox, step-wise approach, which imposed wholesale controls first and only then imposed retail price controls, could have yielded sufficiently good results for consumers. Such considerations are best dealt with in terms of a detailed impact assessment that balances the different options and judges the costs and benefits of each, taking into account different market conditions. Nevertheless, it should be recognised that retail price regulation has an immediate, tangible effect on prices and consumer welfare, which lie at the heart of policy and regulatory concerns that trigger interventions. On the other hand, the long term management of such a market structure may require ongoing interventions which in turn need to be more finely calibrated and to which market forces will be better attuned.

A number of commentators have observed that at the wholesale level operators face different incentive structures depending on their size. That analysis suggests that balancing traffic *i*) distorts the price signal making price less important at the wholesale level; and *ii*) it excludes smaller operators from competing in the wholesale market. It is this latter effect in particular which suggests that an appropriate intervention at the wholesale level could be sufficient to deliver positive results to consumers in the retail market (for example, Shortall (2010), Dominguez (2011) and Infante and Vallejo (2011)). This intervention should also provide sufficient incentives for competition at the retail level, for example, by means of structural measures (e.g. local break-out, decoupling of roaming services) in certain markets.

Wholesale prices become less important, with traffic balancing, because it reduces net payments asymptotically towards zero as the traffic approaches perfect balance. In these circumstances, and more particularly where negotiations for balanced and unbalanced traffic are separate, the payments for the balanced traffic become insignificant in real terms. If the price per minute of a million minutes of balanced traffic is USD 0.01 or USD 1, the net payments will still be zero. However, there is equally a well-established economic literature which demonstrates that it is the “headline prices” that can be determinative in setting retail prices. Therefore the balanced traffic may not matter to operators but it has a real impact on the market outcomes. This phenomenon was noted by the Body of European Regulators for Electronic Communications (BEREC) in its review of European Union roaming markets:

“In the wholesale roaming market, the majority of deals are reciprocal, so that purchasers buy and sell wholesale roaming from the same counterparty. Where the trade is intra-group or traffic is relatively balanced, in practice the unit price is of little consequence. For non-group trades, the volume of roaming sold may be of much greater commercial significance than the purchase price. In addition, the advent of traffic steering has meant that operators generally try to identify various preferred partners (in order of preference) to which the bulk of their traffic is directed. There appears to be a tendency to balance traffic as far as possible. There will usually be agreements for residual traffic with other operators to ensure good network coverage for their roaming customers. In effect, it is only this residual traffic which is subject to strong competition. Even so, for relatively small volumes of residual traffic, there is not much incentive to compete vigorously on price, especially for larger operators.”⁵

The previous description would suggest that the problem mainly lies at the retail level and it would certainly be the case for larger operators. However, smaller operators in a country who do not have a lot of traffic to send back, and therefore to balance-off, are disadvantaged in seeking to compete in the wholesale roaming market since they lack the bargaining power of larger operators or groups. No regulator anywhere in the world has proposed a mechanism that seeks to resolve this softening of wholesale competition except by proposing price caps that seek to lower wholesale charges toward production costs.⁶ Recent measures in the EU to introduce MVNOs are a step in this direction and may have an impact on the outcome in terms of pricing and pricing structure.

One implication of this analysis is that larger operators often have very low wholesale rates available to them. This is the case, in practice, even if the headline rates are those set out in the IOT. Those operators who do have effectively very low wholesale rates available have, however, not passed those rates on to consumers. If policy makers and regulators believe that all operators, regardless of size, are likely to react in the same way on the retail market, then that would suggest that the simultaneous imposition of wholesale and retail charges may be justified. On the other hand, seeking to use interventions at the wholesale level, before retail regulation was imposed, could test this hypothesis.

Smaller or unaligned operators are wholesale price takers because they lack the bargaining power of larger or aligned networks. Therefore, they cannot unilaterally put lower prices into the market. If, however, they have access to lower wholesale rates, these operators may have greater incentives to differentiate themselves and compete for subscribers by offering flat rate or bundled offers that compete for different market segments. In a sense therefore, it is not the retail elasticity of demand for roaming services which is the pertinent metric but whether bundled roaming can be part of a broader customer acquisition strategy that may encourage retail pass through of wholesale pricing or, at least, if it can be so for some operators.

There is some evidence that this may have happened in the past even in a less than perfect parallel. While national and international roaming occurs in different contexts they can be comparable, particularly in markets, such as the United States, where no operator has a nationwide network and all operators rely to varying degrees on national roaming to achieve nationwide coverage. The United States provides one example where an operator with access to lower wholesale rates coincided with a commercial desire to build retail market share. AT&T Wireless had bought a mobile operator (McCaw Communications) and established a significant network footprint across the United States market which was larger than that of any of its competitors. In May 1998, AT&T rapidly increased its market share when it introduced its Digital One Rate plan, which appealed to consumers as a simple nationwide calling plan. The Federal Communications Commission singled it out as one notable example of an independent pricing action that altered the market to the benefit of consumers.⁷ Today, all of that country's larger operators offer some version of a national rate pricing plan in which customers can purchase a bucket of minutes to use on a nationwide or nearly nationwide network, without incurring roaming or long-distance charges. These offers are available as a mechanism to acquire end-users rather than being advertised as stand-alone roaming services.

If smaller operators would be more likely to offer innovative or lower tariffs, to acquire consumers than larger operators (who often already have the capacity to do so), then retail pass through of lower wholesale charges could be expected regardless of the retail elasticity of demand.

Such an analysis would point strongly to the need to use a step-wise approach which introduces and monitors the effectiveness of wholesale price controls in advance of imposing retail price controls. This is consistent with the policy principles for international roaming in the Recommendation of the OECD Council. Those principles clearly advocate wholesale charge controls where they are needed but ahead of retail charge controls. Retail charge controls are seen as a 'last resort' only when other measures have

proven unsuccessful or, at a minimum, there should be a meaningful sequencing of retail and wholesale price regulation, so that the potential aggressive entry of smaller operators in the roaming market could be tested.

To date, for the most part, regulators intervening at the wholesale level have also taken action concurrently at the retail level. It could be noted, that in the European Union, data charges only faced a wholesale price cap in the second round of regulation without any retail price charge. However, the evidence is at best mixed since the caps sought to set a safety limit which was well above the generally prevailing level of wholesale charges and only sought to control what were considered outliers. In addition, the period of implementation before the review was such that some actors could consider that the time was short and a question arises over whether sufficient time elapsed before a retail intervention was sanctioned.

This report observes that most interventions, to date, whether implemented or not, sought to step past this principle of verifying the efficacy of wholesale interventions first and to introduce both wholesale and retail regulation simultaneously. In part this is because of the phenomenon described above, whereby at least certain operators already have the capacity to deliver very low retail prices but have chosen not to do so. It can also be noted that such interventions have had a high profile and been very popular with consumers of these services.

The initial interventions made on roaming markets share a number of other characteristics. The first is that concern over very high retail roaming prices, compared to national mobile rates, have triggered growing consideration for intervention. High roaming prices for both voice and data services have been observed by all policy makers and regulators taking action to date.⁸

Two final observations on international roaming agreements that have been studied here are that, first, some operators have a strong incentive to resist obligations being imposed on markets in which they operate. In these cases an appropriate legal instrument will be required if wholesale price controls are to be imposed.

A second factor, on perspectives regarding roaming, may also vary depending on whether an operator is a net receiver or net payer of roaming revenues. Too often this is cast by operators as being akin to countries being net outpayers or beneficiaries of such payments. This is an extremely narrow perspective in terms of the benefits for trade and travel that can arise from a more competitive mobile roaming relationship between any two or more countries (or one where regulation substitutes for the absence of competition at the wholesale level).

Operators in certain countries are, of course, significant net recipients of roaming revenues. As a result, the balance between consumer surplus losses and national producer surpluses within those countries may make co-ordination with other countries more difficult unless they consider the overall benefits for economic and social development resulting from such agreements.

Given that international roaming differs from other telecommunication services in that the wholesale and downstream retail markets are always in different countries, any consideration of international roaming must be undertaken on a bilateral or multilateral basis.⁹ Even then significantly divergent views regarding the status of roaming services will make agreement more difficult in the absence of broader considerations.

Country/regional cases

European Union

In the European Union area, a major revision of the telecommunication legislation took place a decade ago (the 2002 Framework) and this resulted in a series of directives.¹⁰ These directives were enacted in national law by the member states becoming effective in July 2003.

The new approach was incorporated in the 2002 telecommunications framework which defined markets at European Union level which would *a priori* be suitable for *ex ante* regulation, then having Member States analyse the markets, identifying any operators with dominance and imposing on them one or more of a set of specified remedies. One of the markets identified, in Annex 1 of the Framework Directive as a market that National Regulatory Authorities (NRAs) were obliged to analyse, was the National Market for International Roaming services. The definition of a roaming market was set out in the Recommendation on relevant markets.¹¹ In practice, therefore, the European Union regulatory framework seeks to mimic a competition law approach to interventions.

Though several NRAs examined the market for international roaming, none was in a position to identify dominance or appropriate measures to counteract the high prices observed in the market. High roaming prices persisted all the while and the national regulators observed that falling wholesale charges were not translating into retail charges.¹² Attempts to use a standard national market analysis procedure failed to address the problem observed. A revision of the Recommendation on Relevant Markets removed roaming from the list on the basis that the Regulation (717/2007) obviated the need for a market analysis, thus effectively ending the basis for NRAs to regulate the market based on the normal market regulation procedures.¹³

The first Roaming Regulation (717/2007) was proposed by the European Commission and was agreed through the normal negotiation process with the European Parliament and the Council of Ministers.¹⁴ These negotiations centred on the need for retail price controls, the legitimacy of the use of Article 114 which was concerned with measures critical to the Single Market and considerations regarding the merits of the proposal. The European Union roaming regulation entered into force on 30 June 2007. The legal instrument is a Regulation which means that it becomes law once it enters into force (so European Union Member States do not need to enact it in national law). This intervention was succeeded with a second roaming regulation (544/2009) which extended and lowered the existing caps on making and receiving voice calls and extended the caps to also cover the previously omitted SMS (wholesale and retail) and data transfers (wholesale caps only).

The second European regulation on roaming also forces operators to introduce caps on roaming data charges at USD 66 (EUR 50) per month. Under roaming Regulation No. 544/2009, mobile phone operators are obliged to offer their customers the monthly USD 66 cut-off limit, but they can also offer them any other limit. Until 1 July 2010, customers needed to make a deliberate choice in order to benefit from a cut-off limit but customers who did not make a choice by 1 July 2010 had the cut-off limit set at USD 66 by default as from that date.

Monitoring and enforcement of the Roaming Regulation is done by member states' national telecoms regulators who are responsible for ensuring that mobile phone operators comply with the rules on cut-off mechanisms for data roaming in each European Union country and the association of national regulators in the European Union area, BEREC, conducts regular reviews to monitor compliance.¹⁵

The third round of roaming has recently been agreed and entered into force on 1 July 2012.¹⁶ The key focus of the current round of regulation is on:

- Structural measures which oblige operators to allow the separate sale of roaming services from 1 July 2014 also through a wholesale roaming access obligation for any access seeker (e.g. MNOs, MVNOs, resellers) that came into force on 1 July 2012. End users will then be able to choose alternative service suppliers for roaming whilst retaining their national operators for domestic use. Home country providers would have to inform their customers of this right and any switch to an alternative roaming service provider would have to be free of charge. The new regulation introduces the Local Break Out (LBO), whereby domestic mobile service suppliers would also have to enable their customers to access mobile local data services while abroad without having to unsubscribe from their existing data roaming contract or arrangement, and while keeping their mobile number.
- And finally continuing cuts for wholesale and retail charges with the introduction of data retail charges as shown in tables 1 and 2 below.

Table 1. EU Wholesale Roaming Price Caps 2012-2014, EUR

	Before 1 July 2012	1 July 2012	1 July 2013	1 July 2014
Data (per MB)	0.50	0.25	0.15	0.05
Voice (per minute)	0.18	0.14	0.10	0.05
SMS (per SMS)	0.04	0.03	0.02	0.02

Source: BEREC and price cap information

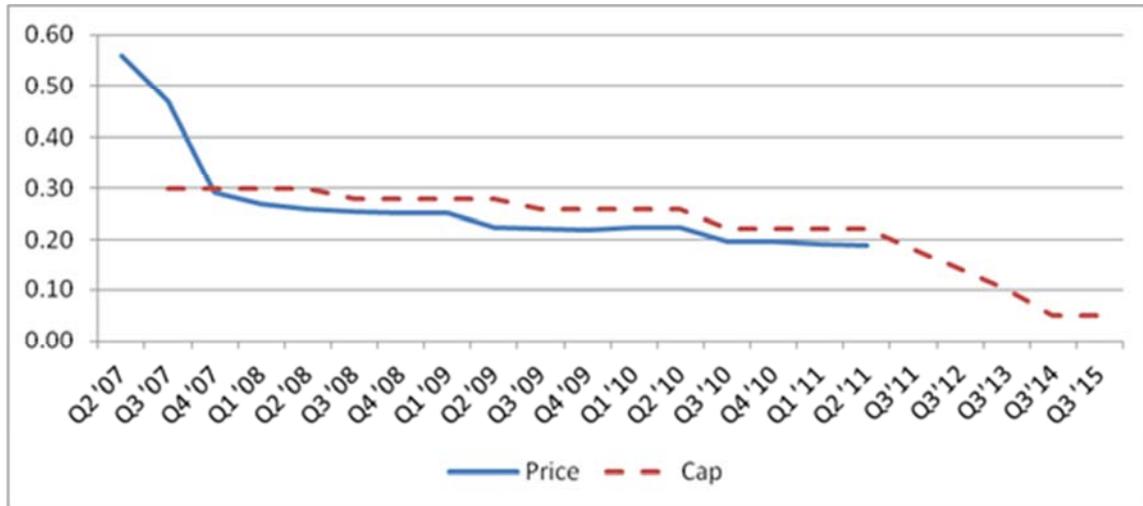
Table 2. EU Retail Price Caps 2012-2014, EUR

	Before 1 July 2012	1 July 2012	1 July 2013	1 July 2014
Data (per MB)	None	0.70	0.45	0.20
Voice-calls made (per minute)	0.35	0.29	0.24	0.19
Voice-calls received (per minute)	0.11	0.08	0.07	0.05
SMS (per SMS)	0.11	0.09	0.08	0.06

Source: BEREC and price cap information

The price impact on voice calls of the European Union roaming regulation can be viewed on wholesale voice calls graphically (Figure 1).

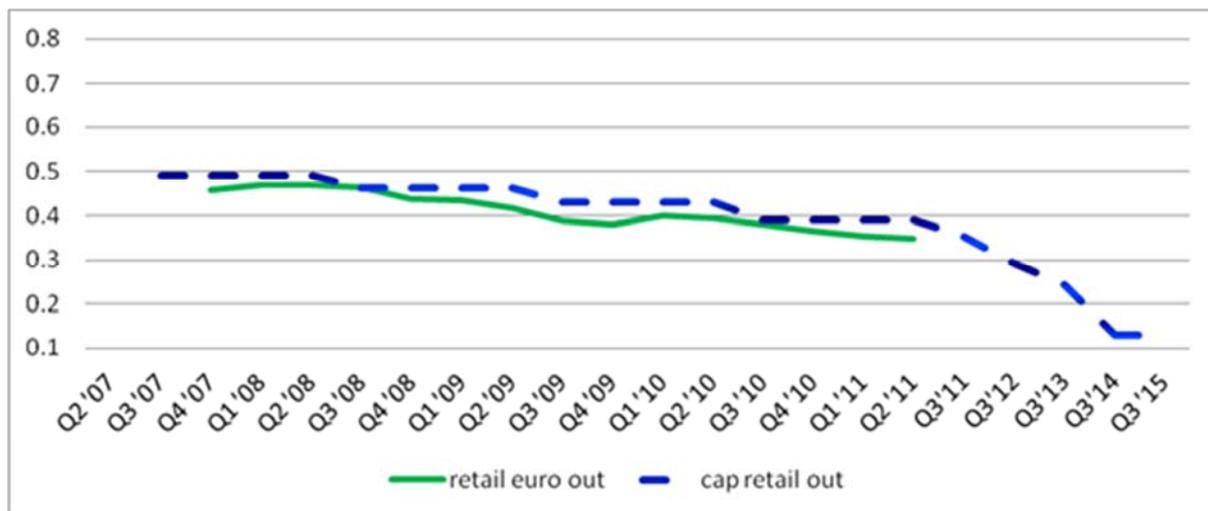
Figure 1. Wholesale Voice Call Charges, EUR



Source: BEREC and price cap information

Similarly, the retail price caps imposed for voice calls made whilst roaming in the European Union can be observed (Figure 2).

Figure 2. Retail outbound voice call charges, EUR



Source: BEREC and price cap information

Some operators in the European Union area have publicly noted that they already have wholesale rates at USD 0.065 (EUR 0.05) per MB or better and a number of operators have observed that there is evidence of significant elasticity in relation to data traffic.¹⁷

One risk worth observing is that identified price levels can forestall market based competition for certain products. This may be less of an issue where there is a market failure that cannot be addressed at a wholesale level but is more of an issue where there is no conclusive evidence of a market failure. Specifically, the evidence from Europe suggests that retail prices follow the retail price caps very closely for voice services, as the necessary incentives for retail competition are not in place. This can be seen in the graphs above where historically the retail and wholesale prices have stayed very close to the price caps.

With respect to the structural measures proposed in the Regulation, the Commission adopted in December 2012, after obtaining an opinion from BEREC and taking into account the views of the member states as expressed in COCOM, the “Implementing Regulation” (EU No. 1203/2012) on the technical solution for the separate sale of regulated retail roaming services.¹⁸

In July 2012, BEREC opened a public consultation on technical measures needed to deliver the structural measures. Based on input received during this process, BEREC published a report in October 2012 addressing the main conclusions on the method to be applied for the separate selling of international roaming services in the EU, as well as the obligations to be imposed on operators to enable its implementation. The Implementing Regulation confirms the conclusions of the BEREC opinion. It should be noted that the European Union structural measures simply seek to push the wholesale savings through to the retail level. None of the European Union structural measures addresses the level of pricing in the wholesale market directly.

Regardless of the clear political and economic rationale for intervention in Europe, some observations may be made concerning the form and the implementation of the European roaming regulations so far, which addresses roaming routes among countries in the European Union (intra-EU routes).

First, the roaming regulations were issued on the basis of strong legal instruments, namely by the Treaty of the European Union. Within this treaty, European legislators resorted to internal market principles as the rationale for intervention. As a result, lower roaming prices were found to be critical to create a true internal market within the European Union. This approach was later on backed by the European Court of Justice.

Secondly, in the European Union both retail and wholesale prices were regulated, except initially for data roaming services, where only wholesale price regulation had been implemented until 2012 and since 1 July 2012, both retail and wholesale prices are also regulated. While these interventions certainly reduced prices for end-users, they have not addressed a dysfunctional market, as proves that actual retail prices for all services remain pegged to the regulated caps. This approach is now changing and the newly proposed roaming regulation contains structural measures that attempt to introduce some degree of retail competition driven principally by market entry.

Finally, the European Union approach used the mobile termination rate (MTR) benchmark as a reference to establish the regulated roaming price. While many alternative approaches could be considered, this one provides enough simplicity. In parallel, BEREC has undertaken significant work in estimating the actual cost of providing the service, and evidence to date is that both wholesale and retail caps are well above the estimated costs but remained cautious on the level of voice cost in 2014 as it depends on the implementation by the NRAs of the Commission Recommendation on the Regulatory Treatment of Fixed and Mobile Termination Rates in the EU. BEREC also provide interesting data on the cost for transit and billing, which it believes to be negligible.

Australia-New Zealand

The Australian Competition and Consumer Commission (ACCC) has, since 2003, conducted reviews into a number of mobile services provided in Australia as part of its Mobile Services Review. Under s. 28(1)(c) of the *Trade Practices Act*, the ACCC has the function to conduct research into matters affecting the interests of consumers, being matters with respect to which the Parliament has power to make laws. Under Division 12, Part XIB of the *Trade Practices Act*, the ACCC reports on changes in the prices paid by different classes of consumers for a range of fixed-line and mobile telecommunication services. The Act requires the ACCC to provide this report to the Minister for Broadband, Communications and the Digital Economy, annually.

The ACCC 2005 report on mobile roaming expressed concerns that prices for international roaming services appeared to be very high – especially as compared to charges set for other mobile telephone services. The inquiry also found that the most significant factor in the setting of retail prices paid by Australian travellers for international roaming services are the wholesale charges set by overseas mobile network operators when consumers roam onto their networks.

That report also noted that while wholesale charges set by overseas mobile network operators are likely to be inflating the price of international roaming services for Australian travellers, the ACCC did not have jurisdiction to directly regulate wholesale charges set by overseas mobile operators. The ACCC believed that market developments might drive greater price competition among mobile operators and improve price transparency and simplicity for end-users. The inquiry also found that the information provided by mobile operators to consumers about the prices for, and the use of, international roaming had improved.

The ACCC committed at that time to continue to monitor the average prices paid by Australian consumers for international roaming services and to work with other regulatory authorities to address concerns in relation to the provision of international roaming services.

The Australian and New Zealand governments conducted a joint market investigation into the price for businesses and consumers of using mobile roaming services between both countries between April 2011 and February 2013. The final report of this investigation found, among other things, that although there has been a downward trend in trans-Tasman mobile roaming prices and margins, both prices and margins remain high.

On 23 August 2012 the Australian Minister for Broadband, Communications and the Digital Economy directed the Australian Communications and Media Authority (ACMA) to make an industry standard which would require providers of mobile roaming services to give consumers clear information about the pricing of international roaming services upon arrival at their overseas destination, as well as the ability to opt out of purchasing these services. This standard was to commence within 12 months of the direction.

On 9 February 2013, the prime ministers of Australia and New Zealand announced their countries will work together to address the high costs to business and consumers of using mobile roaming across the Tasman. The governments of both countries are aiming to enact legislation, giving effect to the findings of the joint investigation, by the end of 2013.

AREGNET and GCC

AREGNET was established in 2003 as a forum for Arab Telecom Regulators to exchange experiences and co-ordinate regulatory efforts. Consumer complaints had already highlighted the problem of excessive international roaming charges when a study was carried out in 2005 by the General Secretariat of the Arab Council of Telecom Ministers. That study found out that in comparison with national call rates, Arab roamers were paying a price that was 15-500% higher for a local call terminated on a fixed network and between 15% and 700% for a local call terminated on a mobile network within the visited country.¹⁹ For making an international call, the roamer would pay a price that is higher by between 5% and 180% in comparison with local subscribers.

As a result, of the observed high prices, the Arab Regulators Network (AREGNET) was tasked with co-ordinating efforts to alleviate the excessive prices identified in the interest of subscribers roaming across the Arab region. In consideration of the number of countries and the differing market

characteristics in each, the proposed model developed wholesale roaming tariffs that are based on retail prices of similar calls in each country.

The proposal put forward in a Memorandum of Understanding (MoU) was for a three-year sliding scale with a formula that allowed for IOTs that were 1.5, 1.4, and 1.3 times of respective retail prices.²⁰ A 30% retail roaming mark-up was then to be added on top to derive the retail price. Specifically, Annex II of the MoU reached set out two formulas for the calculation of roaming tariffs at the retail and wholesale levels.

Figure 3. Wholesale roaming formula

$$WR_{vo}^{International} = RT_{vo}^{International} \times x$$

$WR_{vo}^{International}$ = Wholesale rate charged by the visited operator to the home provider for the international outgoing regulated roaming calls to a specific destination made by users of the home operator

$RT_{vo}^{International}$ = Retail tariff charged by the visited operator to its users for international calls to that destination

x = Multiplier, which shall be equal to:

a) 1.5 – for the first 12 months from the date this Annex enters into force between the respective Parties;

b) 1.4 – for the second 12 months from the date this Annex enters into force between the respective Parties;

Source: AREGNET

Figure 4: Retail roaming tariff formula

$$RT_{hp}^{International} = WR_{vo}^{International} \times 1.3$$

$RT_{hp}^{International}$ = Retail tariff charged by the home provider to its users for the international outgoing regulated roaming calls to a specific destination

Source: AREGNET

Certain commentators have queried whether there was an adequate legal basis for all AREGNET members to impose the different controls set out in the MoU.²¹ It was open, however, to regulators who did not have a legal basis to impose price regulation to opt-out of those provisions, so long as they worked towards creating a mechanism to impose price controls in the future. In any event, the proposed measures could not be agreed upon at the AREGNET level. This may be because the AREGNET measures were presented as being in the context of large differences between countries with operators that were net senders or receivers of roaming traffic, as opposed to the overall economic and social effects that may have

resulted from its adoption. The latter reasons for such an intervention were cited by the Gulf Countries (or Gulf Cooperation Council – GCC) when they took up this question.

The GCC Initiative

While some individual members of AREGNET sought to take unilateral action by forcing domestic operators to be more transparent in publishing information and capping retail prices, at a maximum mark-up over IOT, it was concluded that internationally co-ordinated regulation was the appropriate way forward.²²

A subgroup of AREGNET, the GCC agreed to pursue the development of the co-ordinated regulatory framework for international roaming prices in an attempt to manage downwards roaming prices within their economic area.²³ The GCC had already established a common economic area and had a series of rules and trade agreements already in place. In order to further refine the AREGNET proposal, a further protocol to the AREGNET MoU was developed which set ‘x’ in the AREGNET wholesale formula above to 0.85 only for GCC member countries.²⁴ That amendment was made so as to achieve a retail tariff for international roaming calls that does not exceed the retail tariff for international calls by more than 15% as mandated by the Arabian Gulf Cooperation Council while at the same time respecting the AREGNET MoU, which allows a 30% mark-up on top of wholesale rates for retail roaming tariffs.²⁵

The GCC felt that based on their own studies and work of the International Telecommunications Union (ITU) that there was no question of the resulting prices being below operator costs. A comparison can be made of the rates before and after the regulation on some GCC networks (Table 3).

Table 3. Oman Mobile and Nawras GCC international roaming rates comparison, USD *

Oman Mobile Roaming Prices	June 2010 (R.O/min)		1st Feb 2012 (R.O/min)		Reduction%	Reduction%
Visited country /network	Local call	International call to GCC while roaming	Local call *	International call to GCC while roaming*	Local call *	International call to GCC while roaming*
UAE - du	1.01	1.21	0.27	0.66	-73%	-45%
Bahrain - zain	1.12	1.42	0.27	0.66	-75%	-54%
KSA - all networks	1.15	1.79	0.27	0.66	-76%	-58%
Qatar- Qtel	1.23	1.61	0.27	0.66	-78%	-59%
Kuwait - Watinya	1.13	1.58	0.27	0.66	-76%	-58%
Nawras Roaming Prices	June 2010 (R.O/min)		1 Feb. 2012 (R.O/min)		Reduction%	Reduction%
Visited country /network	Local call	International call to GCC while roaming	Local call *	International call to GCC while roaming*	Local call *	International call to GCC while roaming*
UAE - du	0.943	1.13	0.27	0.66	-71%	-41%
Bahrain - zain	0.57	0.73	0.27	0.66	-52%	-10%
KSA - zain	1.07	1.47	0.27	0.66	-74%	-55%
Qatar- Qtel	0.26	0.52	0.27	0.66	price already below the cap	
Kuwait - zain	1.06	1.49	0.27	0.66	-74%	-56%

* Price cap rates - some rates are below the caps on competitive initiative of the operators - available on operators' websites

Source: TRA (Oman's regulatory authority).

The GCC agreement is to date the most comprehensive intervention in roaming markets after the European Union regulations. Like these, it is based on a pre-existing economic area with strong ties and economic integration. It has also adopted a clear policy for establishing retail and wholesale caps, as these are based on existing retail tariffs and established mark-ups on top of these tariffs. Current caps may still be considered by some as too high given the underlying costs.

The AREGNET/GCC MoU also contains a provision that any given country joining the agreement must have the necessary legal instruments in place to implement the MoU provisions, as well as a procedure to withdraw from the MoU, for third countries to adhere to it, and that it does not preclude stricter regulation. In order to implement these provisions, the agreement has some obligation regarding information exchange.

Following the regulation of mobile telephony, the GCC regulators are considering the increasing importance of mobile data services in their region and the GCC roaming working group is currently studying SMS, MMS and data roaming charges with a view to developing an appropriate price cap regulation for these services.

Russia-Poland and Russia-Finland

The Russian government sought to include Russia in the European Union roaming agreement area as a means to address the very high prices paid by its mobile roamers when abroad. When little progress was made on a broad European Union-Russia agreement, attention focussed on establishing an agreement between Russia's operators and operators in selected European Union countries.²⁶

The agreement that was sought, initially took the form of a MoU between the operators, which was brokered by the respective Ministries, in Russia and other countries, in order to agree to negotiate prices with a view to reaching an agreement on lower wholesale and retail prices. The overall ambition was to lower wholesale and retail prices to the European Union level as a benchmark.

Being close neighbours, the Russia-Poland and Russia-Finland are busy routes for international mobile roaming. In early 2011, the Russian Ministry of Communications and Mass Media sent a letter to the Polish Ministry of Infrastructure (now the Ministry of Administration and Digitalization) with a draft of the MoU. This draft MoU was then delivered to mobile operators via the national telecommunication industry organisations. There was then a dedicated meeting with both ministries, the four Russian operators and the four Polish operators where the MoU was presented. Two Polish operators agreed to sign the draft MoU at that meeting (P4 and Polkomtel while T-mobile and Orange agreed later). A month after the meeting the Polish Ministry went to Moscow and signed the final paper with the Russian Ministry. The MoU was then brought to Poland and another month later was officially signed by all Polish operators.

The MoU which was signed by all parties except the Russian operators is no longer valid and expired at the end of 2011. In any event, although the MoU in Poland was signed by both ministries and all Polish operators it would appear that the Russian Ministry did not have a legal basis to compel participation by their operators and no Russian operator was apparently prepared to sign it on its own merits.

In February and March 2011, Finland's Minister of Communications and the Russian Minister of Communications and Mass Media, agreed that negotiations between the two countries on lowering roaming charges on mobile networks were to be initiated immediately and this was followed by a MoU.

Although the initiatives came from Russia, the lack of a mechanism to compel participation, on the Russian operator's side, appears to have forestalled further progress because, as previously noted, participation by all countries in any particular agreement would appear to be a prerequisite. This

experience suggests that unless there is a mechanism to compel operators to implement price controls that they will not do so willingly. The 2009 OECD report on international mobile roaming found that Russian operators had some of the highest IOTs, of any country in the world, with operators in countries such as Australia and Turkey, and this may explain the reluctance of Russian operators to negotiate lower IOTs.

ASEAN countries including Singapore/Malaysia

The Association of Southeast Asian Nations (ASEAN) Ministers for Communications have been working towards a goal of a roaming policy that allows for no additional charges to be paid by users when they roam across the borders of the ten-member-country group.

In their Joint Ministerial Statement of the 11th ASEAN Telecommunications and IT Ministers Meeting and its related meeting with external parties in Myanmar, on 9 December 2011, it was reported:

- The Ministers welcomed the adoption of the Addendum on ATRC Intra-ASEAN Mobile Roaming Rates (MRR) to the Record of Intent (ROI), by the 17th ASEAN Telecommunication Regulators Council (ATRC), as a critical step of ASEAN Member States to reduce international mobile roaming charges. The Ministers encouraged all parties, especially the policy making and regulatory bodies, to consider this initiative seriously and to implement the Addendum as soon as they are ready.
- The Ministers noted that bilateral arrangements on international mobile roaming charges have been implemented or are in the progress of implementation between several ASEAN Member States, i.e. Malaysia-Singapore, Brunei Darussalam-Malaysia and Brunei Darussalam-Singapore, and encouraged other Member States to take a proactive consideration in joining this effort.

The first ASEAN countries in moving to reach and implement an agreement on IMR are Malaysia and Singapore. The telecommunication regulators in both countries, the Infocomm Development Authority of Singapore (IDA) and the Malaysian Communications and Multimedia Commission (MCMC) worked closely to study the rates charged by mobile operators to better understand the prevailing industry practice and charging model.

In March 2011 the IDA required that operators provide consumers with the option of a premium rate service (PRS) barring function which will be free when activated for the first time. Operators were also required to give consumers the option of limiting their data roaming usage in a monthly billing cycle together with a host of other transparency measures.²⁷ However, as mobile roaming charges involve different price components charged by operators from both countries, it was recognised that any study of and regulatory requirement to reduce roaming charges required co-ordination and co-operation between both regulators to ensure that users from both countries benefit from any decision to intervene in the market. That study of charging practices found that prices were well above costs and that a series of wholesale and retail price controls would be appropriate. Singapore and Malaysia concluded discussions to progressively reduce bilateral roaming rates.

The IDA worked closely with their counterparts in Malaysia's MCMC as well as the mobile operators in Singapore to bring about these reduced roaming rates. From 1 May 2011, Singapore and Malaysia mobile phone subscribers saw price reductions of up to 30% for voice calls and 50% for SMS, when they use the mobile roaming service provided by all mobile operators in Malaysia and Singapore respectively. The price reductions were implemented by mobile operators over two phases, for both prepaid and postpaid subscribers. Both the wholesale inter-operator charges and the retail subscriber charges were reduced to affect the lowered prices. With regard to the pricing of roaming data service, MMS and video

calls, both regulators are currently studying charges for these services and reviewing the appropriate actions.

The legal basis is an agreement signed between IDA and MCMC (Singaporean and Malaysian regulatory authorities) in order to bring roaming prices down. The details of the agreement have not been made public although some information has been disclosed.²⁸

Table 4. Singapore to Malaysia retail roaming rates 2011-2012, USD

Singaporeans travelling to Malaysia	1 January 2011	From 1 May 2011	From 1 May 2012
Receiving an incoming call	0.56-0.80	0.45-0.64	0.39-0.56
Call to a Malaysian number	0.40	0.32	0.28
Call to a Singapore number	0.47	0.41	0.37
SMS	0.48-0.49	0.33-0.42	0.24-0.25

Source: IDA (Axiata elaboration)

Table 5. Malaysia to Singapore retail roaming rates 2011-2012

Malaysians travelling to Singapore	1 January 2011	From 1 May 2011	From 1 May 2012
Receiving an incoming call	0.65-0.81	0.52-0.65	0.45-0.24
Call to Singapore number	0.57-0.78	0.45-0.62	0.40-0.55
Call to a Malaysian number	1.27-1.57	1.01-1.26	0.89-1.10
SMS	0.32	0.23	0.16

Source: MCMC (Axiata elaboration)

South African Region CRASA/SADC Home and Away Roaming

CRASA, formerly TRASA, is a forum of communications regulators in Southern Africa and incorporates all other ICT Stakeholders.²⁹ It was established in 1997 under the SADC Protocol on Transport, Communications and Meteorology and has among its goals to: *i)* attain regional integration and development goals; *ii)* achieve economic growth; *iii)* accelerate poverty reduction and *iv)* achieve sustainable development.

In particular the SADC wants to enhance regulation and promote regulatory harmonisation as a means to promote investment in the sector, promote regional integration and to promote universal network development and universal access to ICT services. The high cost of international roaming was identified as a particular area of concern and a Regional Alliance Task Team (RATT) was set up to investigate ways of reducing the high cost of international roaming.

That first study was completed in 2010 and the outcomes were in the areas of transparency and consumer protection measures. Specifically measures implemented were:

- SMS sent by home network (operator initiated) providing tariffs for calls to and calls received from networks of the operators of the relevant country;

- Provision of roaming retail tariff information to customers through the operators' websites;
- Provision of comparable information on roaming retail tariff by NRAs websites regarding their respective operators;
- Submission of roaming retail tariff information by NRAs to CRASA Secretariat to allow for CRASA to publish the information on its website;
- Setting of bill limits and notifications.

A second study is now underway in all CRASA member states with RATT commissioning work which is examining the underlying costs of SADC regional roaming services and the possible development of a harmonisation policy framework for the SADC Home and Away Project. The resulting framework is considering the potential legal or regulatory framework necessary to harmonise ICT services.

Regional co-operation among regulators is felt to be the likely route to take if the conclusion is to seek to encourage cost-oriented international mobile roaming prices. It is also expected that the regulators can promote economic efficiency and encourage competition in the international mobile roaming market and allow market forces to come into play. The expectation is that if regulators do set ceiling prices for international mobile roaming, then this would be done in the least intrusive manner.

It has been noted that for some operators and countries in the region, that international mobile roaming is a source of foreign currency. There are some operators that experience significant net inbound and net outbound roaming balances (for example Mauritius and the Seychelles are notable holiday destinations). It has also been suggested that the effects on postpaid and prepaid subscribers may be different and need to be taken account of as well as operator's ability to implement certain solutions (e.g. on-net roaming without additional charges was pioneered in Africa).

South America

In Brazil, the Ministry of Communications, which deals with policy formation, and the national regulator ANATEL, which deals with the implementation of that policy, have noted that prices are high and an agreement between operators and the regulator to lower prices would be desirable.³⁰ While certain activities have had a positive effect such as the introduction of day rate packages for travellers to the European Union and North America, the cost of international mobile roaming is still greatly in excess of domestic charges.

An initiative is underway within MERCOSUR, which seeks to address the issue of roaming in border areas between members. The MERCOSUR member states are Argentina, Brazil, Paraguay, Uruguay and Venezuela and the 2010 Citizenship Statute has the objective to consolidate rights and benefits for the citizens of these countries. At the moment, there are about 15 million people living in these border areas and they are generally from low-income groups in remote regions. Nevertheless, there is intense cross border movement of people with a certain level of commercial integration, and roaming, in particular inadvertent roaming, is an identified problem to be addressed.

A chapter on communications in the 2010 Citizenship Statute promotes price reduction for fixed and mobile communications among MERCOSUR member states and this includes roaming services. The ambition is to extend Resolution 66/97, which requires that fixed service calls in border areas are charged as "local calls" even if the calls are established between two cities from different countries. The "charge as a local call" rule for wireless telecommunications in border areas is hoped to be achieved mostly by

network infrastructure sharing. The limitation in the fixed call context is that the connections must be located less than 50 km away in a straight line.

The work regarding mobile services in border areas is in progress to apply a similar rule to that which has been affected for fixed networks. The work underway has focused on providing more information to consumers with inadvertent roaming being a particular target. While specific countries in South America, have not imposed price controls, there have been agreements regarding transparency measures such as the agreement between companies and ANATEL in Brazil to have an SMS giving information to roamers on arrival in a different country.

Other developments

A number of other roaming initiatives and developments are also worth noting. Some regions have effectively eliminated roaming on certain bilateral routes. However, such developments are normally the result of a combination of deep regional economic integration and a significant degree of operator integration across borders.

Certain areas within Europe, for example in the Scandinavian region, have a range of operators that offer certain routes included in the basic packages. In other instances, operators with a relatively low market share, Hutchinson's 3 Group for example, introduced a package with domestic rates where the subscriber stays on the relevant 3 Group network.³¹

Elsewhere, mainland China operators have co-operated with operators in Hong Kong, China, Macao and Chinese Taipei to lower roaming service tariffs. The solution implemented sees a technical solution such that one SIM card hosts two numbers that allow consumers to appear as local customers who can opt for a daily or weekly price plan.

Finally, the Chinese Ministry of Industry and Information Technology, has pointed to substantial reductions in wholesale prices they say operators, such as China Mobile, have been able to negotiate with mobile operators around the world including in many OECD countries.³² Among the least expensive countries for roamers from China to visit and make local calls, receive calls and make calls, to and from China, are certain operators in Korea, Singapore and the United States. A China Mobile roamer on T-Mobile's network, in the United States, for example, has seen retail price reductions of 92% between 2009 and 2011. As a result it is now less expensive for roamers from China to make calls in some OECD countries at less expensive rates than for local users.

On the other hand, for customers roaming in China, there have been little or no reductions from mobile operators in OECD countries, suggesting the benefits of lower wholesale rates between these operators and those from China are not being passed on to users. This means roamers from China have a significant advantage over those from OECD countries in terms of the use of mobile services to facilitate trade and travel (see Annex for a comparison of bilateral routes between China and selected OECD countries).

The Chinese Ministry has said, in March 2012, that it is willing to work together with WTO members and related organisations to promote the lowering of international mobile tariffs. One factor that may need to be noted in China is the beneficial ownership share of the Government in all mobile operators. At the same time, a question that many policy makers and regulatory authorities could ask, in OECD countries, is why lower wholesale rates that are being enjoyed by operators are not being passed on to the market in OECD countries?

Best practices for international roaming agreements

Legal instruments to be used

Policy makers, or a national regulator, need to take into account that the retail price for roaming services while abroad and imposed on its consumers by its national operators is highly dependent on the wholesale prices imposed by operators outside its jurisdiction. If policy makers choose to control prices, a high level of co-operation between two or more countries is required given this structure of the market and the interplay of wholesale and retail transactions in different countries.

The payments resulting from wholesale roaming charges can be relatively low in cases where traffic is very balanced between inbound and outbound, where one or more operators has a high degree of countervailing buyer power or where operators are under common ownership across countries. Even in such circumstances, it is clear that retail roaming prices remain high. This suggests that increasing awareness of roaming substitutes, of pricing and pricing options can help to educate consumers. Such measures have been shown to increase awareness when in place and it has been noted that this in turn can raise the price elasticity of demand. This is in contrast to the claims of some operators arguing that wholesale charges represent a major barrier to lowering retail roaming prices.

Transparency regarding roaming services is important as it raises awareness and can give consumers greater control. Stimulating awareness can increase consumer price sensitivity, which in turn can put pressure on suppliers to react. Although some regions have had price transparency measures in place for some time, however, the evidence continues to suggest that price elasticity of demand for roaming voice and SMS services remains low although this may not be the case in respect of data roaming. A lack of transparency regarding roaming data pricing in particular has resulted in some very significant instances of consumers spending more on international mobile roaming services than anticipated.³³

Nevertheless, transparency is a fundamental requirement for consumers and it has also been observed that even with reductions in pricing for roaming services, lingering perceptions that roaming services are expensive can persist and need to be addressed. Various transparency measures have been adopted though when imposed on a voluntary basis the level of compliance and effectiveness of these measures has arguably been very limited. Transparency measures which have been imposed by regulators have been much more effective. In general such measures require a home network to send an SMS to their customers on arrival in a foreign country specifying the various charges that apply for roaming services. Such measures are sometimes complemented with additional measures that set safeguard limits to protect consumers from bill-shock.

Policy makers and national regulators have the ability to act unilaterally to impose measures that assure transparency of pricing for end-users. Surveys conducted by individual regulators have generally found that awareness is lower for pre-paid than for post-paid customers in the absence of specific transparency measures. Such measures can be imposed on the basis of a regulation issued by the national regulator as was the case in Oman or may be imposed as part of a national consumer legislation or as part of a broader roaming agreement as in the European Union regulation.

Consumer protection measures such as cut-off limits tend to rely on parallel legislative measures and the purpose is to provide a basic safety net for consumers so as to avoid bill shock.

It is an open question as to the extent to which voluntary agreements amongst operators, governments and regulators could serve the purpose of achieving a more reasonable level of roaming charges. Measures have been widely introduced which address issues of consumer transparency but such interventions are uniquely capable of being implemented unilaterally by regulators to protect their consumers.

An observation from the preceding analysis is that the incentive structure differs considerably for both operators and regulators depending on the specific circumstances of a bilateral or multilateral grouping. Larger operators who can balance traffic have a far greater capacity to lower their net wholesale costs in reality. Smaller operators have, and do offer, more attractive wholesale rates in order to win marginal traffic but tend to win international traffic in approximate proportion to their national market share. Larger operators are therefore in a position to determine the market price for most of the traded traffic even if unbalanced traffic is negotiated separately to balanced traffic. Such operators could accept wholesale price reductions without impacting their profit margin. The evidence to date however suggests that though declining, the charges continue to remain considerably in excess of cost for most services.

In the event that there is considerable cross ownership of operators on specific routes or in the event that traffic is broadly balanced between operators, then those factors would tend towards the feasibility of a voluntary intervention. However, any intervention at the wholesale level, whether voluntary or not, does not imply a feed through change at the retail level. Again, for certain operators the charges in question may be illusory since costs may net off to a considerable extent. Even in such circumstances high retail prices can be observed which suggests that unless there are some special circumstances such as a new entrant operator in two countries, where bilateral travel is significant and is seeking to acquire customers, then a price charge is likely to be appropriate.

The evidence in this regard is mixed. Parallels with AT&T's One-rate in the United States market or indeed 3-Group in Europe, suggest that smaller operators with low wholesale roaming charges may seek to use innovative roaming offers to acquire customers. Where MVNOs have a position in a market they would also be expected to use lower wholesale roaming charges to acquire customers at the retail level. As noted by BEREC, however, the low elasticity of demand for voice and SMS services may mitigate against such a strategy. Nevertheless, regulatory principles which recognise the value of competition across as much of the value chain as possible would suggest that wholesale regulation should be tested in advance of the imposition of retail price controls. There is a plausible, albeit untested, rationale which suggests wholesale regulation could be effective by itself particularly where the retail market is more contestable.

A more challenging issue may be the differing perceptions of policy makers. International roaming differs from other telecommunications services in that the wholesale and downstream retail markets are always in different countries. If an operator in country A wishes to offer its customers the ability to roam in country B, it purchases a wholesale service from an operator based in country B, but sells it as a retail service in country A. It is for this reason that regulators are not in a position to tackle roaming at a national level except to address certain transparency issues for their own consumers.

In some countries, however, regulators have the ability to regulate wholesale and retail roaming markets but, in some cases, it is the motivation – benefiting local consumers – that may be lacking to require action. To this extent, bilateral roaming agreements will play the role of catalysing action by regulators, as well as ensuring co-ordination with their counterparts in other countries, although this may not be strictly necessary to regulate roaming prices (that was believed to be the case in the European Union prior to the roaming regulations).

Those policy makers whose operators are significant net recipients of roaming revenues may assess the balance between consumer losses and producer surpluses especially where public revenue itself, may be a significant beneficiary. These circumstances may be a consideration outside the OECD area, where international mobile roaming results in hard currency receipts or where such revenues are significant in a particular national context. Similar arguments were made in the past in relation to the accounting rate system for international telephony. They do not take into account the much broader benefits and implications for trade and travel for economic and social development.

Nevertheless, experience shows that co-ordination is already difficult even where such factors are neutral. Factors such as the allocation of resources, the timing of such allocation, the setting of priorities and the complicated nature of the market and particularly pricing assessments create challenges in themselves. Where countries have operators that are significant net beneficiaries of roaming revenues, then roaming losses to domestic consumers may be more than offset by gains to producers from a narrow perspective. Where such factors arise, the implicit imbalance between network operators may not be a priority for one of the countries involved, which implies that co-ordination with other countries will be more difficult.

Provided that both (or all) countries can agree that there should be an intervention on prices (setting of price caps for example) then the question arises as to what legal instrument can or should be used. Unless each country involved in an initiative is in a position to impose a price control then no other party is likely to agree to act unilaterally on that route. Often a country's ability to impose a price control will be limited to specific instances of market failure which will likely fall outside a framework that can be used for international mobile roaming.

Finally, countries unsure to have the legal instruments to regulate retail roaming charges may agree to sign a Memorandum of Understanding (MoU) involving the industry, if possible, to achieve a more reasonable level of roaming prices. Given that the industry's reaction may not be very positive, that country could link future reductions of roaming prices to broader telecommunications policy areas, so that the case is more compelling for the industry. This lacking of legal instruments for implementing price regulation is relatively rare in the OECD area.

A more general trade agreement (*e.g.* via an addition or existing use of an FTA) could form the basis for a legal framework to impose obligations in the context of a broader multi-party agreement. This might be the appropriate mechanism to make such an intervention.

Trade issues – The WTO Framework and MFN

The WTO provisions, namely the General Agreement for Trade in Service (GATS) provide a framework that contains the countries' level of commitments regarding market access and national treatment for selected services. Some of the GATS provisions are applicable to telecommunication services, such as the Annex on Telecommunications or some stances of the Reference Paper, only with respect to countries who have undertaken relevant commitments in their schedules. Others, such the Most-Favoured Nation (MFN) principle, are applicable irrespective of whether commitments have been taken.

As summarised in previous OECD work, international mobile roaming services are believed to fall under the scope of these provisions. And more clearly so under section 5 a) of the Annex on Telecommunications, which could imply that access to and use of public telecommunications and services should be granted to foreign providers on reasonable and non-discriminatory terms, which could be applied to wholesale roaming services. While it is unclear how these provisions could be effectively enforced, there seems to be a certain degree of consensus that wholesale roaming prices are far from reasonable and would eventually enter into conflict with some interpretations of the Annex on Telecommunications. A similar argument could be made about the Reference Paper, even though the connection may be less clear, as the existence of dominance (or of "major suppliers" in the WTO terminology) would be a prerequisite.

The MFN principle means, in essence, that countries should not discriminate among the services and services suppliers of other members, so that any country granting more favourable conditions to another country should extend this more favourable treatment to third countries. The MFN principle may be waived in some cases, such as the existence of a Free Trade Agreement (FTA) between two countries with sufficient coverage.

With respect to roaming services it is clear that wholesale roaming rates charged are far from being reasonable or non-discriminatory, although to date no formal case has been brought to the WTO, probably due to the fact that cases are usually raised as a result of concerns expressed by the industry.

Some have stated that the MFN principle would not allow for any bi- or multi-lateral agreement on international mobile roaming services. This report argues that the WTO contains sufficient instruments, such as the FTA exception, which provide for the possibility of establishing IMRs. Moreover, this report also considers that current high wholesale roaming charges may not be in compliance with the provisions of the Annex on Telecommunications. Therefore, any increasing attention given to the role and applicability of the GATS to roaming services would highlight these issues and in the end contribute to lowering wholesale roaming charges. This is in line with the reasoning set out in previous OECD work. Moreover, it has been discussed at the WTO level, in particular the applicability of the WTO provision to roaming services (OECD, 2009).

Price regulation principles

The question arises as to where price caps or other types of price regulation should be imposed. The fact is that today operators with large footprints and operators whose traffic is more or less in balance have no constraint on their retail behaviours coming from wholesale price constraints because those costs are largely accounting ones rather than actual costs.³⁴ On the other hand, operators with significant traffic imbalances do actually face cost constraints at the wholesale level as described above. Those operators facing large traffic imbalances will benefit on the other hand by wholesale price controls.

In certain markets the balancing of traffic between roaming operators means that in practice it is only the marginal traffic which actually affects the operator's wholesale revenues. In such cases this has led to the practice of treating balanced and unbalanced traffic separately even in the presence of a wholesale price control. Balanced traffic is exchanged at a rate (determined by policy makers where available or set bilaterally where it is not) and unbalanced traffic is normally then negotiated at a significantly lower rate. In a sense the rate of balanced traffic shouldn't matter *per se* since resulting monetary transfers will be zero. It has been estimated that roaming traffic within Europe is likely to result in up to 50% of traffic being balanced off and where such balancing takes place, it takes place at the regulated rates. For example, BEREC in a review of roaming in the 27 countries of the European Union noted that:

*“It has been suggested that the data collected by BEREC on wholesale prices is misleading as it aggregates deals for both balanced and unbalanced traffic. The argument goes that the average for unbalanced traffic would be considerably lower, demonstrating greater intensity of competition on price than had previously been considered to be the case, for that residual traffic. Meanwhile, the rest (balanced traffic) is simply swapped so that any revenues and volumes net out. BEREC statistics on wholesale prices already exclude intra-group traffic which should reduce any such inaccuracy”.*³⁵

One study for the European Commission made a similar observation with respect to the IOT negotiation dynamic: “...the rate that really matters, then, is the IOT rate for *unbalanced* or excess minutes (which, we are reliably informed [as further explained later in this section], is *different from and lower than the rate for balanced minutes*);”

Furthermore, the data from Europe suggests that these negotiations for unbalanced traffic can lead to a blended rate that is lower on average than the regulated rates (but nevertheless tends to follow the regulated rates very loosely) as shown in Figure 5.

Figure 5. Wholesale price cap versus average prices, EUR



Source: BEREC

It needs to be noted that on any country pair, the largest operators may be able to balance off all their traffic, albeit even if it is with multiple partners at least on one leg. Such an operator(s) has considerable freedom to set any price it wishes on the retail roaming market if it chooses to. While not all operators are in a position to make such an offer (one or more), it raises the question as to why they do not due to competition dynamics that apply in domestic markets.

The question goes to the very heart of the retail pricing issue. The decision about whether or not to regulate an outcome of lower retail roaming prices relies not only on costs but also the extent to which additional sales will accrue and broader benefits for economic and social development. Any change in customer usage patterns and any associated increase in ARPU will of course depend on the level of customer's price sensitivity.³⁶ If on the other hand there is price elasticity of demand then it would be expected that reduced wholesale prices should find their way through to the retail level without any policy intervention.

Another factor that needs to be considered is what the relevant product or service market is in this context. While the evidence pointing to a low price elasticity of demand is strong, that may in one sense be the wrong metric. In certain instances operators offered very low rates or eliminated roaming surcharges altogether in order to win retail subscribers (as opposed to roaming service clients). However, operators that have the biggest incentive to win retail clients are smaller operators but are precisely those operators with the least ability to put very low prices into the market. This is because they face a strong wholesale pricing constraint. The evidence thus far suggests that the retail price elasticity of demand is relatively low and that offers that involve features such as flat rates generally valued by some users may not necessarily drive customer acquisition for operators willing to absorb residual wholesale costs (BEREC 2010). It remains to be seen the extent to which wholesale price controls would feed through to the retail level.

A competitive wholesale market (or pricing which mimics those outcomes) is a necessary, but not necessarily a sufficient condition for competitive retail market outcomes. Unless there is some market dynamic which could encourage wholesale price reductions to be fed through to the retail level, then wholesale regulation on its own may not be effective. One such dynamic may result from MVNOs having

more flexible access to regulated wholesale rates which enable them to lower prices or provide a greater range of pricing options.

It does appear as though smaller operators may have an incentive to offer better packages and lower wholesale pricing may facilitate that outcome. However, there is little experience of wholesale pricing interventions that were not accompanied by retail price interventions at the same time so it is not easy to observe from practice. For example, the price regulation in the European Union allows for a wider retail margin so that, together with structural measures, competitive dynamics at the retail level could arise.

Clearly, interventions at the retail level deliver benefits to consumers more quickly but, on the longer term, the structure of the market needs to be addressed if countries want to see some degree of competition in roaming markets. Some alternative structural measures for pushing wholesale price reductions through to the retail level might be considered and these are discussed below.

Allowing time for wholesale charges, together with structural measures, to work through to the retail level or to determine their efficacy has not been employed by any regulator to date. Though untested there are many reasons to propose this course of action, not least of which is the difficulty in withdrawing retail price regulation once imposed.

Retail price regulation is very much a second best solution which may limit the scope for a more creative dynamic if appropriate wholesale controls are in place. If, however, wholesale price controls are not sufficient by themselves to work through to the retail level then retail price controls will be required in order to ensure consumers benefit from lower roaming charges. One of the principal problems with retail price controls is that it can act as a focal point for charges to coalesce around (as shown in figure 5 above). According to some interpretations, there is some evidence that this is what has happened in Europe, while others point to the lack of competition at the retail level, as prices stay at levels close to the cap. In any case, setting high retail price controls in the expectation that some forms of competitive entry may happen may therefore backfire if entry does not occur.

Setting charge controls.

If price controls, at the wholesale level or the retail level, are imposed by regulatory authorities a number of methodologies can be considered. These options range from benchmarking to strict price controls with a series of options in between.

In respect of voice call services regulators often have cost models at their disposal which have been generated for setting voice call termination. The European Union used the simple logic in respect of their original regulation (Regulation 2007/717) that two times termination plus some mark up for transit would guarantee cost recovery for operators:

“The most appropriate benchmark for call origination and for call termination is the average mobile termination rate for mobile network operators in the Community, based on information provided by the national regulatory authorities and published by the Commission. The maximum average per-minute charge established by this Regulation should therefore be determined taking into account the average mobile termination rate, which offers a benchmark for the costs involved.”

It can be noted, however, that since 2007 the European Union has moved to a ‘pure LRIC’ model of cost recovery for mobile termination rates (MTR) so such a benchmark would no longer hold. Wholesale costs have been further refined by estimates generated by BEREC, most recently in reference to the latest European Union roaming regulations where upper-bound estimates of cost were refined in reference to the negotiations on the next round of roaming regulation in Europe.³⁷ Those costs were estimated using

information gathered from individual European Union regulators but the exercise does not seek to identify a precise cost point but rather cost points where there is a high degree of comfort that prices are not below costs.

BEREC has taken the position that the additional costs of roaming such as transit and billing for example to be small. Therefore the 'costs' for roaming will approximate termination rates for call out (plus transit) and origination costs for in-country traffic (hence the 2 x termination logic of the Commission's original proposal). National roaming rates (if available or known) could give a good proxy for origination charges. All of these examples avoid a strict decision on the allocation of joint and common cost considerations for roaming which would be non trivial.

Another possibility could be to use the unbalanced traffic rate between operators as a price point which might mimic a competitive outcome and which have been noted to be lower than the rate for balanced traffic. Even in the presence of regulation, it has been noted that balanced traffic is simply swapped at the regulated rate whilst lower rates are negotiated for non-balanced traffic (WIK 2009, BEREC 2010a).

A question also arises whether greater transparency regarding the level of pricing at wholesale levels could by itself also act as a downward pressure on operator's charging even in the absence of strict price controls. While the gap between wholesale and retail prices can be very large, such information may not reveal the 'actual rate' if it is the headline rate and does not take into account the balance of traffic. Nevertheless, such transparency is likely to signal opportunities for market entry where it is possible. Concerns may exist regarding collusive outcomes and regulators may need to take measures to act against these outcomes. One possibility is wholesale price benchmarks rather than individual IOTs. As stated in previous OECD work on international mobile roaming, including the OECD Council Recommendation, the publication of these benchmarks (whether IOTs or wholesale prices) should avoid parallel pricing behaviour and that incentives for individual price cutting are reduced.

AREGNET/GCC set a wholesale rate by reference to the prevailing retail rate for international calls in those countries. The mark-up suggested that this logically assures that any additional costs for roaming will be covered in the original proposal where a 50% mark-up was to be reduced over time. Even in the GCC measure which had a margin of -15%, it was assured that such a price cap would cover costs based on international benchmarks and their own estimates.

Previous OECD work has noted that international calls were sometimes more expensive than roaming calls back home:

“Surprisingly roaming is not always more expensive than making international calls from mobile phones. This report argues that this is because MNOs and MVNOs believe that users making international calls from their mobile phones have inelastic demand. This means, on some routes, it can sometimes be less expensive for users from Japan, Korea, Mexico and Switzerland to make calls home when roaming than it is for nationals of countries in which they are roaming to make international calls to these countries” (OECD, 2009).

One mitigating factor against the use of mechanisms which use domestic prices as a reference point for wholesale roaming IOTs and retail charges which are a function of those IOTs is that it will result in a series of different roaming charges within a given roaming area. An agreed roaming charge at the wholesale level whether with retail charges or not, has the advantage of being easily communicated on a number of routes.

To date, retail price controls have universally been set by reference to the wholesale charge. Such mark ups have ranged from 15-30% in the case of the AREGNET/GCC initiative to over 60% for an outbound call in the European Union roaming regulation I and II.³⁸ It has also been the case that some commercial operators have set 30% as the mark-up for commercially negotiated IOTs.

It is noteworthy that no regulator has applied anything more than a broad price control which uses available data for other services to approximate rates which can be certain to cover operator costs at the wholesale level while adding a mark-up to obtain the retail price charge. Such an approach may be appropriate in the context of significant complexity regarding the allocation of costs across a range of services where significant joint and common costs would need to be allocated. The allocation of such costs will need to be allocated to be greater or lesser extent, on a discretionary basis by regulators. Such an approach is appropriate in that it brings down prices to a reasonable level without the need for a very complex costing analysis. Given that two countries entering into an IMR agreement may have larger differences in cost accounting methodologies than operators in the same country, this approach is aimed at facilitating this work, so that cost accounting issues are not a major hurdle in achieving agreements.

Implications for the development of competition

It may be that wholesale price charges could be passed through to the retail level without any need for retail price controls. If consumers exhibited greater levels of price sensitivity then the operators themselves are likely to push through the price reductions. However, there has been limited evidence that consumers are price sensitive in their initial selection of operators. It is, of course, possible that operators could push through retail price reductions or other options in order to acquire subscribers. AT&T introducing its national “One Rate” service, in the United States, is an example of an operator not being constrained by wholesale prices. This offer attracted consumers in a way that changed the market. At the same time, the various on-net offers also take advantage of being less constrained by high wholesale rate

The recent experience in China shows that business and consumers will substantially increase their use of international mobile services if operators, no longer constrained by high wholesale prices, find price levels that are attractive to users. In that country, traffic for calls received while roaming increased by 46% between 2010 and 2011, although the significant Chinese economic development has undoubtedly played a role in this increase. The conundrum for policy makers, in other countries, is why competitive dynamics have not resulted in the same reductions given that certain operators in these countries would have also experienced substantially lower wholesale rates with Chinese operators. In this respect, the public ownership of Chinese operators may have allowed for a different outcome concerning the price-setting of roaming services.

One factor in why operators are not passing on lower wholesale rates, which has been elaborated in previous work, has been the lack of contestability in roaming markets.³⁹ In normal markets, large gaps between wholesale charges and retail prices would see market entry and greater competition. Several factors have been elaborated which undermine this effect in international roaming. Beyond the obvious entry barriers of spectrum allocation and network building, particular emphasis has been placed on the inability of virtual operators to get access to wholesale roaming agreements under GSMA rules. It may be that MVNOs could drive wholesale charges through to the retail level under certain circumstances. Given the lack of size, at least initially, and the lack of returned traffic for MVNOs, their commercial negotiating power would be too weak regardless of the extent to which GSMA rules applied. The new roaming regulation may alter this dynamic in the EU (WIK 2009).

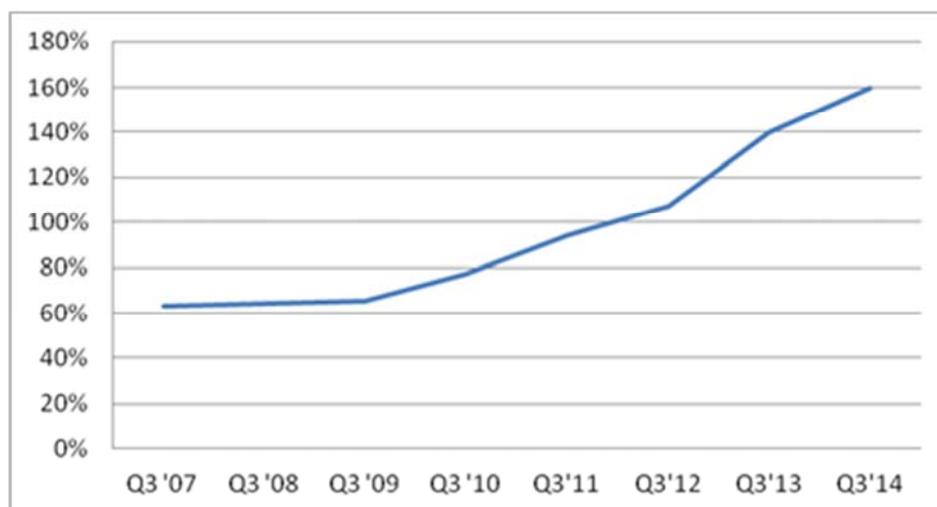
MVNOs may have strong commercial incentives to sit behind their host network in roaming agreements for a number of commercial reasons. For example, the structure of MVNOs may limit their ability to operate independently of their host network. MVNOs normally operate under the host network’s

Mobile Network Code (MNC) and therefore under their International Mobile Subscriber Identity (IMSI) range. The billing engines for roaming typically do not interrogate beyond the requirement of identifying the network operator and so they are not capable of determining such network operators. MVNOs do this for a number of reasons, they can invest significantly less in network elements but more importantly, MVNOs typically have significantly less customers than their host network and so normally benefit from their host network's buyer power with third party operators. Previous work has suggested a role for global-MVNOs and this at least would overcome the issues around capital investment and potentially the issue of a sufficiently large customer basis so as to avail of buyer power.

To date no such operator has emerged notwithstanding the obstacles in place. The EU Roaming Regulation III seeks to overcome those obstacles by mandating a right of access for MVNOs to the regulated roaming rates. Technical discussions are currently underway to ascertain means to address any technical issues regarding entry and service provision by MVNOs who seek to specifically address the roaming market. It remains to be seen whether such operators can push wholesale charges through to the retail level and so to obviate the need for retail price controls in the future. A review of the MVNO measures will be held before 30 June 2015 to determine whether price controls can be removed.⁴⁰ One important addition in the most recent roaming regulation has been to ensure a significant margin to stimulate entry by MVNOs and resellers by introducing a retail cap three times higher than the wholesale cap.

The decision to use MVNOs to increase competition in retail prices would need to be co-ordinated by countries entering into an agreement. In particular, the level of retail and wholesale pricing would need to be such that there was sufficient incentive for new service providers to enter the market. The European Union, albeit in a context where both retail and wholesale prices are subject to price controls, acted to let the relative gap between retail and wholesale price rise so as to entice entry. Looking at the gap between retail and wholesale prices in the European Union for outbound calls this can be observed below (Figure 6):

Figure 6. Gap between retail outbound voice call and regulated roaming rate in EU



Source: OECD elaboration from price cap information

In addition, the European Union has decided to grant end users the right to contract separately for domestic and roaming services. Therefore, the standard mobile contract in the future is going to have the possibility to be segmented into two contracts, one for international roaming and one for other services which should lower the barrier to entry in this market segment significantly. This will be a major structural

change for the industry and will deliver significant costs for the sector. It may be that a retail price control related to the level of wholesale charges could deliver an outcome that mimics what can be achieved by MVNOs at a lower cost.

Nevertheless, if MVNOs can help to stimulate competition, and further innovation, in the area of mobile roaming there may be broader benefits. It is not clear, for example, why the various ecosystems around some types of smartphones and tablets cannot play a role in allowing consumers to access more competitive international roaming services. One possibility, widely suggested by some commentators, is that some operators oppose such a development and may use the upfront reductions, on the sale of certain devices, associated with the sale of contracts. Over time, however, some ecosystems may be able to evolve to include international mobile roaming from purely commercial developments (*e.g.* as has occurred with Amazon's Kindle).

While there is a widespread feeling that wholesale and/or retail regulation may be needed, at least for some time, to achieve a more reasonable level of roaming prices, countries should bear in mind that no competition will surge unless the adequate incentives are put in place.

Possible structural measures

A general rule that might be considered, depending on market conditions, would be one that permits only unilateral traffic offers (which cannot be connected with traffic exchange). This would make a fundamental change to the trading process in the international roaming. This is because traffic balancing softens the emphasis on price competition and also the fact that smaller operators or MVNOs could otherwise be greatly disadvantaged (if not excluded altogether) from such negotiations.

Subject to capacity and coverage constraints it can be presumed in such circumstances that the cheapest offer would generally capture the vast majority of traffic in the market (since the return leg is now irrelevant).⁴¹ It may also encourage operators to compete in other ways such as investing in greater coverage. Moreover, for those operators that do not offer on-net roaming deals, even where they have this capability, there may be less incentive not to do so. At the moment, an operator with the best coverage in one country, and less coverage in a second country, may not wish to make an on-net offer available for a variety of reasons, such as the quality of service for their customers in the second country even though it is within the same group.

Such a price effect would be likely to oblige other operators to compete on prices offered rather than traffic traded. However, it is not clear how or if such an obligation could be imposed and cost orientated pricing is likely to achieve the same result albeit with less precision. The breaking of the link between inbound and outbound pricing has been considered in other assessments. BEREC considered that such a measure would be important if it could be verified that balanced and unbalanced traffic were treated differently which has since been verified by a number of parties.

Others have also considered that such a measure would be difficult to construct (WIK 2009). For example, it would fundamentally change how operators negotiate wholesale roaming agreements. For groups with international footprints, it could considerably complicate the way national operators exchange traffic, including how international roaming alliances operate. Clearly, this model would change the way operators negotiate with their counterparts in another country. Notwithstanding this, it has been considered by some regulators (*e.g.* BEREC), as a possible way to change market dynamics, especially for smaller players.

Alternative possible structural measures might be the facilitation of an MVNO which would enjoy countervailing buyer power. In order to achieve the necessary size, however, such an MVNO would need

to be operating beyond specific country pairs, at least at a regional level and probably globally. Any existing mobile operator can provide roaming services globally and could seek to act as a global MVNO but none has done so to date.

MVNOs are more likely to facilitate retail competition where they have access to the necessary wholesale inputs and a framework exists that allows roaming services to be bought independently of the broader mobile retail bundle of services. Unbundling of services in this way is untested and it remains to be seen how effective it will be in promoting retail competition.

A number of observers have suggested that price elasticity of demand is likely to be higher for data roaming than for voice and SMS roaming services and in such circumstances, awareness of charges is likely to drive consumer and operator behaviour to a greater extent than for services such as voice and SMS where elasticity of demand is lower. In particular, the possibilities for substitution for data services by using Wi-Fi networks or hubbing.

In addition, there are fewer constraints, due to not needing telephone numbers, for international mobile roaming with devices such as tablets and users purchasing a local SIM card can more readily substitute services such as messaging and email. While many operators charge the same rates for data roaming on smartphones, as for their stand-alone tablet offers, this may face greater pressure for consumers to seek out better deals than when they are locked in by the need to retain their telephone number. Some devices that enable dual SIM cards, work with smartphones but only if they have been “jailbroken” – something many consumers are understandably not willing to do.⁴²

Other structural measures proposed at the European Union level include Local Break Out (LBO) whereby roaming customers can switch onto the network of a local operator on the basis of a direct relationship (via credit card payment for instance) without altering the SIM card or the device. From July 2014, mobile operators in visited countries will have the possibility to directly offer data roaming services on their own networks to travellers, which consumers can select either in advance or on the spot. The European Commission says that it believes that “Mobile network operators in visited countries will have an incentive to offer such services at rates close to national prices, on the basis of their own low national network costs.”⁴³

In effect the roaming customer temporarily ceases to be a customer of its home provider and becomes a customer of the local operator for the roaming data service, while continuing to access to traditional voice and SMS roaming services supplied by its home provider. In this sense it is not really roaming but a variation on buying a local SIM but with significant potential advantages (*e.g.* avoiding the time, inconvenience and other barriers, such as language, to purchase a SIM). This option initially relates only to data services but is not mutually exclusive with a separated roaming contract, *e.g.* a consumer who takes a roaming contract with an alternative roaming operator to the domestic supplier will still be able to avail of LBO when roaming. Technical implementation and customer proposition issues are currently being worked through by European operators in conjunction with BEREC.

The unbundling of the basic service offering in Europe will be implemented, according to the Implementing Regulation, using a single IMSI solution which can be hosted on a single SIM card. It had been proposed that customers wishing to change roaming operators would change their current SIM card for a SIM card on which two IMSIs (the dual IMSI solution) would be recorded with one for the domestic operator and one for the alternative roaming provider. Such a solution ultimately fell away after a number of commentators including the regulators group of BEREC questioned the implementation costs associated with such a solution.⁴⁴ Initial estimates of costs did not include network provisioning or importantly the costs of replacing SIM cards, many of which would have needed to be upgraded. Nevertheless, the

experience of Chinese operators, in nearby countries and further afield such as in Pakistan, has shown that even dual-SIM solutions can work in certain circumstances.

As mentioned above, if countries wish to improve competition dynamics in roaming markets without relying on price regulation only, they should look at a number of issues, including some of the structural measures described. These measures should always be kept in mind when designing a wholesale and/or retail price agreement between a pair of countries, in particular regarding their cost and potential benefits.

Monitoring/enforcement

One practical issue in any roaming agreement will be the need to monitor compliance and the effectiveness of the roaming measures. Clear pricing at wholesale and as appropriate at retail level and the associated transparency measures can lower the cost of monitoring since breaches are likely to be reported by end-users.

Monitoring of measures and ensuring enforcement will entail several steps including adequate notification of the measures to consumers, as well as the implementation of any technical, commercial or charge control solutions.

In Europe, BEREC has a mandate to collect data and monitor compliance with the measures proposed. European Union legislation allows regulators to gather information concerning prices and costs generally but specific provisions are provided for in the regulation itself.

Any regulatory approach should be simple to implement and monitor in order to minimise the administrative burden both for the operators which are affected by its requirements and for the national regulatory authorities charged with its supervision and enforcement. It also needs to be transparent and immediately understandable to all mobile customers. Furthermore it should provide certainty and predictability to operators providing wholesale and retail roaming services.

A regular review of the impact of the measures in the European Union is provided for in the roaming regulation to ensure the objectives are being achieved and in order to anticipate further changes.

Similarly the Roaming Committee within AREGNET/GCC was empowered to act as a co-ordinating body to assure implementation of the roaming provisions. However, as in Europe, any specific implementation issues were left to individual regulators and conditions of signatories was that they either had, or would acquire, all necessary authorities to ensure effective implementation and compliance.

In conclusion, IMR agreements need to have adequate compliance and enforcement procedures that make sure that the agreed commitments are monitored and reviewed. It is also necessary that there is a mechanism for members to withdraw from the agreement if they wish to do so. Moreover, since roaming agreements are likely to start between two countries only, but have the potential to expand to a third country that may wish to join a given agreement, it is highly recommendable that there is a clearly established policy for new members to adhere.

ANNEX

**ROAMING RATES OFFERED BY CHINESE OPERATORS -China Mobile (CM) roamers and foreign roamers (FR) in China,
prices in USD**

	CM Roamer makes local call	FR makes local call in China	CM roamer makes call home	FR makes call home from China	CM roamer makes call to 3rd country	FR makes call to 3rd country from China	CM users send s SMS home	FR sends SMS home from China	CM user send SMS to 3rd country	FR sends SMS to 3rd country
Vodafone AU	0.16	1.45	0.47	2.40	0.47	2.86	0.06	0.735	0.20	0.735
Telstra AU	0.47	1.22	1.27	4.38	1.27	3.89	0.20	0.74	0.35	0.74
Optus AU	0.47	2.06	1.27	6.47	1.27	6.47	0.20	0.54	0.35	0.54
Rogers CA	0.63	3.00	1.27	3.00	1.27	3.00	0.16	0.75	0.30	0.75
Orange FR	0.11	3.79	0.32	3.79	0.32	1.83	0.06	0.37	0.20	0.37
NTT JP	0.32	0.93	0.79	2.16	0.79	3.27	0.14	1.23	0.28	1.23
KT KR	0.09	0.59	0.16	1.97	0.63	1.97	0.03	0.09	0.17	
KPN NL	0.47	2.60	1.11	2.60	1.11	2.16	0.20	0.98	0.35	0.98
Singtel (SG)	0.09	1.36	0.16	3.844	0.63	5.084	0.03	0.744	0.17	0.744
T-Mobile UK	0.11	2.415	0.32	2.415	0.32	2.415	0.06	0.644	0.20	0.805
T-Mobile USA	0.09	3.59	0.16	3.59	0.63	3.59	0.03	0.5	0.17	0.5
AT&T US World	0.47	1.99	0.79	1.99	0.79	1.99	0.08	0.5	0.22	0.5
AT&T US		2.29		2.29		2.29		0.5		0.5

Source: OECD

Chine Mobile roaming rates (USD)

Tariff	Country/operator	Local call	Receive call	Make call	3rd country	SMS	SMS 3 rd country	
0.99 District	United States (T-Mobile), Korea	0.09	0.16	0.16	0.63	0.03	0.17	
	Singtel (Singapore)	0.09	0.16	0.16	0.63	0.03	0.17	
	M1 Limited Singapore), StarHub Ltd (Singapore)	0.16	0.16	0.63	0.63	0.16	0.30	
1.99 District	France, Orange, SFR (France), T-Mobile, Orange, Vodafone (United Kingdom)	0.11	0.32	0.32	0.32	0.06	0.20	
	Denmark, TDC MOBILE	0.11	0.32	0.47	0.47	0.06	0.20	
	Vodafone, Omnitel, Telecom Italia (Italy), Vodafone, Orange, (Spain), Vodafone Albania	0.11	0.32	0.47	0.47	0.06	0.20	
	Germany, Vodafone, DT	0.16	0.32	0.32	0.32	0.06	0.20	
	Vodafone Egypt, Israel (partner)	0.16	0.32	0.32	0.63	0.06	0.20	
	Vodafone Australia	0.16	0.32	0.47	0.47	0.06	0.20	
	T-Mobile Czech Republic, Vodafone CZ, Vodafone Turkey	0.32	0.32	0.47	0.47	0.11	0.24	
	O2 UK	0.32	0.32	0.63	0.63	0.06	0.20	
	Japan	0.32	0.32	0.79	0.79	0.14	0.28	
	Thailand, Lithuania Omnitel, French Guyana	0.32	0.32	1.11	1.11	0.16	0.30	
	2.99 District	New Zealand, Malaysia (Maxis), Netherlands (Vodafone, T-Mobile), Brazil (TIM), Greece (Vodafone, Cosmote)	0.16	0.47	0.47	0.63	0.06	0.20
		United States (ATT, Sprint, Cingular), Sweden, Norway, Denmark (Telenor, Telia Mobile)	0.47	0.47	0.79	0.79	0.08	0.22
		South Africa, Spain (Movistar)	0.47	0.47	0.63	0.63	0.20	0.35
Switzerland, Greece (Wind), Belgium (Wind) Portugal, Ireland, Poland, Italy, Germany (E-Plus, O2), Turkey (Turkcell)		0.47	0.47	0.95	0.95	0/20	0.35	
Netherlands (Telfort, KPN), France (Bouygues Telecom)		0.47	0.47	1.11	1.11	0.20	0.35	
Malaysia (Celcom, DiGi), Australia (Optus, Telstra)		0.47	0.47	1.27	1.27	0.20	0.35	
Gibraltar, Estonia (EMT, Tele2), Panama (Digicel), Botswana (Orange)		0.47	0.47	1.74	1.74	0.32	0.46	
Albania (AMC), Tajikistan (Tcell, Tacom), Channel Islands, Algeria (Orascom), Equatorial Guinea)		0.47	0.47	3.33	3.33	0.32	0.46	
International Zone (IZ) 1		Bahrain, Tunisia, Tajikistan (Babilon)	0.32	0.95	1.27	1.27	0.32	0.46
		IZ 2	Vietnam, Bangladesh, Iran, Crete, Ghana, Nigeria, Sierra Leone, Mozambique, Guam, Saipan, Tinian, Guyana (Digicel)	0.63	0.95	1.42	1.42	0.32
	IZ 3		Laos, Oman, Yemen, Cambodia, Maldives, Pakistan, the HCIA Svalvard Islands,	0.54	0.54	1.42	2.06	0.22

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Tariff	Country/operator	Local call	Receive call	Make call	3rd country	SMS	SMS 3 rd country
	Lofoten Islands, Ziao Lun Islands, Malta, Uruguay, Fini, the Virgin Islands, Puerto Rico, the Grenadines, Hawaii, Egypt (Etisalat, Mobinil), Burundi, Central African Republic						
IZ 4	Austria, Nepal, Saudi Arabia, UAE, Jordan, Lebanon, Finland, Slovakia, Romania, Luxembourg, Isle of Arran (Aland), Sudan, Uganda, Rwanda, Iraq, Niger, East Timor, Swaziland, Madagascar, Telma (executive network)	0.79	0.95	1.90	1.90	0.32	0.46
IZ 5	Hungary, Afghanistan, Syria, Qatar, Balearic and Canary islands (Spain), Shetland and Orkney islands, Andorra, Bulgaria, Malawi, Seychelles, Bolivia, Colombia, Paraguay, Jamaica, Saint Kitts and Nevis, Barbados, Bermuda	0.79	0.95	2.06	2.06	0.32	0.46
	Kuwait, Liechtenstein, Azores and Madeira (Portugal), Hong Kong China, FYROM, Latvia, Croatia, Iceland, Moldova, Faroe islands, the Vatican, Sicily and Sardinia (Italy), Jersey, Suriname, Brazil (Claro, Vivo, Oi), Chile, Namibia, Togo, Guatemala, Craig Glaser, Honduras, Ivory Coast	0.79	0.95	2.06	2.06	0.32	0.46
IZ 7	India, the Democratic Republic of Congo, Gambia, Congo, Venezuela, Tahiti, Mexico, Stewart Island, Aruba, Costa Rica, Libya	0.79	0.95	2.53	2.53	0.32	0.46
IZ 8	Philippines, Israel (Cellcom), Brunei, Argentina, Peru, Morocco, the Dominican Republic, Ethiopia, Northern Ireland, Papua New Guinea, Belarus, Turkey (AVEA), Azerbaijan, Gabon, Estonia (Elisa), Algeria (Wataniya Telecom)	0.79	0.95	2.69	2.69	0.32	0.46
IZ 9	Kyrgyzstan, Indonesia, Ukraine, Slovenia, Ecuador, Mali, Belize, Cuba, Guadeloupe, Martinique, Zambia, Palau Island, Angola, Ivory Coast (MTN), Armenia (Armentel), Lithuania (Bite Lietuva, Tele2), Guyana (GTT), Sri Lanka (Dialog Telecom)	0.79	0.95	3.33	3.33	0.32	0.46
IZ 10	Russia, Kenya, Cameroon, Czech Republic (O2), Panama (CWP)	0.95	0.95	4.12	4.12	0.32	0.46
IZ 11	Turkmenistan, Montenegro, Zimbabwe, Cape Verde, Chad	0.79	0.95	6.34	6.34	0.32	0.44
IZ 12	Uzbekistan, Serbia, Bahamas, Benin	0.79	0.95	5.39	5.39	0.32	0.46
IZ 13	Kazakhstan (Kcell)	0.79	0.95	2.53	2.53	0.16	0.30
IZ 14	Nicaragua, Botswana (Mascom)	0.79	0.95	3.33	3.33	0.16	0.30
IZ 15	Canada (Rogers, communication partners, Telus)	0.63	0.95	1.27	1.27	0.16	0.30
IZ 16	Bosnia and Herzegovina, El Salvador, Burkina Faso, Reunion, Armenia (K Telecom), Madagascar (Zain, Orange)	0.63	0.63	3.33	3.33	0.32	0.46
IZ 17	Sri Lanka (Mobitel), Mongolia	1.27	0.65	3.64	3.64	0.32	0.46

Source: China Mobile

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ENDNOTES

1

<http://acts.oecd.org/Instruments/ShowInstrumentView.aspx?InstrumentID=271&InstrumentPID=276&Language=en&Book=False>.

2

For example: “StarHub chief executive Neil Montefiore slammed the high cost of mobile data rates and called for a reduction. The CEO said that four out of five StarHub mobile users currently disable data when overseas, due to the exorbitant charges, and bemoaned the fact that too many operators refuse to cut their rates as they make so much money from international data roaming. Montefiore says that the situation needs to change and that the mobile industry needs to see the wider opportunity presented here.” www.telegeography.com/products/commsupdate/articles/2012/03/08/starhub-inks-improved-roaming-deal-with-vodafone/.

3

“Based on insights from the millions of daily transactions it processes, as well as third-party data from Informa Telecoms & Media, Syniverse has calculated there is a monthly average of approximately 75 million unique outbound international roamers. The company has found that more than 50% of those roamers do not use voice services and up to 70% do not use data services. Those figures combined represent a total lost revenue opportunity of more than USD1.2bn.” http://www.vanillaplus.com/news/silent_roamers_result_in_1_2bn_of_lost_revenue_says_syniverse

4

See the Commission’s Impact assessment here:

http://ec.europa.eu/information_society/activities/roaming/docs/impac_ass_11.pdf.

5

http://erg.eu.int/doc/berec/bor_10_58.pdf

6

Again a number of authors propose such a mechanism, Bühler (2009) and Shortall (2010).

7

See FCC, Eleventh Annual Report to Congress on the State of Competition in the Commercial Mobile Radio Services (CMRS), Industry REPORT (FCC 06-142). Available from: http://wireless.fcc.gov/index.htm?job=cmrs_reports

8

See for example OECD (2011), “International Mobile Data Roaming”, OECD Digital Economy Papers, No. 180, OECD Publishing. <http://dx.doi.org/10.1787/5kg9zb67l6r3-en> and also OECD: International Mobile Roaming Charging in the OECD Area 2009.

9

If an operator in country A wishes to offer its customers the ability to roam in country B, it purchases a wholesale service from an operator based in country B, but sells it as a retail service in country A. It is for this reason that regulators are not in a position to tackle roaming at a national level except to address certain transparency issues.

10

Directive 2002/19/EC on access to, and interconnection of, electronic communications networks and associated facilities [2002] OJ L 108/7 (Access Directive); Directive 2002/20/EC on the authorisation of electronic communications networks and services [2002] OJ L 108/21 (Authorisation Directive); Directive 2002/21/EC on a common regulatory framework for electronic communications networks and services [2002] OJ L 108/33 (Framework Directive); Directive 2002/22/EC on universal service and users’ rights relating to electronic communications networks and services [2002] OJ L 108/51 (“Universal Service Directive”); Decision No.676/2002/EC of 7 March 2002 on a regulatory framework for radio spectrum policy in the European Community (“Spectrum Decision”).

11 OJ L 114, 8.05.2003, p. 45.

12 http://erg.eu.int/doc/whatsnew/reg_intens_wrk_intl_roaming_mtg.pdf

13 OJ L 344, 28.12.2007, p. 65.

14 For a thorough description of the Roaming Regulations see Sutherland, Ewan, 2009 The European Union Roaming Regulations <http://ssrn.com/abstract=1574981>

15 See for example http://erg.eu.int/doc/2012/bor12-14_int_roaming.pdf

16 Though not formally adopted by the legislature the unofficial final form is available here: http://ec.europa.eu/information_society/activities/roaming/docs/roaming_recast11.pdf

17 www.computerworlduk.com/news/mobile-wireless/3339022/mobile-network-3-calls-on-government-to-lower-europe-data-roaming-charges/.

18 Commission Implementing Regulation (EU) No 1203/2012 of 14 December 2012 on the separate sale of regulated retail roaming services within the Union, Official Journal of the European Union, 15 December 2012. <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2012:347:0001:0007:EN:PDF>

19 www.wto.org/english/tratop_e/serv_e/sym_march12_e/presentation_%20maitha_jaffar.pdf.

20 <http://www.tra.org.bh/en/pdf/Roaming-MOU-Final.pdf> **Error! Hyperlink reference not valid.**

21 International mobile roaming: competition, economics and regulation by Ewan Sutherland available here: www.wto.org/english/tratop_e/serv_e/sym_march12_e/doc_other_docs_a.pdf.

22 For example, in Oman a transparency obligation was imposed in 2007, where operators were obliged to inform consumers of the roaming charge as soon as they land on a visited network.

23 The members of GCC are Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates.

24 http://www.wto.org/english/tratop_e/serv_e/sym_march12_e/presentation_%20maitha_jaffar.pdf

25 A figure of 30%, above IOTs, has sometimes been used historically by operators, such as Telstra in Australia, to set retail prices.

26 http://minsvyaz.ru/ru/news/index.php?id_4=42921

27 www.ida.gov.sg/doc/News%20and%20Events/News_and_Events_Level2/20110314122636/AnnexA.pdf.

28 See Borthwick, R. (Axiata), “Bilateral mobile roaming price control in ASEAN: the Singapore-Malaysia case”.

29 www.crasa.org/index.php.

30 www.anatel.gov.br/Portal/exibirPortalInternet.do.

31 See for instance <http://apps.three.ie/apps/roaming/pages/display/three-like-home>.

32 “Mobile Roaming -Chinese Experience” Xiongshan Cai Ministry of Industry and Information Technology , PRC, 22 March 2012. □ www.wto.org/english/tratop_e/serv_e/sym_march12_e/presentation_mr_cai.pdf.

33 <http://consumerist.com/2011/10/t-mobile-customer-runs-up-201000-phone-bill.html>

34 It may be that they consider that they do face a constraint, that is they may still set retail prices on the basis
of the headline wholesale price which acts so as to set a price floor. This was described in some detail by
Tirole, Rey and others in various papers on M2M interconnection regimes.

35 BoR (10) 58 International Mobile Roaming Regulation BEREC Report.

36 Average Revenue Per User – a key industry metric.

37 http://erg.eu.int/doc/2012/bor12-14_int_roaming.pdf

38 Note that the blended inbound and outbound roaming rate is closer to 20% while this rate is due to rise
considerably under the roaming III proposals.

40 Article 19.

41 It might be that redundancy or coverage requirements may result in multiple partners.

42 John Biggs, “New Case Device Adds Dual SIMs To iPhone 4”, 8 November 2011,
<http://techcrunch.com/2011/11/08/new-case-device-adds-dual-sims-to-iphone-4/>

43 <http://europa.eu/rapid/pressReleasesAction.do?reference=MEMO/12/227>

44 http://erg.eu.int/doc/berec/bor_11_46.pdf.