Final Report:

International Mobile Roaming (IMR) across the Gulf Corporation Council (GCC) Region

Issuing Party: **Gulf Corporation Council (GCC) Roaming Working Group**

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Purpose: To inform stakeholders of the GCC Roaming Working Group's conclusions in regard to setting of fair, reasonable and non-discriminatory prices and conditions for the exchange of traffic related to International Mobile Roaming (IMR) between GCC member states.

Executive Summary

International Mobile Roaming (IMR) has been a topic of intense discussion and concern for many years now, not only within the GCC region, but also globally. It is widely acknowledged that, in the absence of intervention by governments or regulators, the prices that consumers pay for IMR services tend to be high in relation both to comparable domestic prices and to the real underlying cost of providing these services. These inflated prices are understood to represent a burden on societal welfare, and can also result in individuals being subject to the risk of unexpectedly high bills ("bill shock"), and needing to have multiple *Subscriber Identification Modules (SIMs)* and thus multiple mobile numbers across the different countries that they frequently visit.

In response to these concerns, the GCC Ministerial Committee studied, consulted on, and implemented a roaming Regulation in 2010. The Regulation took full effect as of 1 February 2012. A price cap was introduced at the retail and wholesale level on calls made within the visited country (local calls), and on calls made to other GCC member states (international calls), including the home country.

The GCC ministers have called for an assessment of the effectiveness of the existing Regulation, and a review of all other IMR services (including data, voice calls received, SMS, MMS, and video calls) in order to determine whether further regulation is needed. This report is the response of the GCC *Roaming Working Group (RWG)* to that request.

International Mobile Roaming poses difficult challenges

International Mobile Roaming cannot be addressed by any single country. There are inevitably wholesale payments from the network in the home country to that in the visited country, neither of which is motivated to lower the charges for the other (unless perhaps in the case where they belong to the same corporate group). These challenges can, however, be collectively addressed by groups of countries that are willing and able to tackle them collectively.

Highly motivated business travellers and tourists have always had ways to get around the high price of IMR; however, none of these has provided a complete and convenient replacement or substitute for IMR services. In economic terms, these work-arounds constitute imperfect substitutes for IMR services. Indeed, if roaming were not perceived as being high priced, it is likely that few of these alternatives would see much use.

The most obvious is so-called "plastic roaming", where a user with an unlocked handset purchases a subscription (and a SIM card) for a country to which he or she frequently travels. Although the roamer will no longer be contactable on his or her home telephone number, this can work reasonably well if there are only one or two countries to which the roaming individual travels regularly. It is less useful if the roamer visits multiple countries briefly and unpredictably, since the roamer has to choose a network operator in each visited country (implying search costs), and has to obtain or maintain services in each country.

The use of Wi-Fi Internet access in (for instance) the roamer's hotel (together with the use of Over-the-Top services such as Skype, WhatsApp and Viber) provides another important means of avoiding high IMR charges. Wi-Fi is increasingly widely available in the GCC, and can sometimes work well, but again it has its limitations. First, one is limited to fixed locations where Wi-Fi access is available; thus, the service is not truly mobile. Second, Wi-Fi access may not satisfy needs for voice services, particularly when one considers that the use of Voice over Internet Protocol (VoIP) services is restricted or blocked in a number of GCC member states.

Effects of the current regulation to date

Compliance with the Regulation appears to have been good once it was fully implemented. The Regulation has proven to be effective in reducing the level of retail and wholesale prices for calls placed while roaming.

The volume of minutes for voice calls originated in total has increased slightly (some 11%) since the Regulation came into force, probably largely in response to lower prices. Meanwhile, the volume of mobile roaming data is increasing rapidly.

Prices for other IMR services continue to be high. This is especially worrisome in the case of data roaming, which can be viewed as the most important IMR service going forward.

The price reductions already achieved have benefitted consumers, as well as the GCC economy at large. The RWG estimates that the existing Regulation resulted during 2012 in a transfer of welfare from network operators to consumers of some 79.5 million USD, and a reduction in deadweight loss (caused by calls that would have been made, but were not due to high prices) of 4.3 million USD. These numbers are significant, but they are not dramatic. Looking forward, much greater benefits could be expected if roaming data were to be subjected to price controls, as we explain later in this Executive Summary.

Rationale for further action

There are two interrelated rationales that suggest the need for a policy intervention at the GCC level. Both concerns are, at their core, economic concerns, but they manifest differently.

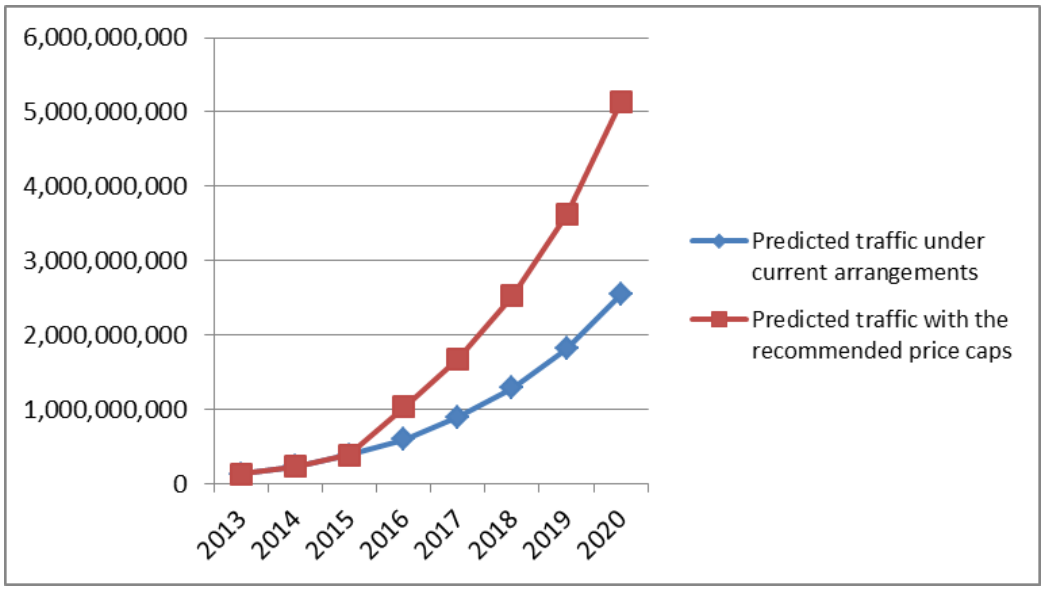
- The first has to do with the integration and the social cohesion of the GCC as whole. This is fundamentally a politically driven issue, and not solely an economic matter. This rationale is grounded in the GCC Charter and in the Economic Agreement of 2001, where scale economies and a stronger bargaining position in any international negotiations are clear objectives.
- The second is based on the recognition that consumers and business travellers use their mobile devices differently (and less) when roaming than they do for purely domestic purposes. The usage that is sacrificed represents a direct economic loss for the region (a *deadweight loss*), and likely has negative spill-over effects into the broader regional economy. This is primarily a matter of industrial and regulatory policy.

It is reasonably clear that individual national regulatory authorities acting independently of one another have only limited ability to address IMR issues in the GCC region. The retail price charged in one member state for IMR services depends crucially on wholesale charges in the other GCC member states. If action is to be taken, coordinated action at GCC level is called for.

The argument for action at this particular time is largely driven by the rapid growth in the GCC of mobile data traffic. If prices remain at current levels, use of mobile data services while roaming will be depressed, and regional efficiency will be lost; conversely, prudent regulation at this time can help the GCC region to achieve its full potential as regards the use of mobile data services.

The RWG's recommended approach represents a very large cut to mobile roaming data prices. The expected increase in traffic volume as a result (under the most likely assumptions) is dramatic. This increased usage can be expected to generate direct economic benefits. In addition, it can be expected to generate "spill over" effects into business in the region, and to contribute to enhanced economic and social cohesion.

Expected growth in the annual use of roaming data services due to the use of the RWG's recommended approach (MB)



Recommended policy measures

The RWG recommends to the Ministers a range of wholesale and retail price controls on IMR services, together with supporting measures, in order to promote the interests of the GCC, its businesses, and its citizens and residents.

The RWG is of the view that both wholesale and retail price controls should be imposed on IMR calls made, calls received, SMS sent, and data sent or received when roaming within the GCC. Controls for calls made and SMS sent apply only where the destination of the call or SMS is also within the GCC.

Subject to the price controls, MNOs should have as much retail pricing flexibility as possible; however, they should not be permitted to offer commercial roaming packages where, under reasonable assumptions as to the unit price to impute to the roaming service, the package would generate a higher price than the regulated rate even if all roaming minutes, SMS, and data MB in the bundle were fully utilised. National authorities may require MNOs to notify them in advance of proposed commercial roaming packages in order to ensure that these conditions are met.

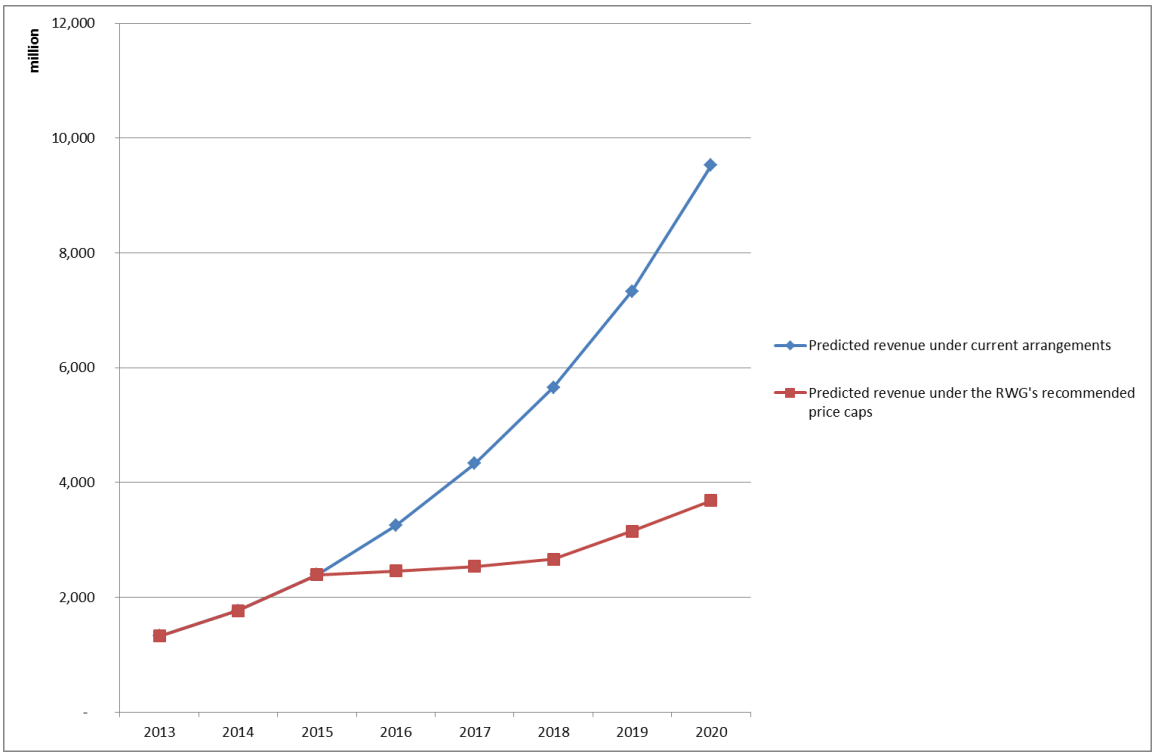
The RWG recommends implementation of IMR price controls for voice calls made, voice calls received, and SMS in three steps in 2016, 2017 and 2018; for data, however, the RWG recommends five steps in 2016, 2017, 2018, 2019, and 2020 (see the tables at the end of this Executive Summary). In each case, wholesale controls would come into effect on 1 January, while the corresponding retail controls would come into effect on the following 1 April.

Any measures taken should consider both consumer welfare and MNO welfare, since both contribute to societal welfare. In this regard it is important to avoid abrupt "shocks" and needless disruption to MNO revenues and profits.

No one can predict the future with perfect confidence; however, the RWG has sought to use the level and glide path of regulated roaming data prices as a "control knob" to enable a smooth, gradual transition, with as little disruption as possible to the MNOs. Through the careful tailoring of these control knobs, it is possible (under the evolution of consumer and business demand for roaming data services that the RWG considers to be most likely) to ensure that MNO IMR

revenues remain in excess of 2015 levels. The expected growth of mobile data services in general is the economic "engine" that makes this possible.

Expected evolution of total GCC MNO revenues if no action is taken versus under the RWG's recommended price caps (millions of USD)



The specific IMR price caps are intended to be as low as feasible while still reflecting true costs, and allowing an appropriate overall return on MNO investments, *even in those GCC member states where costs are highest*. They are also consistent across the GCC member states, with the sole exception of the regulated price of calls received by Kuwaiti roamers. The proposed levels of wholesale and retail caps for each IMR service appear in the tables at the end of this section.

SMS received while roaming are not discussed here because they are not charged for today. The RWG expects (and insists) that this should continue to be the case going forward.

The RWG is not recommending specific measures at this time to mitigate alleged asymmetric bargaining power among MNOs.

In order to ensure that future policy is well informed, the RWG proposes to initiate a semi-annual comprehensive collection of quarterly data associated with the provision of IMR services on the part of GCC MNOs. The proposed methodology and questionnaire are inspired by models employed by national regulatory authorities in Europe (BEREC).

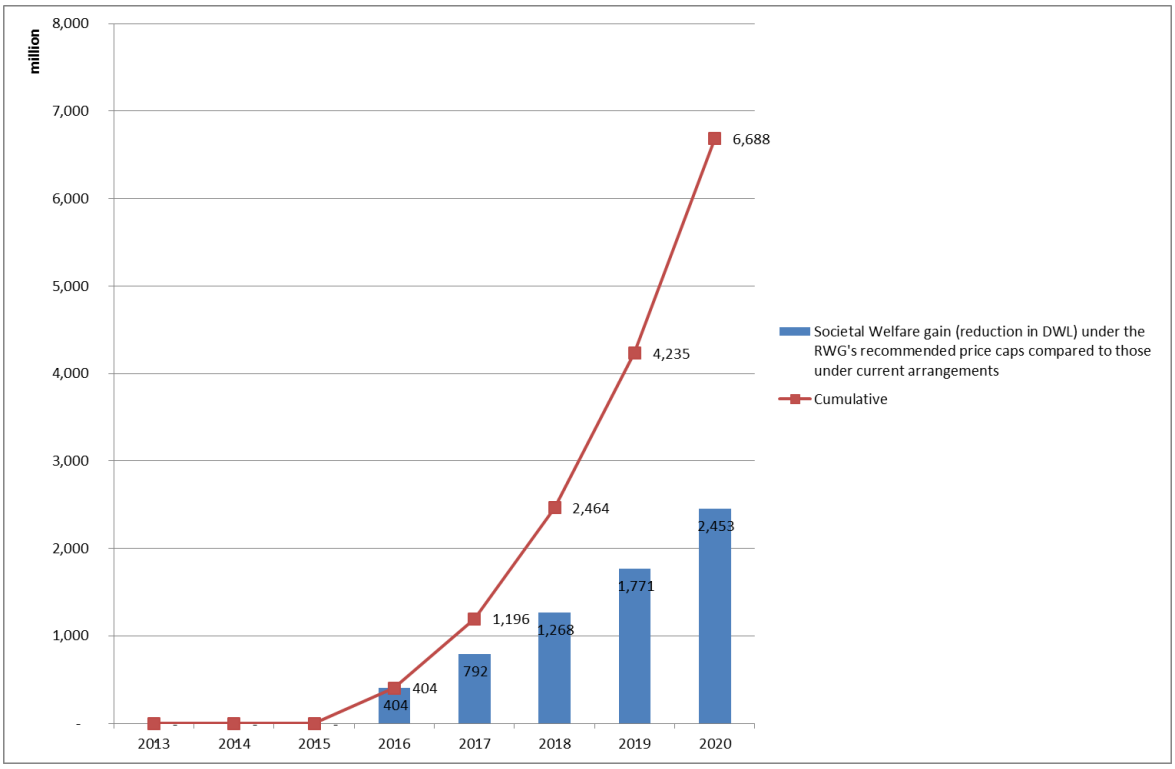
The RWG recognises the efforts already undertaken by a number of GCC MNOs to reduce the risk of bill shock, but is of the view that many GCC MNOs need to do more. The RWG expects MNOs that have not already done so to implement bill shock measures providing for thresholds in terms of charges incurred for IMR voice, SMS, and data within one year of the publication of the new Regulation, and notification of users as thresholds are approached or exceeded (similar to the arrangements already implemented in Oman). The RWG expects all operators to implement some sort of threshold system. The RWG will at that stage assess whether any obligatory system should be imposed.

By 31 December 2018, the RWG will decide whether reasonable grounds exist to commence a further review of the roaming Regulation. In the interim, the RWG will monitor data collected from operators.

Expected effects

Under the RWG's recommended approach, the price caps begin to drive increased usage of services, especially data roaming services (as explained earlier), starting in 2016. This increases societal welfare by reducing deadweight loss. These effects are substantial.

Predicted direct gain in societal welfare (reduction in deadweight loss) under the the RWG's recommended approach compared to a "business as usual" approach (millions of USD)



Recommended price caps for calls made while roaming (USD per minute)

Within the Visited Country							
	Today	As of 1 January 2016	As of 1 April 2016	As of 1 January 2017	As of 1 April 2017	As of 1 January 2018	As of 1 April 2018
Wholesale cap	$ 0.21	$ 0.19		$ 0.18		$ 0.17	
Retail cap	$ 0.28		$ 0.26		$ 0.25		$ 0.24
Retail/wholesale mark-up	33%		37%		39%		41%
To other GCC Member States							
	Today	As of 1 January 2016	As of 1 April 2016	As of 1 January 2017	As of 1 April 2017	As of 1 January 2018	As of 1 April 2018
Wholesale cap	$ 0.50	$ 0.47		$ 0.45		$ 0.43	
Retail cap	$ 0.66		$ 0.64		$ 0.62		$ 0.60
Retail/wholesale mark-up	32%		36%		38%		40%

Recommended price caps for calls received while roaming (per minute)

Calls received	**As of 1 April 2016**	**As of 1 April 2017**	**As of 1 April 2018**
Retail cap (other than Kuwait)	$ 0.35	$ 0.28	$ 0.22
Retail cap (Kuwait)	$ 0.66	$ 0.60	$ 0.55
Markup versus cost (other than Kuwait)	147%	97%	55%
Markup versus cost (Kuwait)	67%	52%	39%

Recommended price caps for each SMS made while roaming

SMS	**As of 1 January 2016**	**As of 1 April 2016**	**As of 1 January 2017**	**As of 1 April 2017**	**As of 1 January 2018**	**As of 1 April 2018**
Wholesale cap	$ 0.04		$ 0.04		$ 0.04	
Retail cap		$ 0.08		$ 0.07		$ 0.06
Retail/wholesale mark-up		100%		75%		50%

Recommended price caps for roaming data (per Megabyte).

	As of 1 January 2016	**As of 1 April 2016**	**As of 1 January 2017**	**As of 1 April 2017**	**As of 1 January 2018**	**As of 1 April 2018**	**As of 1 January 2019**	**As of 1 April 2019**	**As of 1 January 2020**	**As of 1 April 2020**
Wholesale cap	$ 0.80		$ 0.50		$ 0.35		$ 0.30		$ 0.25	
Retail cap		$ 1.30		$ 0.85		$ 0.60		$ 0.50		$ 0.42
Retail/wholesale mark-up		63%		70%		71%		67%		68%

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1 Introduction

1. It is widely recognised that, in the absence of regulation, the price of IMR tends to be greatly in excess of the actual underlying costs of supplying such services. These inflated prices are understood to represent a burden on societal welfare, and also results in individuals having multiple SIM (Subscriber Identification Module) numbers across the different countries they frequently visit. The basis for this concern and the rationale for action by the GCC is discussed in Section 6.
2. Based on the survey and analysis that the RWG conducted, the volume of IMR traffic and revenues are substantial, and the prices of most IMR services appear to bear little relation to true underlying cost. Unit prices for data roaming are a matter of particular concern.

Table 1 - Key characteristics of IMR in the GCC region (2012, in USD)

Service	Unit	Volume	Revenue[1]	Unit Price
Calls Made	Minutes	207 million	197 million	0.70[2]
Calls Received	Minutes	184 million	108 million	0.59
SMS Made	SMS	72 million	34 million	0.47
Data	MB	69 million	421 million	6.11

3. In response to these concerns, the GCC Ministerial Committee studied, consulted and implemented a roaming Regulation in 2010. The Regulation took full effect as of 1 February 2012.[3] A price cap was introduced at the retail and wholesale level on calls made within the visited country (*local calls*), and on calls made to other GCC member states (*international calls*) including the home country.
4. The GCC ministers have called for a review of all other IMR services (including data, SMS, MMS and video calls) in order to determine whether further regulation is needed. Based on this mandate, the RWG started a public consultation with stakeholders.
5. The GCC RWG appointed WIK-Consult GmbH by means of a competitive procurement process to conduct a supporting study, including the collection of relevant data, and to serve as advisers to the RWG on the matter.
6. With the help of the consultant, the RWG issued a questionnaire to all MNOs in the GCC member states in order to determine whether further regulation is needed. All GCC region MNOs eventually responded.
7. Based on the responses to the questionnaire, together with the consultant's analysis, it appears that:
    - Compliance with the Regulation appears to have been good once it was fully implemented (see Section 4).

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1 Total revenues reflect estimates for missing data, as not all operators could provide revenue information for all roaming services.

2 The total volume and total revenue for Calls Made are for all IMR calls, while the estimate of unit price is only for outgoing voice to GCC member states other than the visited country, and is based only on network operators that implemented on time. It is not developed on the same basis as the estimates of total revenues and total minutes.

3 Most mobile operators implemented the regulation on time, and all by September 2012.

- The Regulation has proven to be effective in reducing the level of retail and wholesale prices for calls placed while roaming (see Sections 4 and 8.2).
- These price reductions benefit consumers, as well as the GCC economy at large (see Section 8.4).
- The volume of minutes for voice calls originated in total has increased slightly since the Regulation came into force (see Section 4.4.1), probably in response to lower prices.
- Meanwhile, the volume of mobile roaming data is increasing rapidly (see Section 4.4.1).

8. The RWG then published a Consultation Document concerning International Mobile Roaming (IMR) across the Gulf Cooperation Council (GCC) Region on 4 September 2014. Stakeholders were asked to submit their comments not later than 6 November 2014 (subsequently extended to 5 December 2014).

9. Seventeen stakeholders, including thirteen of the fifteen MNOs in the GCC region, availed themselves of the opportunity to provide their opinions on IMR across the GCC region.

10. Many of the responses were confidential. They are summarized, without attribution to the stakeholders that made them, in Chapter 6 of this document.

11. This document discusses: (1) how IMR operates in the GCC region; (2) an assessment of the data gathered from MNOs in the region; (3) the costs and cost drivers of IMR in the GCC region; (4) an assessment of the effectiveness of the current Regulation; (5) a review of stakeholder responses to the public consultation; (6) the rationale for action at GCC level, and (7) the recommended measures to be taken in terms of retail and wholesale roaming price control in the GCC region, together with complementary measures.

2 Background on International Mobile Roaming across the GCC

12. Many governments have been concerned over IMR prices that appear to be unjustifiably high. In the Arab world, international mobile roaming first surfaced as a regulatory concern in 2005 at the 9th Meeting of the Council of ICT Ministers, which proposed to undertake a study into roaming charges in the Arab League countries, to limit the retail mark-up added to wholesale charges to 15%, and to introduce full consumer price transparency. In 2006, the Council of ICT Ministers agreed that Arab national regulators at national level should impose obligations on operators that included (1) a reduction of international roaming retail tariffs to a level "that is appropriate and acceptable in accordance with global norms"; (2) a lowering of *Inter-Operator Tariffs (IOTs)* in bilateral negotiations; and (3) *Short Message Service (SMS)* transparency measures.

13. In 2007, the *Arab Regulators' Network (AREGNET)* drafted a recommendation on roaming regulation; however, based on a request from mobile network operators, AREGNET ultimately decided to pursue industry self-regulation instead.[4] Commercial offers and roaming alliances were surfacing as a response to Zain's One Network expansion (in some Arab states). Further work was done throughout 2008 and 2009. The outcome of that work was a mandate to mobile network operators to send a welcome SMS informing customers of retail roaming prices. No price caps were set at that point in time.

14. On 8 June 2010, the Telecommunications Steering Committee presented a recommendation to the GCC Telecommunications Ministers Committee at their 19th meeting held in Kuwait for setting a maximum cap on wholesale and retail mobile roaming tariffs within GCC member states as recommended by the RWG and presented by the chair of the RWG. This recommendation was approved.

15. This approved Regulation was implemented and became fully effective across the GCC member states as of 1 February 2012.[5] A price cap was introduced at the retail and wholesale level on calls made within a GCC visited country (*local calls*), and on calls made to other GCC member states (*international calls*) including the home country. The GCC ministers also called for a review of all other IMR services, including data, SMS, MMS and video calls, in order to assess whether regulation is needed. The RWG started a consultation on that matter.

16. The RWG appointed WIK-Consult GmbH by means of a competitive procurement to conduct a supporting study, including the collection of relevant data, and to serve as advisers on the matter. WIK-Consult GmbH has been asked to (1) analyse (to the extent possible) the provision of roaming services in the GCC region and identify any areas where amendments to the Regulation, or public policy interventions beyond the Regulation, may be required; (2) define a set of options to address any problems identified consistent with international best practice; (3) identify the most appropriate option(s) for successful implementation; (4) assess the possibility of using a per-second charging mechanism for both retail and wholesale roaming charges for all voice calls, and (5) assess the possibility of using a unified per KB (kilobyte) or per MB (megabyte) charging mechanism for both retail and wholesale charges for all roaming data.

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4 A GSMA-led initiative.
5 Most mobile operators implemented the regulation on time, and all by September 2012.

3 How international mobile roaming works in the GCC

17. Section 3.1 explains the Roaming Working Group's understanding of how IMR functions in the GCC, using scenarios to illustrate the flows of traffic and payments. Section 3.2 presents technical aspects of IMR.

3.1 Roaming services and roaming scenarios in the GCC

18. International Mobile Roaming (IMR) in the GCC works largely in the same manner as in other parts of the world. The common suite of services is offered including voice, data, SMS and MMS roaming.

19. International mobile roaming in the GCC involves the placing or receiving of a voice call, video call, SMS, MMS, or the download and upload of data while travelling within the GCC member states or to any country outside the GCC region.[6] Parties typically involved in roaming include the home network, the visited network and/or a third network, an international transit carrier, an Internet service provider, a financial clearing house, a data clearing house, the roamer and his or her mobile station, and a second party and his or her mobile station that makes or receives the call, data, SMS to or from the roamer. Once a mobile phone is switched on when travelling abroad, the visited network checks whether the mobile phone is registered in its Home Location Register (HLR). If not found, it attempts to identify the mobile phone's home network by contacting the home network and requesting service information using the International Mobile Subscriber Identity (IMSI) number embedded on the subscriber's SIM card.[7] IMR services in the GCC are offered based on 2G and 3G networks. Roaming based on Long Term Evolution (LTE), which is sometimes referred to as a form of 4G, is beginning to be deployed in the GCC.

20. There are six main scenarios that can be identified regarding outgoing and incoming communications made or received by roamers in the GCC. These include:

- Outgoing voice and SMS:
  - **Scenario 1:** Calls and SMS made by the subscriber terminating on the visited network, the fixed network or another mobile network inside the same visited country (local calls)
  - **Scenario 2:** Calls and SMS made by the subscriber from a visited country to the subscriber's home country or another GCC member state, terminating on the home network, the fixed network or on another mobile network (international GCC calls)
  - **Scenario 3:** Calls and SMS made by the subscriber from a visited country to a third country terminating on a fixed or mobile network outside the GCC (international non-GCC calls)
- Incoming voice and SMS:
  - **Scenario 4:** Calls and SMS received by the subscriber from home / a third country while in a visited country

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6 Given the limited volumes of MMS and video calls, this Consultation Document excludes MMS and video calls from the analysis.

7 The IMSI is also contained in the subscription data in the HLR. The IMSI is used for identifying a subscriber for various processes in the GSM network, which include location update, terminating call and roaming charging.

- **Scenario 5:** Calls and SMS received by the subscriber from another subscriber of the visited country – the subscriber can be part of the visited network, the fixed network or another mobile network of the visited country

➢ Data:

- **Scenario 6:** Data downloaded or uploaded by the subscriber while roaming in the visited country.

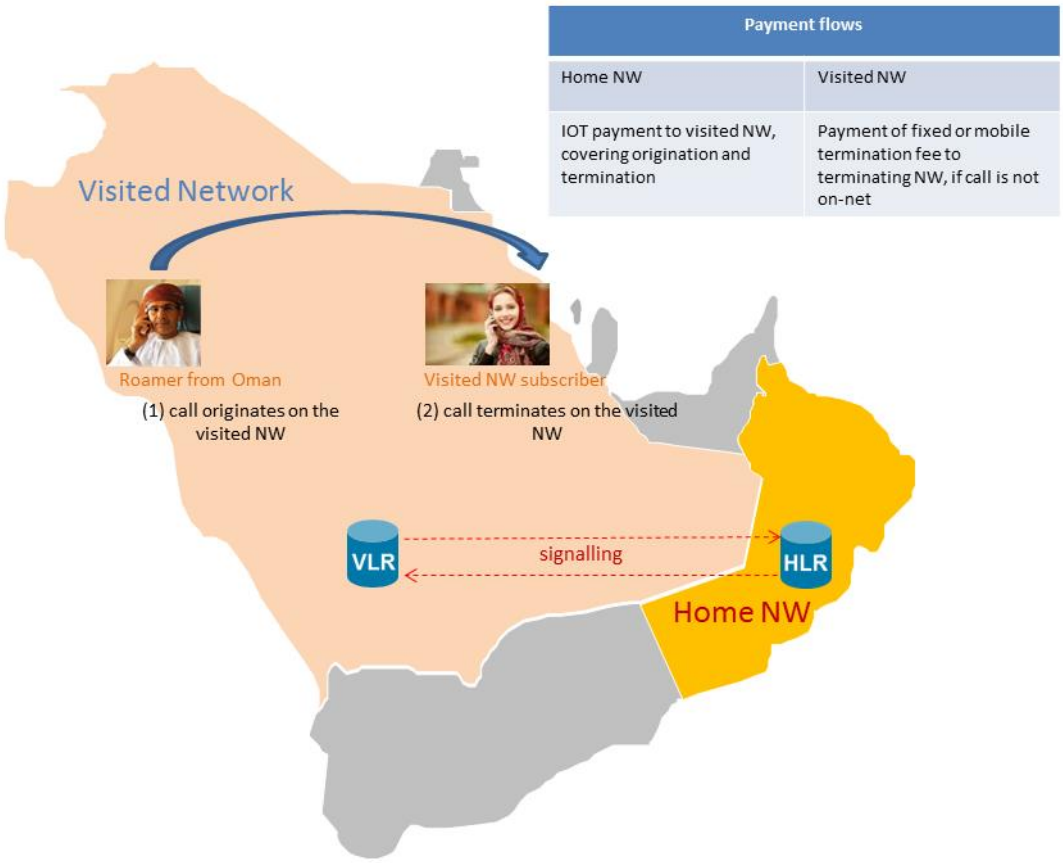
21. The generic sequential process that an international roaming activity follows often entails:
    - origination (including routing to the switch) and network access;
    - signalling and routing between the visited and home networks;
    - international transit, and
    - termination.[8]
22. Voice calls and data for Scenarios 1 through 6 have been illustrated graphically in this section.
23. For simplicity and clarity, Saudi Arabia has been used as an example of the visited country, and Oman as an example of the home country in all of the roaming scenarios included in this section. Any other GCC country could have served just as well as an example. The United Kingdom has been chosen to represent a country outside the GCC region.

Scenario 1

24. *Figure 1* illustrates Scenario 1, where an Omani mobile subscriber makes a call from his Omani mobile to a Saudi subscriber while roaming in Saudi Arabia. Note that the red arrows mean signalling activity and the blue arrows show the direction of the call flow. The call is originated on the Saudi visited network and terminates on the Saudi visited network. Given that the roamer's home network is not the destination network, it is not involved in technically placing the call, other than in relation to non-call related signalling. By contrast, outgoing SMS messages always hub through the home network, on their way from the visited network to the destination network.

8 For data and MMS roaming, there is no such thing as origination and termination; instead, data is transported across the network, and the costs that are incurred are data traffic and data network costs.

Figure 1 - Scenario 1 – Calls made inside a visited country ("Local Calls")



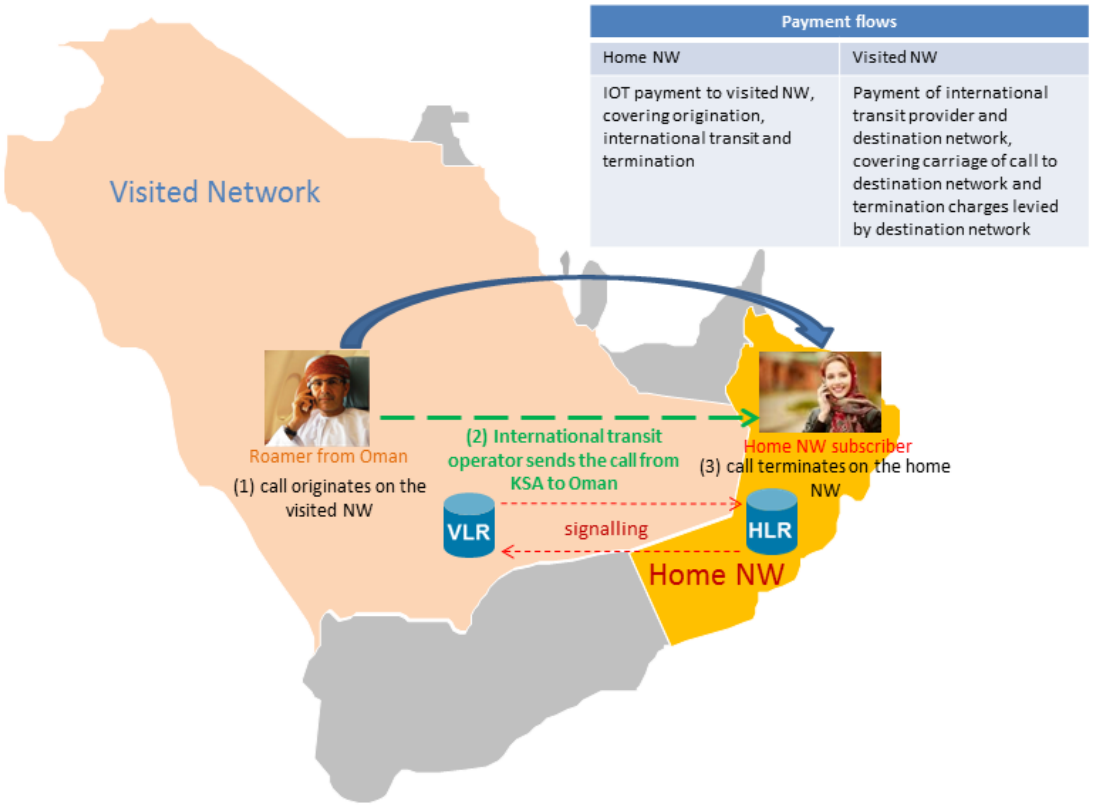
25. In regards to the charging mechanism for Scenario 1 (for both voice calls and SMS), the roamer's home network in Oman pays a wholesale Inter-Operator-Tariff (IOT)[9] to the visited network in Saudi Arabia, which covers the cost of call origination, access, and termination on the end network (no international transit charges are applicable in this call scenario). The visited network in Saudi Arabia is responsible for providing the call, and typically pays a termination fee to the fixed or mobile terminating network, unless the call is terminating on its own network (i.e. not on-net to the network which the roamer is roaming on). The Omani roamer (subscriber or end user) would pay a retail payment to his or her home network back in Oman.

Scenario 2

26. Figure 2 illustrates the most common variant of Scenario 2, where calls are made by an Omani roamer back to Oman while roaming in Saudi Arabia (the other variant involves calls to other GCC member states).

9 The wholesale IOT payment is formally defined as a tariff scheme between mobile network operators, charged by the visited network operator to the home network operator for calls, SMSs or data originated on the visited network. In this document, we use IOT as a shorthand reference for all wholesale payments, but in practice many MNOs negotiate special preferred arrangements.

Figure 2 - Scenario 2 – Calls made from a visited country to the subscriber's home country ("International GCC Call")



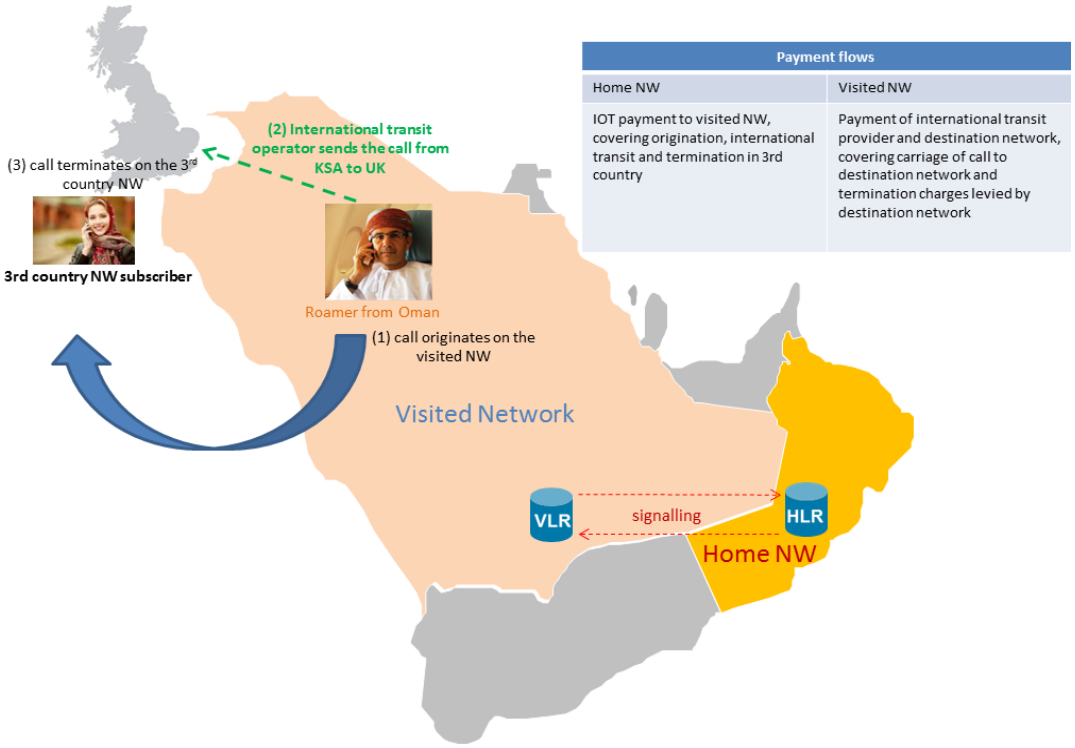
27. In Scenario 2, the call originates on the Saudi visited network, and is then routed via an international transit carrier (or via self-supplied transit) to a destination mobile network in Oman, instead of being terminated on a Saudi visited network. In the case of an SMS, the SMS will also have to hub through the home network before reaching the destination network. Note that the red arrows mean signalling activity, while the blue arrows show the direction of the call flow. The green arrow signifies the international transit portion of the call flow. Depending on the recipient's network and location, the call is terminated on one of the Omani mobile networks or on the Omani fixed network.

28. As regards the charging mechanism for Scenario 2 (for both voice calls and SMS), the roamer's home network in Oman makes an IOT payment to the visited network in Saudi Arabia, which covers call origination and access, the arranging for and payment of international transit and termination on the end network (in this case either the home network, one of the other Omani mobile networks or the fixed network). If the end-network is the home network, the home network self-supplies termination). The visited network in Saudi Arabia is responsible for providing the call, and pays a transit fee to the transit operator and a termination fee to the fixed or mobile terminating network in Oman. Some visited network operators also make a bundled payment of transit and termination to the transit operator, who then passes on the termination fee to the terminating network, thereby creating a cascading billing structure. The Omani roamer makes a retail payment to his or her home network in Oman.

Scenario 3

29. Figure 3 illustrates Scenario 3, where calls are made by an Omani roamer to neither a local number nor a country within the GCC member states while roaming in Saudi Arabia (International calls outside the region).

Figure 3 - Scenario 3 – Calls made from a visited country to a third country ("International Calls")



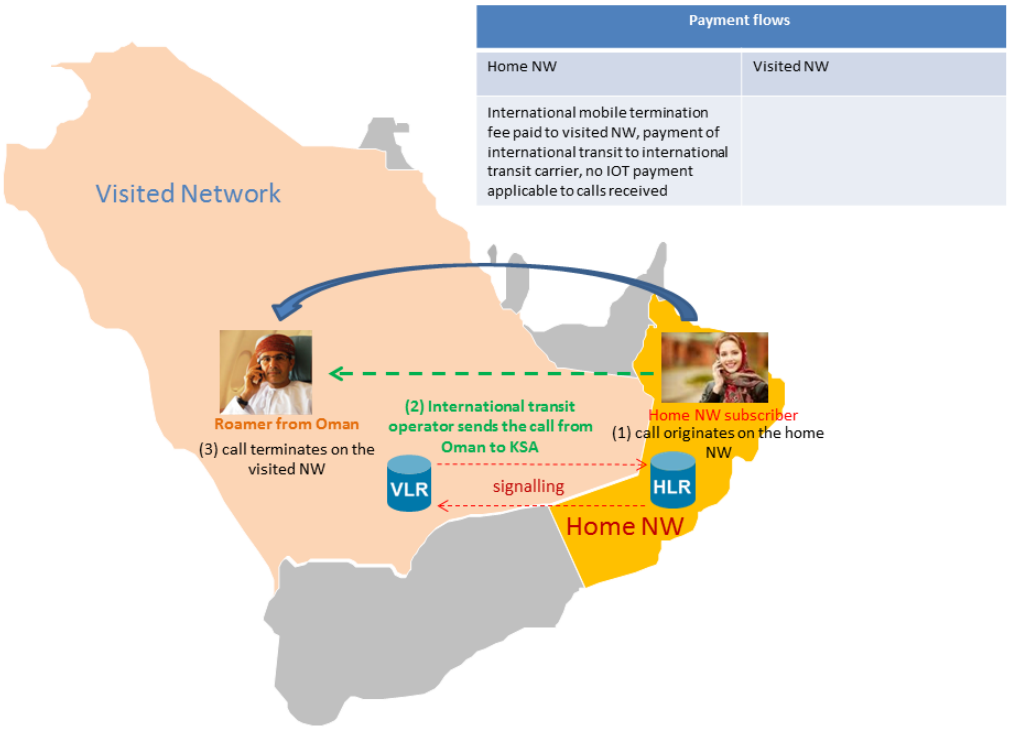
30. In Scenario 3, an Omani roamer makes a call to the United Kingdom while roaming in Saudi Arabia. The call originates on the visited network and is then routed via an international transit carrier to the United Kingdom instead of being terminated within Saudi .or any of the other GCC member states. In the case of an SMS, the SMS will also have to hub through the home network before reaching the destination network. Note that the red arrows mean signalling activity, while the green arrow shows the international transit portion of the call. Depending on the recipient's network and location, the call is terminated on one of the United Kingdom mobile or fixed networks.

31. As regards the charging mechanism for Scenario 3 (for both voice calls and SMS), the roamer's home network in Oman makes an IOT payment to the visited network in Saudi Arabia, which covers call origination and access, the arranging for and payment of international transit and termination on the end network. The visited network in Saudi Arabia is responsible for providing the call, and pays a transit fee to the transit operator and a termination fee to the fixed or mobile terminating network in the United Kingdom. Some visited network operators also make a bundled payment of transit and termination to the transit operator, who then passes on the termination fee to the terminating network, thereby creating a cascading billing structure. The Omani roamer makes a retail payment to his or her home network in Oman.

Scenario 4

32. Figure 4 illustrates Scenario 4, where calls are received by an Omani roamer from his home network while roaming in Saudi Arabia.

Figure 4 - Scenario 4 – Calls received from home in a visited country



33. In scenario 4, an Omani roaming in Saudi Arabia receives a call from his home country (in this case Oman). The call originates on the home network and is sent via the home network's preferred international transit carrier to the Saudi visited network for termination. Both networks are involved in technically placing the call. Note that the red arrows mean signalling activity, while the blue arrows show the direction of the call flow.

34. In terms of charging mechanism for a voice call received from home while roaming (Scenario 4), the visited operator generally charges the international transit operator an MSRN fee (mobile station roaming number)[10] for terminating the call, and the international transit operator then passes on the MSRN fee to the home network, together with any charges for transit costs incurred,[11] thereby creating a cascading billing structure. In most of the world, no wholesale IOT payment is applicable to calls received while roaming; however, the home network typically pays

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10 The MSRN is the temporary mobile service roaming number which is assigned by the VLR of the visited network to a roaming mobile and helps determine the location of the roaming mobile. The MSRN maps back to the original phone number being dialled. It is used for routing a call to a mobile station. The HLR of the home network will request the MSRN from the visited network's VLR. The need for the MSRN stems from the fact that the MSISDN (Mobile Station Integrated Services Digital Network Number) identifies a subscriber, but not the current location of that subscriber in a network. The MSRN is allocated to a subscriber during mobile termination call handling and is released when the call to that subscriber is established.

11 Some MNOs pay third parties for transit; others may have dedicated facilities. In either case, they incur costs for transit.

a mobile termination fee to the visited network (in the cascading manner described). In the GCC, however, some visited network operators charge a wholesale IOT for calls received, while others do not.

35. In terms of consumer payment, the caller in Oman typically pays the normal domestic price to his or her fixed or mobile network operator, which is appropriate since the caller does not necessarily know that the called party is roaming outside of Oman. A caller in some other country would generally pay the international direct dial calling charge for a call placed to Oman. Normally, the Omani roamer would make a retail payment to his or her home network in Oman. This unusual arrangement for roaming traffic differs from charging arrangements for non-roaming traffic inasmuch as it is one of the few instances where the recipient of a normal voice call (in a country subject to the calling party pays principle) is obliged to pay to receive the call. The visited network in Saudi Arabia is responsible for completing the call in this case. In the GCC, however, historically some home networks did not charge their customers at the retail level for calls received.

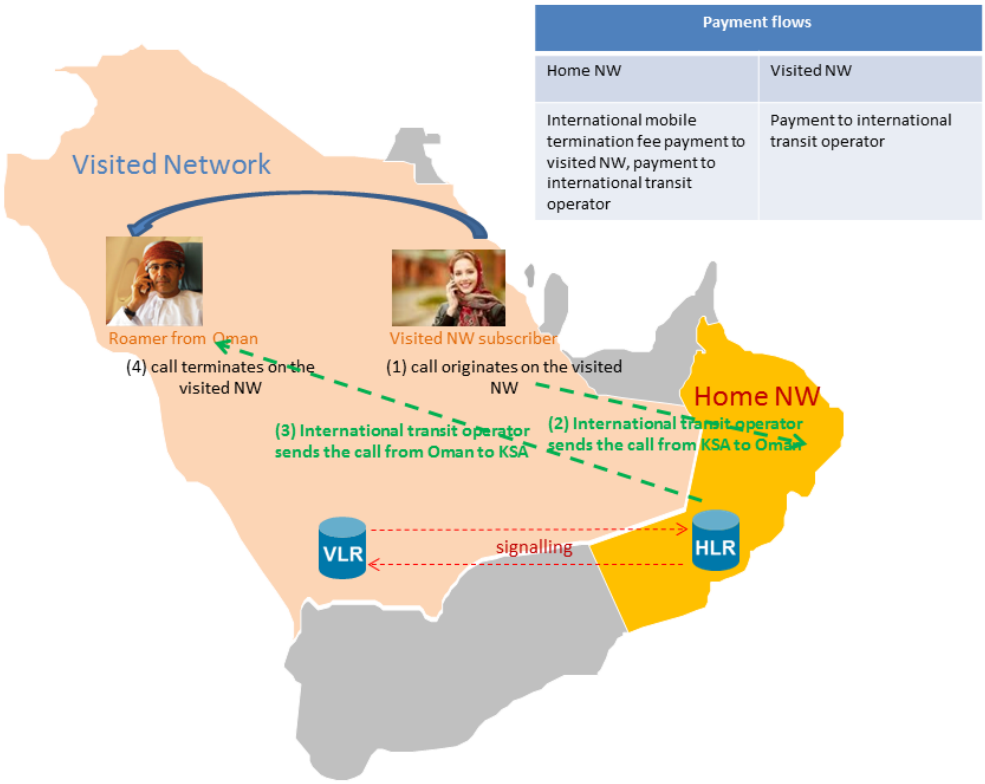
36. In contrast to incoming voice calls, there is no charge levied at wholesale or retail level for incoming SMSs received by GCC roamers.

Scenario 5

In this example, the subscriber in Saudi Arabia happens to subscribe to the visited network on which the Omani is roaming.

37. *Figure 5* illustrates Scenario 5, calls received by an Omani roamer from a Saudi network subscriber in Saudi Arabia. In this example, the subscriber in Saudi Arabia happens to subscribe to the visited network on which the Omani is roaming.

Figure 5 - Scenario 5 – Calls received from a subscriber of the visited country



38. In Scenario 5, the Omani roamer, while roaming in Saudi Arabia, receives a ‘local’ call from a Saudi network subscriber. The call both originates and terminates on the Saudi visited network;

however, both the home and visited network are technically involved in placing the call – i.e. the call hubs through the home network. (In the case of SMS, the involvement of the home network assumes that it has implemented SMS home routing). Note that the red arrows mean signalling activity, while the blue arrows show the direction of the call flow. The green dotted arrows show international transit. This scenario is also referred to as *tromboning*, as the call is first routed to Oman via an international transit operator and then back to Saudi Arabia, following the HLR query regarding the recipient's location.

39. In terms of charging mechanism for a voice call received from a subscriber of the visited country while roaming (Scenario 5), the visited network operator charges the international transit operator an MSRN fee for terminating the call and the international transit operator charges the home network operator for costs incurred. The home network operator also incurs international transit costs for sending the call back to Saudi Arabia. In most of the world, no wholesale IOT payment is applicable to calls received while roaming; however, the home network typically pays a mobile termination fee to the visited network. In the GCC, as previously noted, some visited networks charge the home network an additional IOT charge.

40. As regards consumer payment, the caller in Saudi Arabia pays the international direct dial price to his or her fixed or mobile network operator for a call to an Omani mobile number. This is the same payment that would have applied if the called party had been at home in Oman. The Omani roamer makes a retail payment to his or her home network in Oman, but only if retail charges apply.[12] (This is a feature of roaming arrangements that is different from most retail charging arrangements, where the called party typically does not pay for receiving the call.) The visited network in Saudi Arabia is responsible for completing the call in this case.

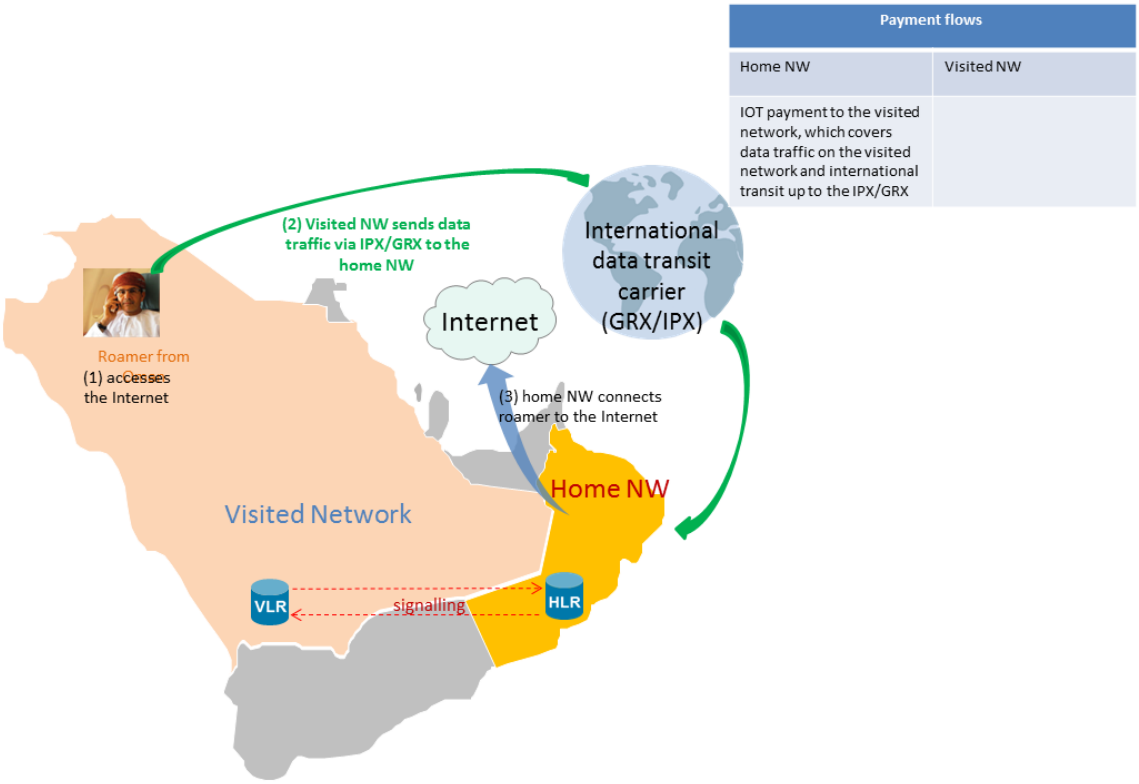
41. Once again, in contrast to incoming voice calls, there is no charge levied at wholesale or retail level for incoming SMSs received by GCC roamers.

Scenario 6

42. Figure 6 shows the generic process of an Omani customer accessing the Internet while roaming in Saudi Arabia.

12 As with calls received from home, historically some operators did not not charge their customers at the retail level for calls received while roaming.

Figure 6 - Accessing the Internet while roaming



43. When abroad and accessing the Internet via the mobile phone, the visited network establishes the connection to the roamer's home network. As with calls and SMS, the signalling between the visited network's Visitor Location Register (VLR) and the home network's HLR and the transfer of subscription data establishes the current location of the roamer. The visited network then sends the Internet traffic generated by the Omani roamer via an international transit data carrier to the roamer's home network. The home network operator connects the roamer to the Internet or the email account or other data services.

44. In terms of charging, the home operator pays an IOT to the visited network operator, which covers the origination and access cost of the visited network, the international data transit costs to deliver the data to the home network as well as any roaming overheads incurred by the visited network operator.

3.2 Technical aspects of roaming – systems and processes used in the GCC

45. Networks and technical support systems used by GCC operators for IMR do not differ to a significant degree from systems and networks used in other parts of the world. Roaming is provided primarily on the basis of 2G and 3G/3.5G networks.

46. LTE Roaming has begun to emerge in the GCC. The development of LTE Roaming in the GCC can be expected to follow the trends seen in other parts of the world.

47. In other parts of the world, such as North America and Europe,[13] the first LTE roaming agreements have been established, with a focus on data roaming very similar to the current data (GPRS) roaming scenarios where data is home routed. Because VoLTE (a packet-switched voice service that requires access to the *IP Multimedia Subsystem (IMS)* of the visited network) is not yet widely deployed, LTE voice roaming is a challenge. Most LTE operators – due to their predominantly 3G coverage – support voice today by means of *Circuit Switched Fall Back (CSFB)*.

48. All operators who responded to the questionnaire offer full pre-paid roaming services using the *CAMEL* protocol.[14] CAMEL for post-paid is applied by some operators to only distinct groups of customers (e.g. VPN), while some operators offer *Virtual Home Environment (VHE)*[15] to their post-paid customers.

49. Although not all MNOs responded in relation to traffic steering, it can be safely assumed that traffic steering is applied with roaming partners and/or networks with the required service offerings (GPRS, 3G data, or CAMEL).[16]

50. Moreover, a number of MNOs confirmed that they had real-time billing capabilities for post-paid customers, limited however to data. Some also added the caveat that this was only to support transparency measures. As regards real-time voice billing for calls made, this was not yet supported, and mainly still dependent on receiving accounting files (so-called *Transferred Account Procedure (TAP)* files[17]) from roaming partners.

51. In the GCC, there is not a uniform approach to *late call forwarding*[18] scenarios. One of the operators that responded has an optimal routing solution in place. Four operators (50% of the relevant responses) do not allow late call forwarding while roaming. Three operators have implemented late call forwarding with normal charging to the customers.

52. At least six MNOs confirmed that they made use of roaming Hubs.

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13 Telia Sonera has been a leader in this space. See for instance "TeliaSonera claims European 4G LTE roaming first", 27 February 2013, at http://www.eurocomms.com/industry-news/49-online-press/8898-teliasonera-claims-european-4g-lte-roaming-first.

14 CAMEL (Customised Applications for Mobile networks Enhanced Logic) is a set of standards designed to enable an MNO to define services over and above standard GSM and UMTS services. CAMEL is the typical means used to provide real-time visibility into call charges, which is crucial for the implementation of bill shock prevention for pre-paid users. CAMEL is typically thought of in conjunction with pre-paid services, but CAMEL can also be used with post-paid.

15 VHE offers an enriched roaming experience, where possible services include: support of short codes and dialled number correction.

16 Consultation responses raised the issue that traffic sterring may be less effective in LTE networks (where voice is handled via CSFB) that in 3G networks.

17 A TAP file contains information about the calls made by a roamer, and is sent by the visited network to the home network.

18 *Late Call Forwarding* is the scenario where the roaming customer is in conversation ("busy"), not answering the phone ("no reply"), or not reachable without the Home Network having received a notification (in technical terms "out of reach before IMSI detach"). This is also referred to as conditional call forwarding. Without intelligent optimal routing solutions this scenario results in a call towards the visited network ("leg 1") and a forwarding ("leg 2") towards the home network (voicemail platform usually). In the EU call forwarding to voicemail is not allowed to be charged. To prevent having to bear the costs of the terminating call (including interconnect) and the originating call while roaming (forwarding) EU operators have implemented intelligent solutions which result in a forwarding directly to voicemail and bypassing the setup of two international calls.

4 Characteristics of roaming markets in the GCC

53. This section describes the characteristics of the retail and wholesale markets for IMR services at the aggregate GCC level and in each of the GCC member states.

4.1 Methodology

54. This report (like the Consultation Document) tries to strike a balance between being as transparent as possible while rigorously avoiding disclosure of sensitive MNO data.

55. In particular, the "Visited Network" methodology adopted in the analysis and presentation of empirical evidence (where data is consolidated from all MNOs in the GCC region) helps to mask the information of individual operators.

56. The analysis of IMR across the GCC is primarily based on a survey carried out on MNOs in the region. Where necessary, clarifications were sought from the MNOs. MVNOs were also surveyed, but the information that they provided turned out to have only limited direct bearing on the results of the consultation. Additional information was gathered through desk research and interviews, especially in the course of the kick-off meeting conducted on 8 and 9 September 2013. For the interpretation of data, the RWG has also made use of the consultant's experience as well as available benchmark results based on international experience.

57. In the survey, which was launched in the third quarter of 2013, MNOs in the GCC region were requested to provide detailed information about their outbound roamers[19] (on the so-called *Visited Network*).

58. The operators were asked to provide data since Q1 2010 to enable a well-founded analysis of the effects of the roaming regulation.

59. The presentation of the results generally follows a "visited network perspective". The following data were collected and assessed:

    a) **Traffic Volumes,** which are used to analyse the roaming traffic generated by subscribers while roaming in a visited GCC member state, and to calculate average IOTs and average revenues per unit.

    b) **Inter-Operator Tariffs (IOTs),** which refer to wholesale payments made by home networks to visited networks. Strictly speaking, the term IOT covers only certain payments made for outgoing voice calls, outgoing SMS, and outgoing/incoming data; however, for simplicity's sake and to reflect a wider use often found in the roaming literature, the term is used broadly in this document in order to also reflect payments made under special negotiated roaming arrangements and to also includes payments (if any) made for incoming voice calls and incoming SMS.

    c) **Revenues,** which refer to retail revenues earned by GCC operators from their subscribers (outbound roamers) paying retail prices for roaming on a visited network.

60. *Table 2* provides an overview of the perspective of different operators on roaming activities in a country, and refers to the key terms used in this document to describe the IMR environment.

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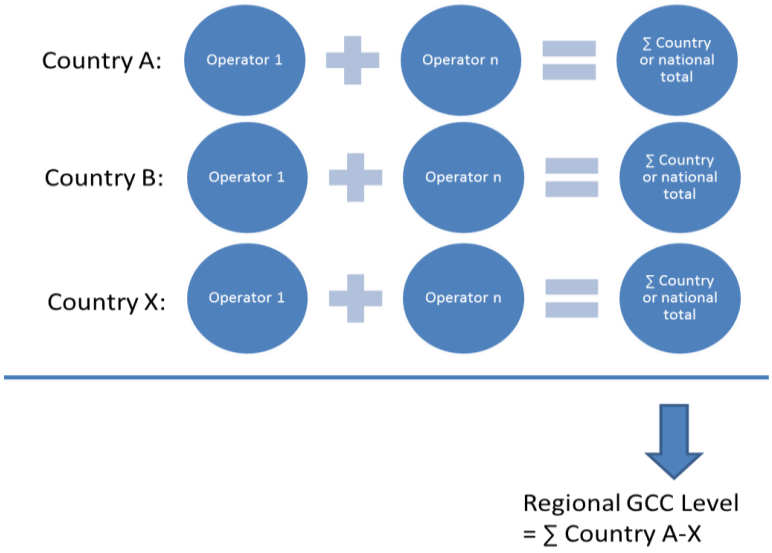
19 *Outbound roamers* refers to MNO subscribers roaming in a foreign country.

Table 2 - Roaming activities in country A from the perspective of different operators

	Network in Country A	Roamers in Country A	Type of Market in Country A	Type of Revenues generated in Country A
Operator from country A	Home Network	Inbound Roamers	Wholesale Market	Wholesale payments by operators from other countries
Operators from other countries	Visited Network	Outbound Roamers	Retail Market	Retail prices paid by subscribers

61. In a first step, as illustrated in Figure 7, the inbound roaming activity was aggregated (traffic, IOTs and revenues) for each GCC member state (Bahrain, Kuwait, Oman, Qatar, Saudi Arabia (KSA) and the United Arab Emirates (UAE)).[20] This data is presented from a visited network perspective and shows the activities of inbound roamers in each country. Then the average IOTs and revenues for each service for each visited GCC member state were assessed. In a second step, national results were aggregated to show results at GCC level.

Figure 7 - Graphical illustration of quantitative aggregation "visited networks perspective"



62. In order to ensure the confidentiality of the information provided by the network operators, only aggregated data and values are presented.

20 Some currency conversion was required, as several operators provided information in local currency.

4.2 Information characteristics and shortcomings

63. Information was eventually provided by all fifteen GCC mobile network operators. Many of the operator responses were incomplete in one aspect or another, as not all operators could gather the information in the requested detail from their systems. The RWG has decided to fill in the data gaps wherever reasonable estimation was possible.

64. Adjustments were required for the MNOs that implemented late.

65. Key limitations regarding the data received include:

- **The information provided by the network operators was for the most part limited to the period Q1 2012 – Q2 2013.** The questionnaires asked for quarterly information from 2010 to the first half of 2013; however, only a small number of operators provided information for the whole period. It was therefore impractical to analyse periods other than from the first quarter of 2012 to the second quarter of 2013.
- **The network operators had little or no data available for a number of services**, such as MMS, video calls, and SMS received.
- **Information on costs was very limited,** mostly limited to IOTs paid to the visited network operators.

66. These limitations affect the results in the following ways:

a) The analysis necessarily reflects various assumptions and estimates used to fill in gaps and to compensate for anomalies.

b) *Total* values for all operators were calculated reflecting various RWG estimates. By contrast, *average* revenues and *average* wholesale costs have been calculated based solely on information provided by those network operators who provided relevant data. Given that information on volumes, revenues and costs could not be calculated under identical assumptions; there is uncertainty as to the margins that the network operators are realising.

c) Due to the nature of available data as well as the relative priority of the different services being reviewed, the analysis was carried out only for outgoing and incoming voice, roaming data, and outgoing SMS. MMS, video calls, and SMS received were not analysed.

d) There were limitations in our ability to assess the effects of the current regulation, since the pre-regulation status cannot be constructed after the fact.

e) In light of limited information from the MNOs about detailed costs, we made greater use of benchmarks from other regions in the world than we would have ideally chosen to do.

4.3 Wholesale versus retail roaming activities

67. As with many telecommunication services, any analysis must clearly distinguish between retail and wholesale activities (see also Table 2). An informal definition suffices for the purposes of this report:

- **Retail roaming activities:**
    - These are roaming activities that are chosen and paid for by an end-user customer, i.e. a customer that does not intend to re-sell the service to third parties. The end-user customer might be a consumer acquiring and using services for his or her own

use, or might be an employee or businessman acquiring and using mobile services for the benefit of his or her firm.

- The mobile operator to whom the end-user pays his or her retail roaming fees is known as the “home network”. From the home network’s perspective, the end-user who uses retail roaming services while abroad is known as an “outbound” roamer who generates retail revenues.

- **Wholesale roaming activities:**
  - These are activities that are paid for by a home network to a foreign operator, to ensure that its outbound roamers are able to use roaming services.
  - The mobile operator to whom the home network pays its wholesale roaming fees is known as the “visited network”. From the visited network’s perspective, the end-user who enters its territory is known as an “inbound” roamer who generates wholesale revenues.

4.4 The GCC as a whole

68. This section presents roaming activities in the GCC region for outgoing voice, incoming voice, data and SMS services. It presents volumes of traffic, retail IMR revenues, and IOT payments for each service.

    Data from the MNO survey are shown (1) as full year results for 2012 for the total GCC region and the GCC member states, and (2) as a time series per quarter by GCC member state for the period analysed (Q1 2012-Q2 2013). The RWG intended to analyse data before 2012 to conduct a well substantiated evaluation of the current regulation; however, the MNOs were able to provide only limited data of uncertain quality for years before 2012.

69. As indicated in Section 4.2, total traffic, revenue and IOTs are calculated for all 15 MNOs in the GCC region, but include some estimates for missing or implausible data.

70. As explained in Section 4.1 and as shown in *Table 2*, from an MNO’s perspective, the retail market refers to the roaming activities of outbound roamers (its own subscribers) generating traffic on the visited network (i.e. the network of a mobile network operator in a foreign country). The operator receives retail revenues from the retail payments made by its subscribers.

71. From an MNO’s perspective, the wholesale market refers to the roaming activities of inbound roamers, i.e. mobile subscribers of operators from a foreign country. The visited network operator receives wholesale revenues reflecting the wholesale prices paid to it by other MNOs.

4.4.1 Roaming Volumes

72. In this section, roaming volumes for outgoing voice, incoming voice, data and outgoing SMS services are presented. The following graphs refer to the data provided by operators (see Section 4.2). In the absence of some data from some of the MNOs, the RWG has decided to either base the finding on assumptions, or to use relevant data available from other MNO’s submissions.

73. The data is presented so as to demonstrate the total volume and the main trends over time. Due to seasonality, comparisons are primarily relevant between Q1 2012 versus Q1 2013, and between Q2 2012 versus Q2 2013.

74. The total ***outgoing voice*** traffic (i.e. calls that roamers make, in minutes) generated by roamers in the GCC region in 2012 totalled more than 200 million minutes (see *Figure 8*). Most of the

roaming traffic was generated by GCC roamers while roaming in the UAE, followed by Saudi Arabia and Bahrain. A comparison between the corresponding quarters of 2012 and 2013 shows a small increase (roughly 11%) in outgoing voice traffic year over year (see *Figure 9*).

Figure 8 - OUTGOING VOICE (CALL MINUTES MADE WHILE ROAMING) – Total traffic generated in the GCC region and in the different visited networks (in minutes, 2012)

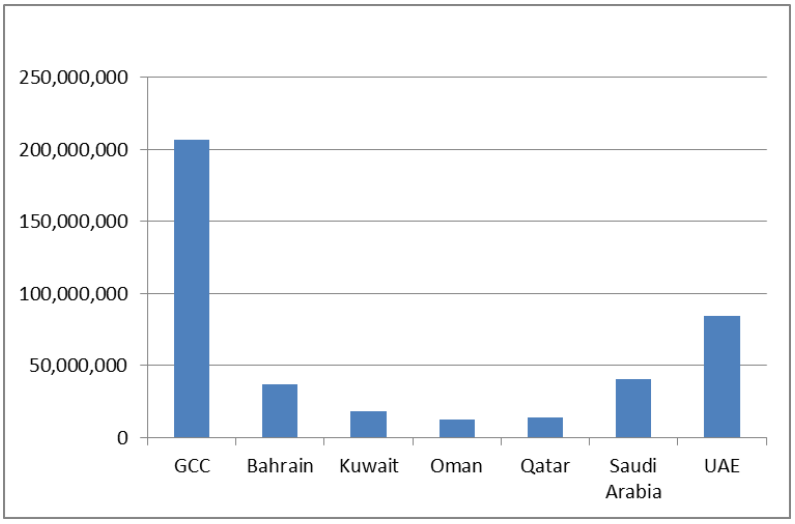
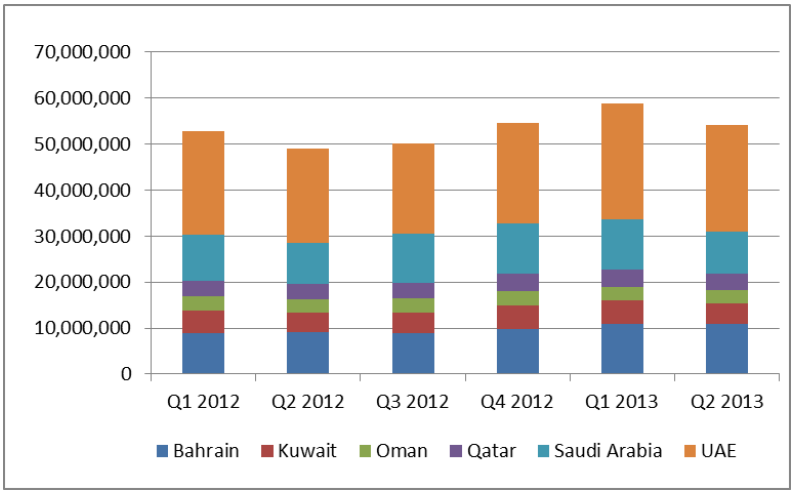


Figure 9 - OUTGOING VOICE (CALL MINUTES MADE WHILE ROAMING) – Development of total traffic generated in the GCC region and in the different visited networks (in minutes, Q1 2012 – Q2 2013)



75. A different traffic distribution can be observed for ***incoming voice*** traffic (i.e. calls that roamers receive, in minutes). The total was slightly in excess of 180 million minutes in 2012 (see Figure 10). Most traffic was generated in Saudi Arabia, followed by the UAE. The incoming voice traffic in Saudi Arabia was characterized by huge volumes in Q1 and Q2 2012, apparently as a result of certain GCC MNOs offering free calls for their roamers on selected visited networks in Saudi Arabia for a limited period of time. In Q1 2012 alone, more than 60 million minutes of voice were

received by GCC roamers (see *Figure 11*). Once these special offers were no longer available, traffic decreased markedly to a level of between 30 and 40 million minutes per quarter.

Figure 10 - INCOMING VOICE (CALL MINUTES RECEIVED WHILE ROAMING) – Total traffic generated in the GCC region and in the different visited networks (in minutes, 2012)

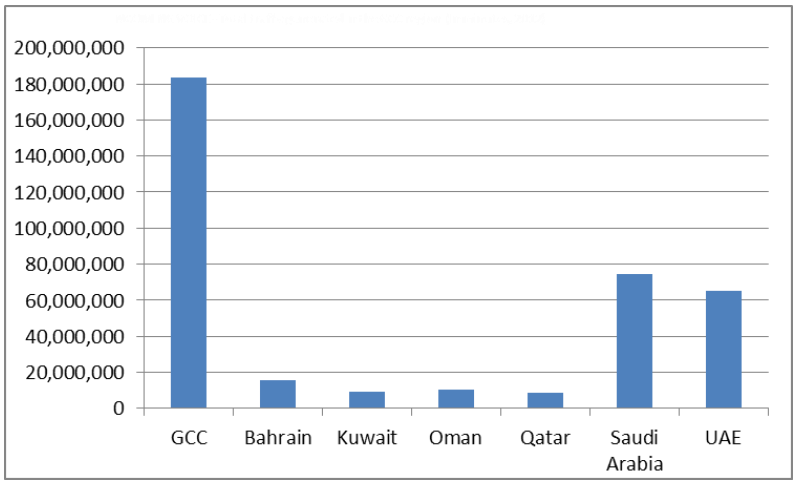
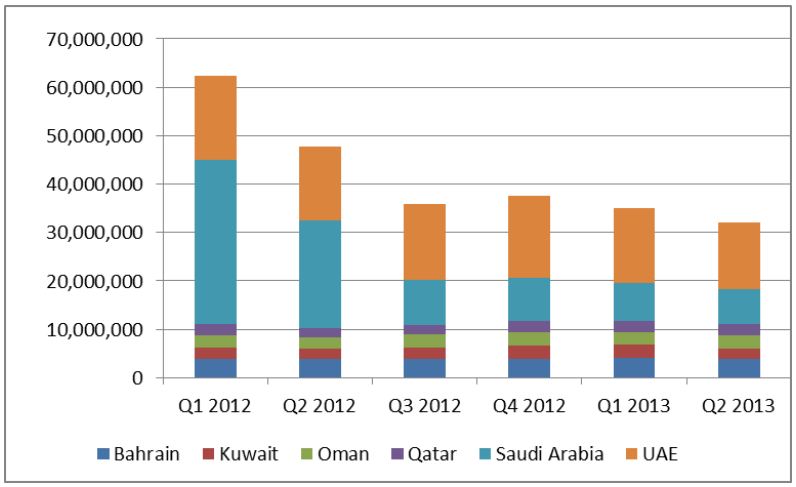


Figure 11 - INCOMING VOICE (CALL MINUTES RECEIVED WHILE ROAMING) – Development of total traffic generated in the GCC region and in the different visited networks (in minutes, Q1 2012 – Q2 2013)



For ***data*** roaming, almost 70 million MBs were generated in the GCC, with GCC roamers generating most of the data traffic in the UAE, followed by Kuwait and Saudi Arabia (see Figure 12). Due presumably to increased smartphone penetration and usage of mobile data applications, data traffic in the GCC continuously increased between Q1 2012 and Q2 2013 (see

76. *Figure 13*). Roaming data usage can be expected to continue to grow due to the increasing demand for *Over-the-top (OTT)* services on the part of end user customers.

Figure 12 - DATA (DOWNLOADED OR UPLOADED WHILE ROAMING) – Total traffic generated in the GCC region and in the different visited networks (in MB, 2012)

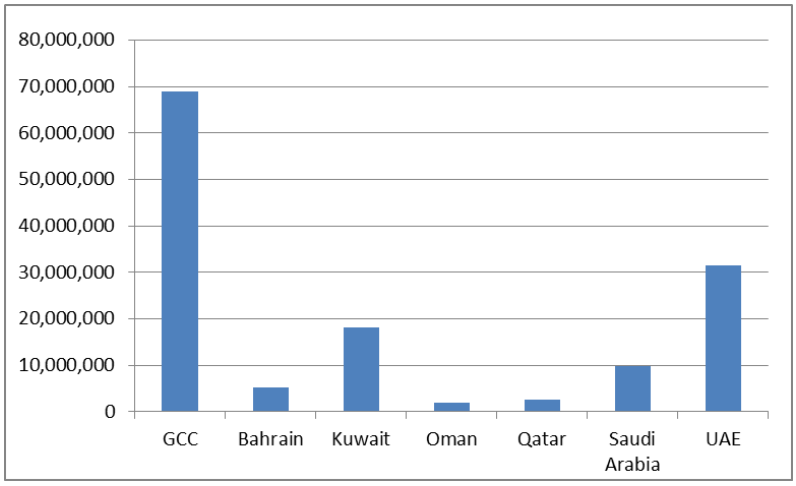
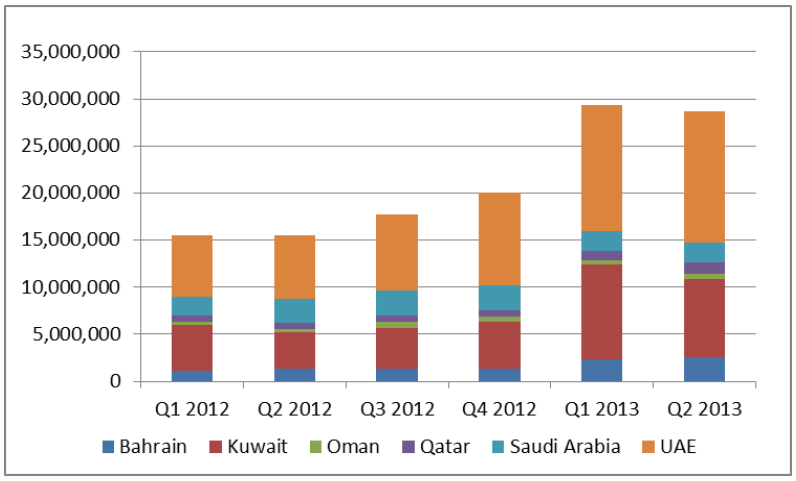


Figure 13 - DATA (DOWNLOADED OR UPLOADED WHILE ROAMING) – Development of total traffic generated in the GCC region and in the different visited networks (in MB, Q1 2012 – Q2 2013)



77. With regard to outgoing ***SMS*** roaming traffic (i.e. SMS messages that roamers send), more than 70 million SMS were sent in the GCC by GCC roamers, of which most outgoing SMS were sent in the UAE, followed by Saudi Arabia (see Figure 14). The volume of SMS has tended to decline during recent years, as they are presumably being substituted for to some extent by applications such as “WhatsApp” (see *Figure 15*).

Figure 14 - SMS (NUMBER OF SMS SENT WHILE ROAMING) – Total traffic generated in the GCC region and in the different visited networks (2012)

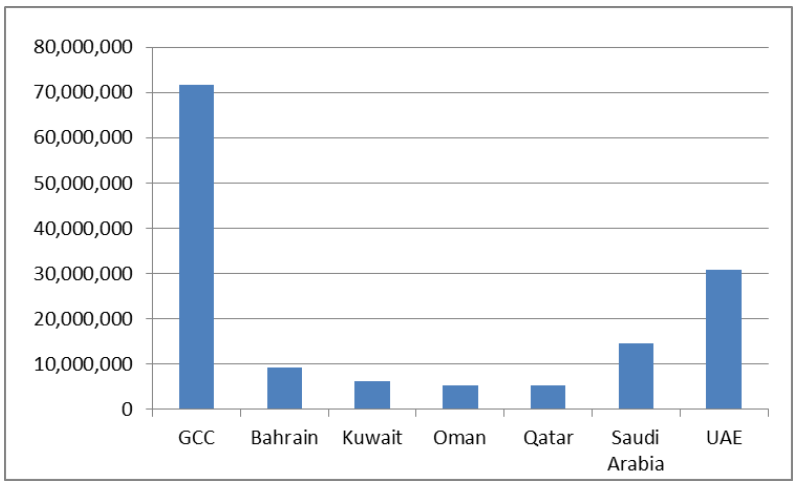
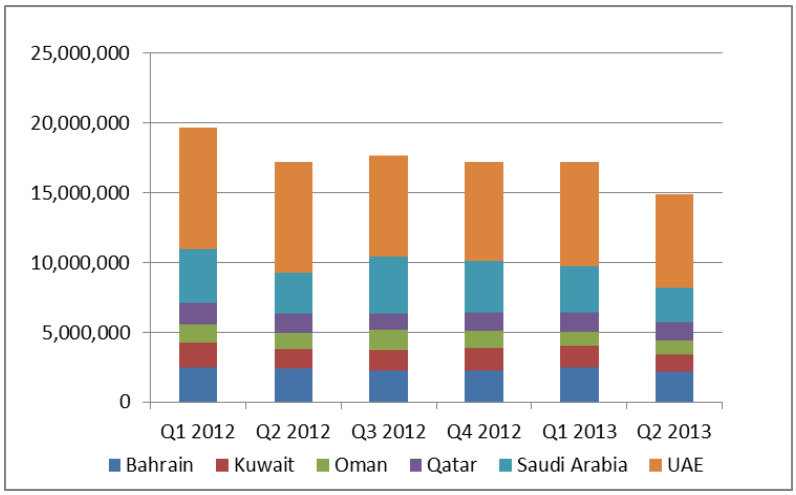


Figure 15 - SMS (NUMBER OF SMS SENT WHILE ROAMING) – Development of total traffic generated in the GCC region and in the different visited networks (Q1 2012 – Q2 2013)



4.4.2 Retail roaming activities and revenues in the GCC

78. The following findings are based primarily on the responses received from the MNOs in the data collection phase, together with subsequent clarifications and input from the consultation responses.

79. Across the GCC, the full suite of IMR services is offered at the retail level for voice, data, SMS and MMS.[21] Most GCC MNOs offer

- standard services for pre-paid and post-paid roaming;
- GCC specific offers;

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21 Video calling is also offered by some GCC operators as a roaming service; however, this service is not further analysed in this consultation. Based on questionnaire responses, the volume appears to be small.

- a wide range of cost-effective special offers; and
- monthly travel passes including some amount of minutes / SMS / MMS or MBs.

80. The survey data strongly suggests that all GCC MNOs complied with the regulatory price caps by February 2012.[22]

81. It appears that most customers use standard tariff schemes. Most MNOs report that take-up of special packages is low (1%-5%); however, some MNOs report that up to 30% of their customers choose bundles.

82. Roaming services in the GCC are generally a default opt-out service sold together with the domestic subscription for pre-paid customers, but an opt-in service for post-paid customers.

83. In terms of competitive dynamics at the retail level, most operators stated that they were aware of roaming offers by direct competitors at national level. Some confirmed that they considered competing offers and monitored them when developing and designing own offers, some stated that they were aware of competing offers but did not take them into consideration. Operators further confirmed that there are no direct substitutes for roaming in the GCC; however, a number of indirect substitutes are used by consumers ("plastic roaming"[23], OTT applications in conjunction with Wi-Fi offload, and local number offered to visited country roamers). Nonetheless, none of the operators are monitoring the use of indirect substitutes and its impact on roaming traffic.

84. In total, ***outgoing voice*** roaming generated about 200 million USD in retail revenues in the GCC region (2012) (see Figure 16). The majority of total outgoing voice revenue was generated in the UAE and Bahrain as visited countries .

    The reduction of retail prices appears to have led to a slight decrease in revenues, which is visible in a comparison between Q1 2012 and Q1 2013 as well as in comparison between Q2 2012 and Q2 2013 (where corresponding quarters are compared so as to take seasonal effects into account) (see *Figure 16*).

22 Most mobile operators implemented the regulation on time, and all by September 2012.

23 *Plastic roaming* occurs when an end user who would otherwise be roaming acquires and uses a SIM card from a mobile network operator in the visited country in order to obtain mobile services at domestic prices.

Figure 16 - OUTGOING VOICE (CALL MINUTES MADE WHILE ROAMING) – Total retail revenue generated in the GCC region and in the different visited networks (in US Dollars, 2012)

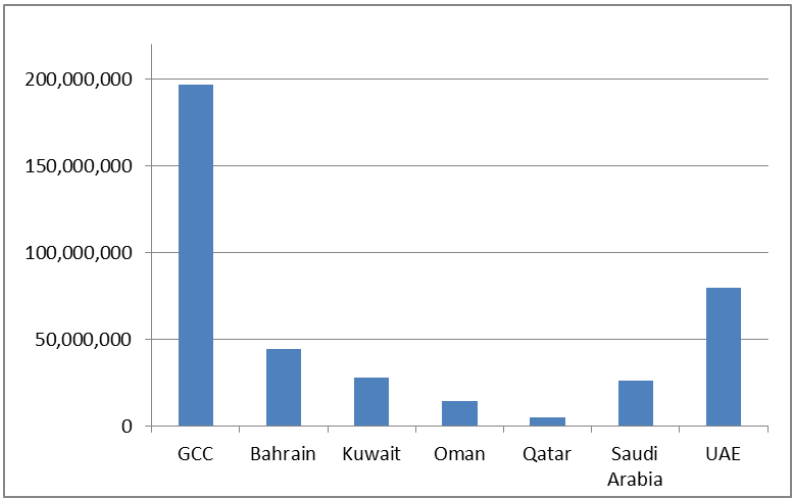
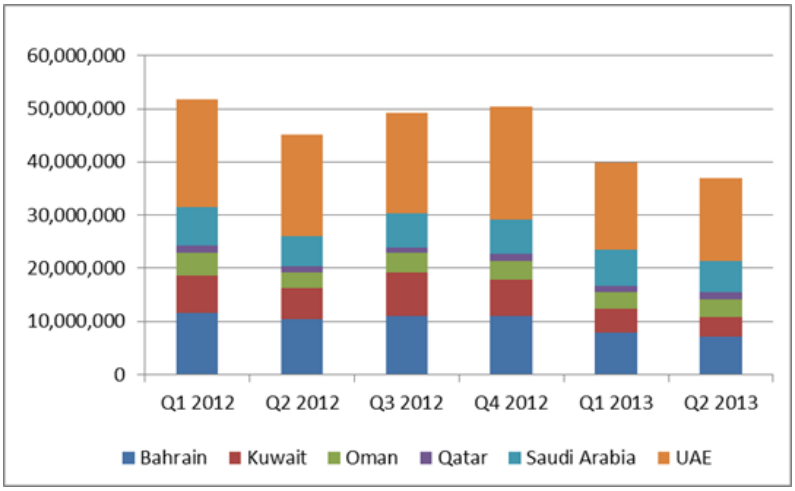


Figure 17 - OUTGOING VOICE (CALL MINUTES MADE WHILE ROAMING) – Development of total retail revenue generated in the GCC region and in the different visited networks (in US Dollars, Q1 2012 – Q2 2013)



85. In total, it can be estimated that about 110 million USD in retail revenues were generated by incoming voice roaming in the GCC region in 2012 (see Figure 18).[24] Most revenues were generated by roamers in UAE visited networks, followed by Bahrain.

86. Since the beginning of 2012, the overall revenues declined, presumably caused by a traffic decrease (see Figure 19). As noted in 4.4.1, this traffic development was mainly impacted by the traffic peak in the visited network Saudi Arabia.

24 Note that not all GCC MNOs charge their roamers for incoming IMR calls within the GCC under all circumstances.

Figure 18 - INCOMING VOICE (CALL MINUTES RECEIVED WHILE ROAMING) – Total retail roaming revenues generated in the GCC region and its different visited networks (in US Dollars, 2012)

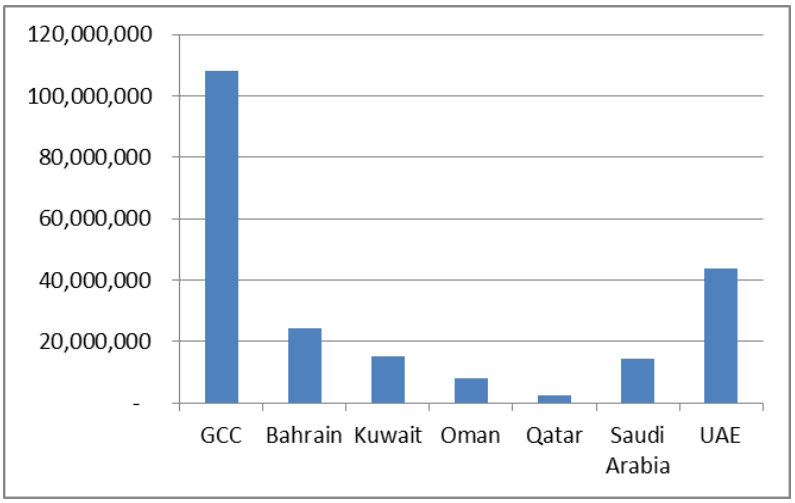
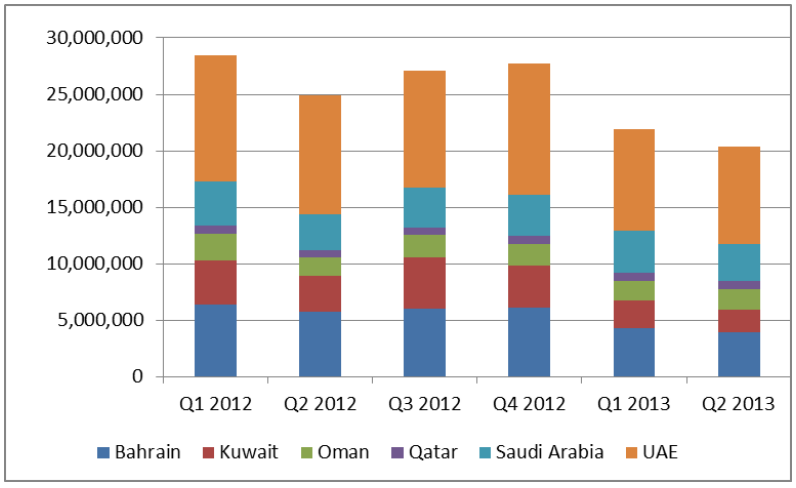


Figure 19 - INCOMING VOICE (CALL MINUTES RECEIVED WHILE ROAMING) – Development of total retail roaming revenues generated in the GCC region and its different visited networks (in US Dollars, Q1 2012 – Q2 2013)



87. The total roaming revenues for ***data*** were more than 400 million USD in the whole GCC region during 2012 (*see Figure 20*). The highest share of data roaming traffic was generated by roamers in Kuwait in 2012.

88. Total data revenues in the GCC region increased in the time period between Q1 2012 and Q2 2013 (see *Figure 21*). This increase was caused by the significant growth in data traffic, since the average revenue per MB in the GCC region was reduced by 30% since Q1 2012.

Figure 20 - DATA (DOWNLOADED OR UPLOADED WHILE ROAMING) – Total retail roaming revenues generated in the GCC region and in the different visited networks (in US Dollars, 2012)

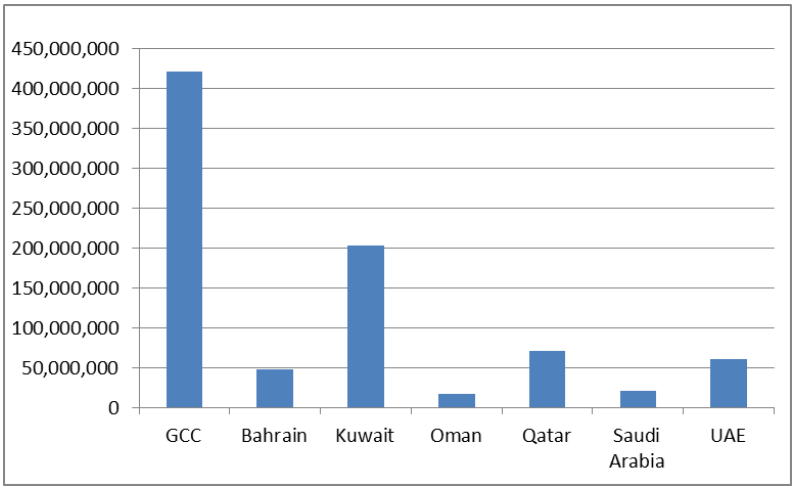
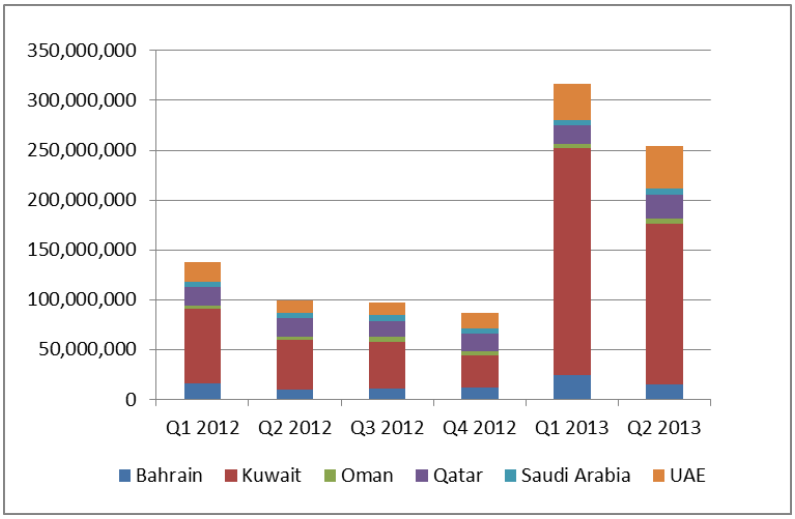


Figure 21 - DATA (DOWNLOADED OR UPLOADED WHILE ROAMING) – Development of total retail roaming revenues generated in the GCC region and in the different visited networks (in US Dollars, Q1 2012 – Q2 2013)



89. In total, about 33 million USD retail revenues were generated by ***SMS*** roaming in the GCC region in 2012 (see Figure 22). Most revenues were generated with roamers in the visited network UAE, followed by Bahrain.

90. Since the beginning of 2012, the overall SMS roaming revenues decreased in the GCC region (see *Figure 23*). This development was mainly caused by falling traffic volumes, while the average revenues per SMS remained roughly stable.

Figure 22 - SMS (SMS SENT WHILE ROAMING) – Total retail roaming revenues in the GCC region and in different visited networks (in US Dollars, 2012)

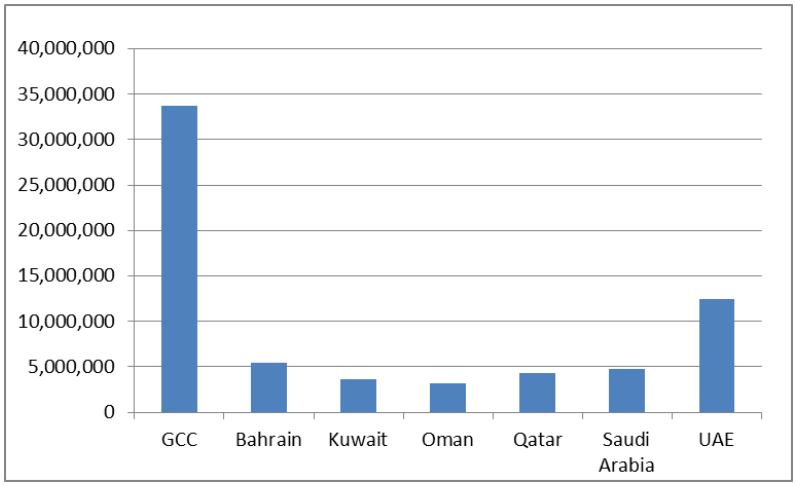
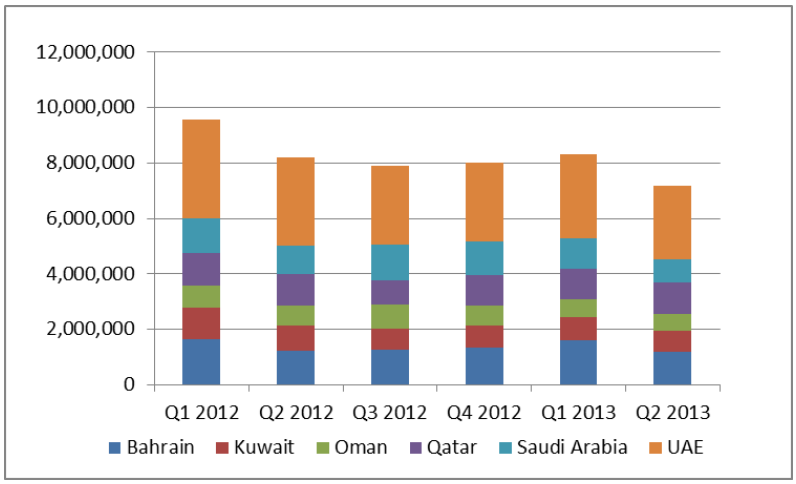


Figure 23 - SMS (NUMBER OF SMS SENT WHILE ROAMING) – Development of total retail roaming revenues in the GCC region and in different visited networks (Q1 2012 – Q2 2013)



4.4.3 Wholesale roaming activities and wholesale (IOT) payments in the GCC

91. Most MNOs in the GCC region appear to have relationships with most if not all of the other GCC operators. The nature of the relationship is bilateral. No significant impediments were identified at the wholesale level; however, many observed that the amount of traffic that one operator can steer to another typically determines the degree of bargaining power over IOTs. Many of the MNOs spoke of an IOT discount regime where discounts are computed at the end of one year, or quarter, or month on the total volume of traffic exchanged in that period.

92. The following paragraphs relate to wholesale IOTs for the different services at GCC level.[25]

---

25 Total IOTs paid by GCC MNOs to other GCC MNOs have been calculated for all 15 GCC MNOs, reflecting GCC RWG estimates where data were not provided. Average IOTs per unit have been calculated based on the responses received from a subset of MNOs, many of which are smaller MNOs. Average IOTs paid may be overstated, as they exclude the larger MNOs.

93. In aggregate, more than 140 million USD were paid in the GCC region in 2012 for ***outgoing voice*** IOTs (see Figure 24). The highest amount of IOTs for outgoing voice services was paid to Emirati operators, followed by Bahraini operators.

94. Between Q1 2012 and Q2 2013, overall IOTs for outgoing voice in the GCC region decreased (see *Figure 25*).

Figure 24 - OUTGOING VOICE (CALL MINUTES MADE WHILE ROAMING) – Total wholesale roaming charges in the GCC region and in different visited networks (in US Dollars, 2012)

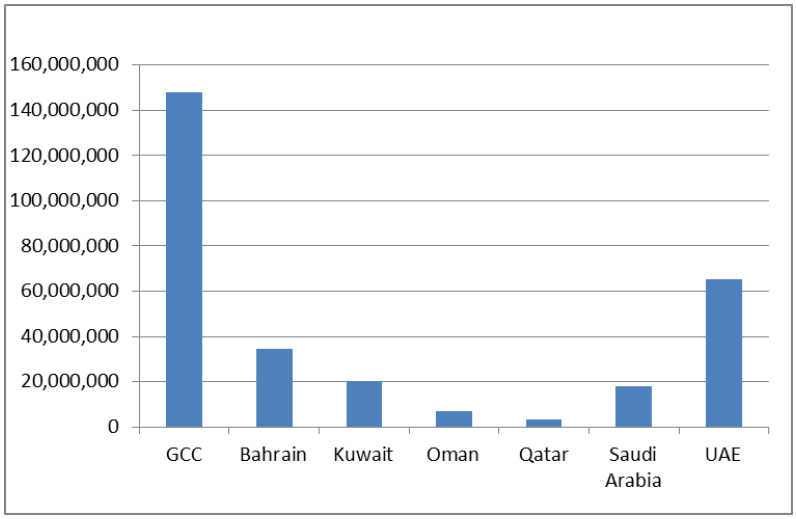
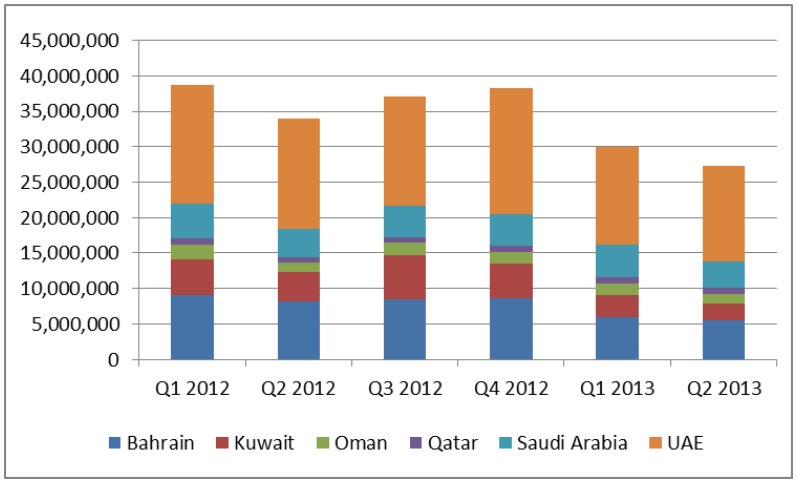


Figure 25 - OUTGOING VOICE (CALL MINUTES MADE WHILE ROAMING) – Development of wholesale roaming charges in the GCC region and in different visited networks (in US Dollars, Q1 2012 – Q2 2013)



95. For ***incoming voice*** (i.e. calls that roamers receive), most home networks do not pay any IMR-specific wholesale IOTs to visited networks; there are, however, exceptions. What all home networks pay to the visited network is a mobile termination fee (as the visited network must of course terminate the incoming call that has been hubbed to it from the home network); however,

this termination fee is typically paid by the home network's interconnection team, rather than by the home network's IMR team.

96. Regarding ***data*** services, in total almost 350 million USD were paid for IOTs in the GCC region (2012) (*see Figure 26*). Most IOTs were paid to operators in the visited network Kuwait due to the high amount of data traffic generated in this GCC member state.

97. Between Q1 2012 and Q2 2013, total data roaming IOTs in the GCC region increased (*see Figure 27*). A significant growth can be observed in Q1 2013, mainly caused by strong increase in total IOTs paid to the visited networks in Kuwait.

Figure 26 - DATA (DOWNLOADED OR UPLOADED WHILE ROAMING) – Total IOTs paid in the GCC region and in the different visited networks (in US Dollars, 2012)

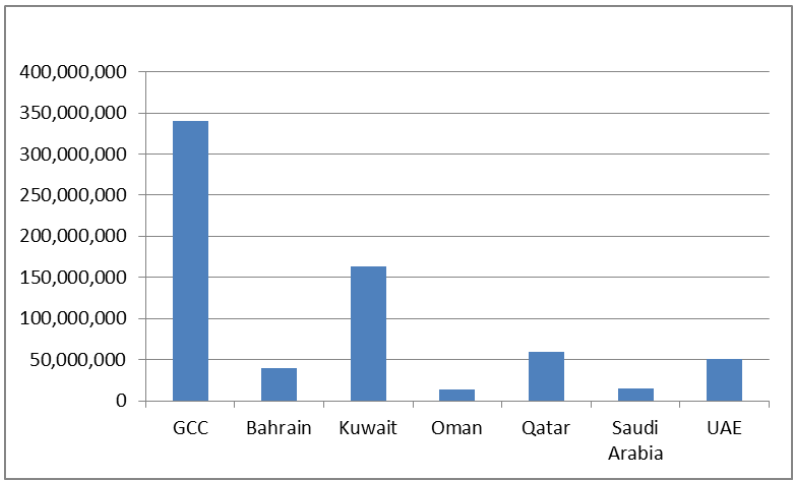
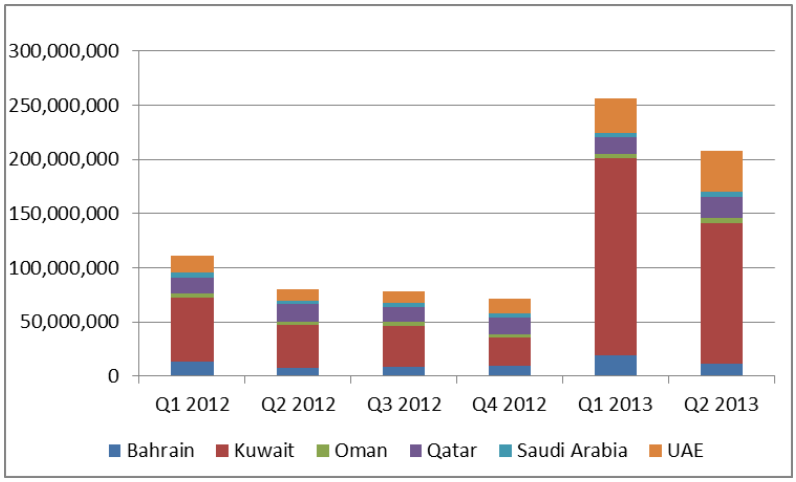


Figure 27 - DATA (DOWNLOADED OR UPLOADED WHILE ROAMING) – Development of total IOTs paid in the GCC region and in the different visited networks (in US Dollars, Q1 2012 – Q2 2013)



98. For ***SMS sent***, operators paid more than 25 million USD for IOT in 2012 (Figure 28).

99. The total IOT for SMS decreased across the GCC region since the beginning of 2012, mainly due to a decline in SMS traffic (*see Figure 29*).

Figure 28 - SMS (NUMBER OF SMS SENT WHILE ROAMING) –Total IOTs paid for outgoing SMS in the GCC region and in the different visited networks (in US Dollars, 2012)

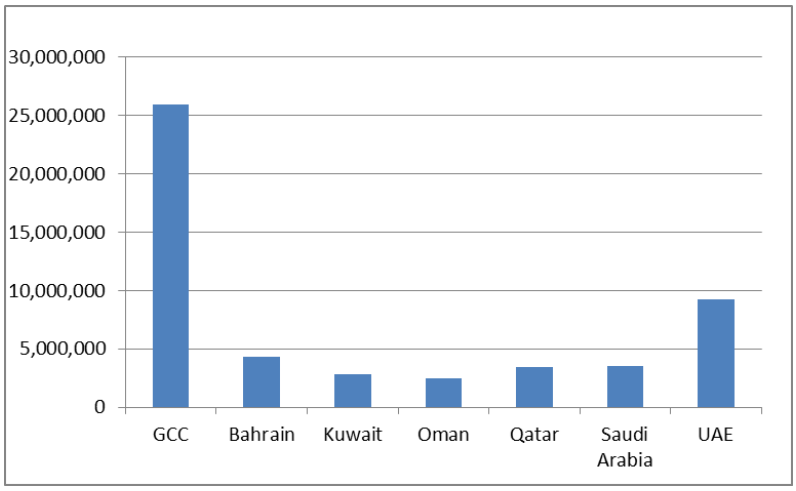
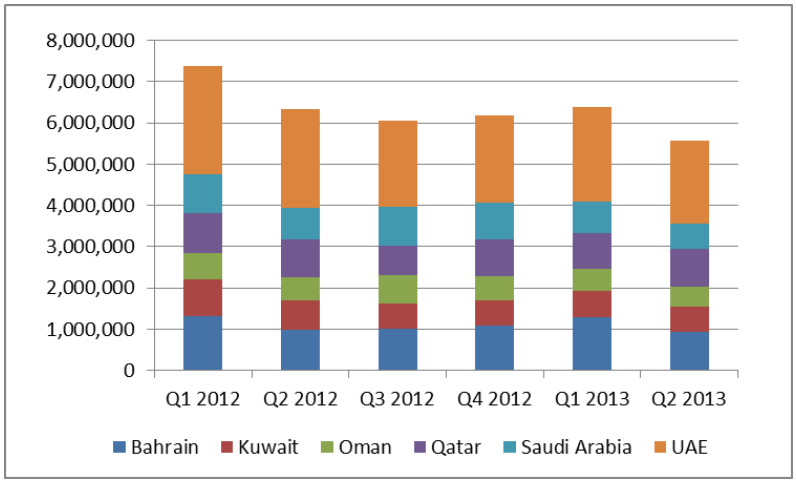


Figure 29 - SMS (NUMBER OF SMS SENT WHILE ROAMING) – Development of total IOTs paid for outgoing SMS in the GCC region and in the different visited networks (in US Dollars, Q1 2012 – Q2 2013)



4.4.4 Summary of empirical findings for the GCC as a whole

100. Overall, the findings for the GCC as a whole are as shown in the table below.

Roaming volumes:

- Roaming traffic tends to slightly increase for outgoing voice services in the GCC region.
- Incoming voice traffic experienced peaks in Q1 2012 and Q2 2012 due to special offers by two GCC operators to their outbound roamers in Saudi Arabia.
- As in other parts of the world, data traffic has continuously increased since the beginning of 2012, while SMS traffic went down.
- The greatest volume of IMR traffic for all roaming services analysed is generated in the UAE (with the exception of incoming voice traffic).

Retail roaming revenues:

- In the GCC region, the full range of IMR services for voice, data and SMS is offered.
- Retail roaming revenues for outgoing voice can be estimated to total about 200 million USD in 2012. The slight increase (roughly 11% year over year) in outgoing roaming voice traffic did not fully compensate for the decline in unit price over the period.
- Incoming voice roaming revenues were about 110 million USD in 2012, characterised by a decrease during the year after a peak in Q1 2012 and Q2 2012.
- Data roaming revenues totalled more than 400 million USD in the whole GCC region in 2012, and increased from the beginning of 2012 due to traffic growth.
- SMS roaming revenues declined due to a traffic decrease coupled with stable prices per SMS sent, and reached about 34 million USD in 2012.

Wholesale charges/IOT payments:

- In 2012, about 140 million USD in IOT payments were made across the GCC region for outgoing voice roaming services.
- For incoming voice, most operators do not pay any IMR-specific wholesale charges; there are, however, exceptions.
- IOT payments made for data roaming services across the GCC totalled about 350 million USD in 2012.
- For roaming SMS sent, IOT payments were about 25 million USD in total in 2012.

4.5 The GCC region by member state

101. This section provides an overview of national IMR markets in the GCC region. Retail and wholesale roaming are described briefly based on the qualitative information received in the MNO survey and in the consultation responses. Retail roaming activities refer to the type of roaming services offered, and to the availability of roaming substitutes. Regarding wholesale activities, national characteristics of IOT agreements are described. No quantitative information is provided in order to avoid the risk of revealing confidential data of individual MNOs.

4.5.1 Bahrain

4.5.1.1 Retail roaming activities in Bahrain

102. In an apparently very competitive domestic mobile market, Bahraini customers can take up mobile services with three different operators (Batelco, Viva Bahrain and Zain Bahrain), who all offer roaming as part of their mobile service bundle. Roaming cannot be purchased separately from general mobile service. Offers consist of standard per unit tariffs and some special roaming packages. There are no dedicated GCC-only specials according to any of the operators, however, there are bilateral agreements that span across a number of GCC member states for some roaming services. Two of the three operators offer flat-rate roaming packages. Retail caps on outgoing calls (calls made back home and calls made within the visited country) as required by the GCC roaming Regulation (see Section 8.1) have been implemented by all operators as reflected on their websites and confirmed by the GCC operators surveyed.

103. Roaming is a default service with opt-out options for customers of two of the three operators, and an opt-in service for customers of one of the operators. While two operators stated that they took competing roaming offers into consideration when designing their own roaming offers, one operator stated that they were aware of them, but did not take them into account.

104. All operators stated that they did not monitor this closely (i.e. closely the impact of indirect roaming substitutes such as purchase of a local SIM card upon arrival in the visited market (i.e. no impact assessment on roaming traffic). One operator also mentioned that it was aware of another alternative to roaming offered to inbound roamers in the form of prepaid local roaming numbers, however no example was provided. All three operators confirmed that there were no “roaming-only” providers in the GCC region, but one operator stated that there was some limited use of dual IMSI with new entrants.

4.5.1.2 Wholesale roaming activities in Bahrain

105. All three Bahraini operators appear to have relationships with most if not all of the other GCC operators. The nature of the relationship is bilateral. No significant impediments were identified by any of the operators at the wholesale level; however, the amount of traffic that an operator can send determines the degree of bargaining power over IOTs.

106. Bahraini operators point to the fact that Bahrain is a net importer of roaming traffic, as the number of inbound roamers is significantly higher than the number of out bound roamers. Some have raised concerns that, due to their small size, they are at a disadvantage in negotiating wholesale roaming arrangements.

4.5.2 Kuwait

4.5.2.1 Retail roaming activities in Kuwait

107. Customers in Kuwait can take up roaming services with the three Kuwaiti operators Viva Kuwait, Ooredoo Kuwait, and Zain Kuwait. Customers have a choice between standard roaming tariffs and different special roaming packages. While one operator stated that roaming was an opt-in service without making a distinction between post-paid and pre-paid customers, one operator confirmed that roaming was an opt-in service for post-paid and a default service for pre-paid customers. Based on information received from two operators in their responses to the qualitative questionnaires and based on information provided on the operators' websites, two of the three operators appear to offer the full range of roaming services, including GCC specials and data packages. One operator indicated that it did not offer any GCC specials. One operator stated that only 5%-15% of their roaming subscribers use special roaming packages, depending on the season. Operators confirmed that the GCC roaming caps (see Section 8.1) have been implemented at the retail level.

108. Two operators responded that they were aware of the roaming offers of their competitors and confirmed that they took these offers into account when designing their own offers. In terms of indirect substitutes, two operators confirmed that they were particularly aware of OTT applications being used. Moreover, one operator stated that alternative solutions such as Dual IMSI and MVNOs offering local IMSI are in use without substantiating it further.

109. The use of the international gateway (see Section 4.5.2.2) imposes high costs for international calls on Kuwaiti MNOs. These costs impact the price of corresponding retail plans.

4.5.2.2 Wholesale roaming activities in Kuwait

110. Based on responses received from Kuwaiti operators, there is no substantial difference between the models used for negotiating IOTs with GCC operators and those used for operators from the rest of the world. All types of IOTs seem to be common: balanced/unbalanced models as well as various discounts. Regarding the length of contract, the duration of a standard contract varies between 1 and 3 years and is renewed automatically. The settlement depends on the negotiating parties. Moreover, a number of factors impacting IOT negotiations are described by Kuwaiti operators, including e.g. groups, traffic volumes and the nature of the country.

111. Regarding IOT payments to the visited network, Kuwaiti operators report different practices. While one operator pays IOTs to the visited networks for all roaming services offered, another operator indicated that for voice and SMS, there were no wholesale charges applicable for terminated services, while for data, IOTs are charged in both directions (including receiving MMS).

112. One Kuwaiti operator stated that it was part of a roaming alliance and one stated that it made use of roaming hubs (but only outside the GCC).

113. None of the Kuwaiti operators provides mobile roaming wholesale access (i.e. to MVNOs). In terms of barriers to entry, all operators confirmed that there were barriers to entry, but remained vague on the details of these barriers (except for citing "costs").

114. Lastly, operators raised concerns regarding the circumstances in Kuwait with regard to international transit/GRX/IPX, which are very country-specific. For data roaming (GRX), operators have a choice of providers. For voice, however, the only option is the international gateway operated by the Ministry of Communications (MOC). The rates requested by the MOC are high – in the consultation, some MNOs reported that they receive no MTR revenues, but are required to

pay some 0.35 USD per minute of use. Additional barriers are mentioned with regard to high recurring rates charged by the MOC for number ranges and for spectrum.

4.5.3 Oman

4.5.3.1 Retail roaming activities in Oman

115. Oman has two MNOs (Nawras and Omantel) and three MVNOs (Samatel, Friendi and Renna). Customers have the choice between standard prices, GCC specials, and flat rates / travel packages. All operators, including the MVNOs, have implemented the regulated retail caps (see Section 8.1) as per their websites.

116. All operators have confirmed that they were generally aware of competing offers and that they take them into consideration when designing own offers. Moreover, roaming services have to be purchased separately as an “opt-in” service for postpaid customers, but are default services for pre-paid customers. One operator confirmed that roaming is not taken into consideration by customers at the time of purchase of the domestic mobile package.

117. As regards alternative solutions, such as local SIM cards, one operator stated that it was aware that customers travel frequently to bordering countries such as the UAE and Saudi Arabia and that these customers prefer to purchase local SIM cards upon arrival in those countries. No detailed statistics were provided. Moreover, all operators confirmed that they were also aware of indirect substitutes and confirmed that *WhatsApp* was a frequently used OTT application domestically, as well as when travelling abroad. As regards any alternative roaming solutions to roaming such as dual IMSI or MVNOs offering local IMSI, none of the operators was aware of any such solution, nor had they heard of roaming-only providers in the region.

118. MVNOs raised as a competition issue that due to the roaming retail regulatory price caps, they can only achieve negative margins and have to cover costs such as recharge commission costs and royalty payments from other products and services, given that they purchase wholesale inputs from the MNOs on a commercial basis at only a tiny discount from the MNOs’ own prepaid roaming retail prices.

4.5.3.2 Wholesale roaming activities in Oman

119. Both operators follow standard GCC practice, negotiating IOTs on bilateral basis. One operator confirmed that GCC operators’ negotiation is treated differently to negotiation with the rest of the world, as there needs to be a synergy in the region. Moreover, it was indicated that there is a preference to avoid the balanced / unbalanced method of negotiation. Discounts are applied to IOTs. Duration for agreements is normally 1 year with annual settlement, but this can vary, depending on the negotiating operator. Both operators pay IOTs for all roaming services. There are exceptions with regards to SMS termination and in some cases mobile terminated calls. None of the operators is part of any alliance, nor do they make use of roaming hubs.

120. Both operators confirmed that there were no barriers to entry at the wholesale level, however, one operator stated that it did not have a choice of international voice transit/GRX/IPX and signalling carriers.

121. Both operators provide wholesale roaming access to MVNOs on a commercial basis; however, the current wholesale conditions are alleged to allow MVNOs very limited flexibility with regard to their own retail prices. One of the MVNOs reports that a large MNO provides them a discount of only 2% from their own retail prices.

4.5.4 Qatar

4.5.4.1 Retail roaming activities in Qatar

122. Qatar has two MNOs, Vodafone Qatar and Ooredoo Qatar, that offer IMR services to their customers. Both operators offer standard roaming prices to pre-paid and post-paid customers that adhere to the retail price caps for voice (see Section 8.1).

123. In addition to the standard prices, both operators stated that they offer flat rate roaming packages and special GCC rates. Our understanding is that these are primarily in terms of better prices for IMR data in specific GCC countries or zones.[26]

124. Both operators stated that roaming is a default service for prices with opt-out options. Special packages are also available and have to be purchased separately.

125. Both operators stated that they were fully aware of what their competitors offered in the market, and both stated that they continuously monitored competing market offerings.

126. In relation to indirect roaming substitutes, both operators stated that they were aware that customers held multiple SIM cards from different operators for roaming purposes and especially frequent travellers to same destinations. Neither of the operators themselves offers indirect roaming substitutes. Both operators confirmed that they were also aware of the usage of OTT services such Whatsapp, Imessage, and Facetime as an imperfect substitute for other IMR services such as SMS; however, they were not aware of the existence of any alternative roaming solutions in the GCC such as dual IMSI or MVNOs offering local IMSI. Moreover, neither had heard of any roaming-only providers.

4.5.4.2 Wholesale roaming activities in Qatar

127. Both operators confirmed that they apply discount IOT regimes and that, generally, the following regimes are applied in the GCC:

- fixed discounted rates for voice, SMS and data
- fixed payment commitment (pay fixed amount for a certain threshold of traffic)
- balance/unbalanced IOT discount.

128. The standard contract period is one year; however, settlement and discount regimes differ depending on the negotiating parties and therefore there is no uniform way of negotiation. Both operators confirmed that there is a difference in negotiation between GCC operators and the rest of the world due to closer GCC ties and because most traffic that is inbound is from other GCC member states. Both operators make use of roaming hubs, but none is part of any multi-country alliance. Neither operator provides wholesale access (e.g. to MVNOs), given that there is no demand for it in the market.

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26 For Vodafone, see http://www.vodafone.qa/files/dmfile/140401_PostpaidTariffFinal.pdf; for Ooredoo, see http://www.ooredoo.qa/idc/groups/public/documents/document/c10-01_postpaid_mobile_april.pdf?CSRT=2197709876152642800.

4.5.5 Saudi Arabia

4.5.5.1 Retail roaming activities in Saudi Arabia

129. Saudi has three mobile operators – STC, Mobily and Zain Saudi - that offer the full range of IMR services to their customers. These roaming services span the whole spectrum of service types, including standard post-paid and pre-paid services, GCC specials and various flat rates and bundles. One large Saudi operator stated that almost 30% of its subscribers choose data bundles.

130. Two operators began to implement the GCC retail price caps in February 2012, while one of the mobile operators delayed the implementation of the retail caps until September 2012.

131. The mobile network operators in the Saudi stated that they were fully aware of what their competitors offered in the market, and that they continuously monitored competing market offerings.

132. Regarding roaming substitutes, one Saudi operator estimates that about 30% of its outbound roamers use multiple SIM cards from different operators for roaming. The Saudi MNOs are well aware of indirect roaming substitutes such as plastic roaming, Wi-Fi Offload, and OTT applications.

4.5.5.2 Wholesale roaming activities in Saudi Arabia

133. Saudi operators use different models for negotiating IOTs. They negotiate both on a bilateral basis or as part of a group depending on the specific deal. One operator stated that most of their IOT agreements are based on flat rate IOT, and that they do not prefer so-called balanced/unbalanced IOT models. The operators also apply discounts on IOTs. The standard duration of an IOT agreement is one year.

134. The Saudi operators that responded to the qualitative questionnaire pay IOTs to the visited network for all their roaming services offered. The IOT rates are in line with the caps set.

135. The Saudi operators regard the 15% royalty and the 1% license fee (a total of 16%) from the total net revenue as an impediment to their profitability and global competitiveness.

4.5.6 UAE

4.5.6.1 Retail roaming activities in the UAE

136. The Emirati retail market for IMR has two operators, Etisalat and Du, which offer different types of IMR services, including flat rate/ travel passes and prices. Etisalat reportedly offers special flat rates, and also has special rates for Mobily customers. Both operators take account of one another's offers. Both operators have implemented the regulatory retail caps on outgoing calls.

137. Both operators stated that they were generally aware of the types of roaming packages that their competitor offered and that they took them into consideration when designing their own offers. One operator stated that roaming services are a default service for pre-paid customers, and for post-paid customers the service is default for calls and SMS received only. The other roaming services are opt-in. The other operator confirmed that it only provided roaming as an opt-in service. Both operators stated that they were aware that customers held different SIM cards from multiple operators for the purpose of roaming, and one indicated that about 18% of its customers held different SIM cards. They also stated that they were aware of indirect roaming substitutes such as

OTT applications. Moreover, one operator confirmed that it offered a dual IMSI service for the same MDISDN (mobile number).

4.5.6.2 Wholesale activities in the UAE

138. Both operators negotiate IOTs on a bilateral basis and apply discounts to the IOTs. They do not apply different IOT regimes for GCC and non-GCC operators. While none of the operators encourages balanced/unbalanced negotiation, they enter into such negotiations if necessary. The standard duration / period for an IOT agreement ranges from one to three years. Neither of the operators is part of any multi-country roaming alliance, nor do they make use of roaming hubs. No roaming wholesale access is provided. Both operators have a choice of international transit providers.

5 The cost of international mobile roaming services in the GCC

139. An understanding of the underlying costs (both at wholesale and at retail level) of providing IMR services is essential to assessing what potential options for policy intervention, if any, warrant serious consideration.

140. Wherever possible, the RWG used information provided by GCC network operators in response to the questionnaire; however, in many cases, the questionnaire responses are not altogether definitive. Furthermore, the RWG is limited in what it can say due to the need to protect confidential data provided by the GCC network operators. The RWG has therefore cross checked and filled in gaps where appropriate using information obtained in previous studies in Australia and New Zealand as well as in Europe.

141. The remainder of this chapter covers costs in the Home Network (Section 5.1) and in the Visited Network (Section 5.2).

142. Taxation is an issue that impacts both Home Network and Visited Network costs. MNOs in the GCC are subject to a range of taxes, some based on gross revenues, some based on net revenues (i.e. profits), plus a number of special tax-like fees (e.g. annual licence fees, ICT Fund payments). Taxes are a significant cost, but highly variable across the GCC member states. The RWG has chosen to reflect taxes on profits not as costs, but rather as an adjustment to the appropriate level of profitability that the MNO and its investors can expect to earn (expressed as a *pre-tax Weighted Average Cost of Capital (WACC)*). Based on regulatory proceedings in the region, the RWG assumes the appropriate pre-tax WACC for MNOs in higher tax countries in the GCC region to be 13%.[27]

143. Not all taxes are on profits. Where tax is applied to total gross revenues, for instance, a portion can be assumed to be a tax on profits, and the remainder a tax on revenue used to recover costs. The RWG has chosen to treat all taxes (and other involuntary levies) that are not based on the level of profit as costs, and to group them together with roaming overhead costs.

144. Our task in this chapter is to explain how roaming has operated to date in the GCC on average; consequently, the cost estimates used in this chapter reflect *actual average* IOT payments and retail revenues for the GCC region, and *average* tax rates for the GCC region as a whole. Where we compute wholesale and retail price caps for calls made, calls received, SMS, and roaming data in Sections 9.7, 9.8, 9.9, and 9.10, respectively, our task is instead to ensure that the price cap exceeds the *maximum* price for any GCC member state. In consequence, small differences can be expected between the estimates in this chapter and those in Chapter 9.

5.1 Home Network

145. The Home Network provides IMR retail services to end users.

146. Relevant cost components for home network IMR services include:

    a. retail costs;

    b. wholesale payments to the visited network;

    c. roaming overhead costs (as defined below, plus taxes and other involuntary payments to the government); and

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27 See for instance UAE TRA (2012), "Etisalat's Regulated Weighted Average Cost of Capital", Determination no. (2) 2012, 1 July 2012.

d. signalling.

147. For some IMR services, home network costs can also include:

a. origination, termination, and other traffic related costs; and

b. international transit.[28]

148. Each of these cost components is reviewed in this section.

149. For all retail services, there are *retail costs* associated with for instance customer acquisition and customer care. It is generally impractical to differentially allocate these retail costs to individual services; consequently, they are generally assumed to represent either a constant percentage of retail revenue for all services, or else as a constant percentage of the cost of generating that retail revenue (as the RWG has done in this report).[29] Retail costs are a common cost for the MNO's entire business, not a cost specifically attributable to IMR.

150. The assumption that IMR retail costs represent 20% of the cost of generating the associated IMR service is broadly consistent with international best practice.[30]

151. For most IMR services,[31] the Home Network makes a wholesale payment to the Visited Network. This payment is referred to as an *Inter-Operator Tariff (IOT)*.[32] These IOT payments may be substantially in excess of underlying costs; to the Home Network, however, the IOT paid is the true cost – the underlying cost elements are irrelevant to the Home Network, except perhaps where the Home Network and the Visited Network are under common management and/or ownership. Among GCC region MNOs that are affiliated with one another (e.g. in the same group), and who face their true costs rather than a possibly inflated IOT, costs are likely to be less.

152. Roaming overhead costs are various costs entailed in maintaining the roaming service. Roaming overhead costs consist of a variety of administrative and network-related components.

153. Roaming overhead costs are comprised of negotiation of agreements, testing (IREG, TADIG), operations and maintenance (including accounting, payments, revenue assurance, fraud prevention, dedicated staff costs, software and systems for roaming operations), data clearing, financial clearing, and hubbing.

154. In the survey that the RWG conducted in preparation for this report, most GCC MNOs were unable to estimate the magnitude of roaming overhead costs. Several GCC network operators reported

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28 Some MNOs pay third parties for transit; others may have dedicated facilities. In either case, they incur costs for transit.

29 The retail overhead is not itself included among these costs.

30 See for instance the discussion of retail costs in Section 3.6 of Imme Philbeck, J. Scott Marcus, Jasper Mikkelsen, and Werner Neu (2012), Trans-Tasman Roaming: Service Costs. Attempts to quantify retail costs have sometimes expressed costs as a fixed number, sometimes as a fraction of retail revenue, and sometimes as a percentage of the cost of providing the retail service. Treating the estimate of the retail cost of IMR as a percentage of the total cost of providing the retail service avoids the need for circular reasoning as to the likely profitability of the IMR service.

31 For calls received while roaming, in most parts of the world there is no wholesale payment specific to roaming (the home network will simply pay the standard mobile termination rate to the visited network; typically this will be paid by the home network's interconnection team and as such may not be visible to the home network's roaming team). The GCC is unusual in that there can sometimes be roaming-specific wholesale charges for IMR calls received. For SMS received while roaming, in most parts of the world there is no wholesale payment specific to roaming, or indeed any standard termination rate payment (as 'bill and keep' is applied).

32 This is a shorthand way of referring to a set of payment arrangements that can in practice be quite complicated.

total roaming overhead costs as being in the neighbourhood of 1.0 million to 1.5 million USD per annum for all roaming services worldwide (not just in the GCC).[33]

155. Given that these network operators are of different sizes, these constant fixed costs to offer the roaming service imply a wide spread when they are translated into unit costs; nonetheless, they represent only a small fraction of the total cost of providing each IMR service. For each service, the RWG has provided specific allocations, generally following a previous analysis conducted for the Australia and New Zealand governments.[34]

156. As previously noted, we have found it convenient to aggregate these roaming overhead costs with taxes that are not based on profits.[35]

157. The cost of signalling is in principle relevant to all roaming services in both home and visited networks; however, this cost is small. GCC network operators provided very little information on these costs. It can be observed that in the Trans-Tasman roaming exercise, signalling costs were found to be well under 0.01 USD per roaming voice call minute, per SMS, and per data MB. Therefore, the role that signalling costs play for purposes of the current analysis is minimal. In general, we have grouped signalling costs together with other roaming overhead costs.

158. One of the GCC network operator responses to the survey questionnaire demonstrates that for voice calls made, SMS sent, and data, retail costs together with the wholesale payment to the visited network constitute some 97% of the total cost to the home network of providing the service. Thus, roaming overhead constitutes only 3% of the total. This is plausible in light of analysis conducted in other countries.[36]

159. Home network costs can vary depending on the specific IMR service offered. This is especially true for origination, termination, and other traffic related costs, and for international transit costs. Home network costs are discussed in more detail for each of the IMR services in the sections that follow.

5.1.1 Home network calls originated

160. The primary costs that are relevant to the home network for voice calls made are:

    a. retail costs;

    b. wholesale payments to the visited network; and

    c. roaming overhead costs, taxes, and any other costs.

161. Retail costs are allocated as a percentage of the total cost to provide the associated retail service, as explained earlier in this section. For calls made to GCC member states other than the visited country, the RWG estimates retail costs of 0.10 USD per minute.

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33 In the public consultation, one MNO increased its estimate by a factor of four. It did not substantiate the claim, and the relevant question here in any case are the costs for an efficient operator.

34 See Imme Philbeck, J. Scott Marcus, Jasper Mikkelsen, and Werner Neu (2012), Trans-Tasman Roaming: Service Costs.

35 For our purposes, annual licence fees and ICT Fund payments also constitute taxes.

36 See, for example, Imme Philbeck, J. Scott Marcus, Jasper Mikkelsen, and Werner Neu (2012), Trans-Tasman Roaming: Service Costs.

162. Based on the results of the survey of MNOs, the average wholesale payment made to the visited network for calls home is just under 0.48 USD per minute for 2012.[37] The RWG uses this as an estimate of the IOT paid for calls to all GCC countries other than the visited country.[38]

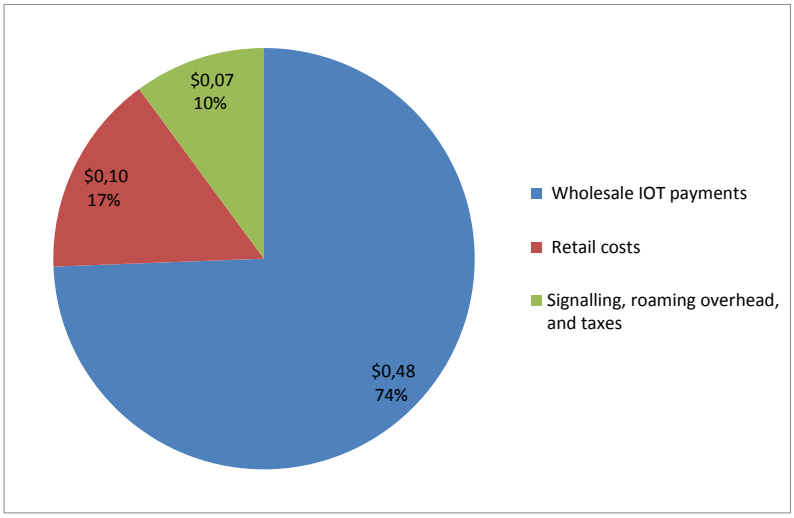
163. As previously noted, it is challenging to allocate roaming overhead costs based on the information received. A previous result for Australia and New Zealand found those costs to be 0.009 USD, i.e. just under one US cent.[39] Rounding, we treat these costs as being 0.01 USD.

164. The rule of thumb noted earlier that retail costs plus wholesale IOT payments represent 97% of home network costs for IMR voice calls made, SMS and data implies that other costs, including roaming overhead costs, are 0.019 USD. Rounding, we have assumed that 0.02 USD is the correct figure for all other costs (including the previously noted roaming overhead costs of 0.009 USD).

165. Lumping in taxes, the combined cost of signalling, roaming overhead, and taxes and similar involuntary payments to the government is some 0.07 USD.

166. The total cost per minute to the Home Network of roaming calls made to GCC member states other than the visited member state is thus some 0.65 USD.

Figure 30 - The cost of calls made to GCC member states other than the visited country (in USD)



167. For roaming calls made within the visited country, total revenues per minute are 0.25 USD (i.e. below the cap of 0.28 USD). Wholesale payments made to the visited network are 0.21 USD. Retail costs are 0.05 USD. Roaming overhead costs plus taxes are 0.04 USD.

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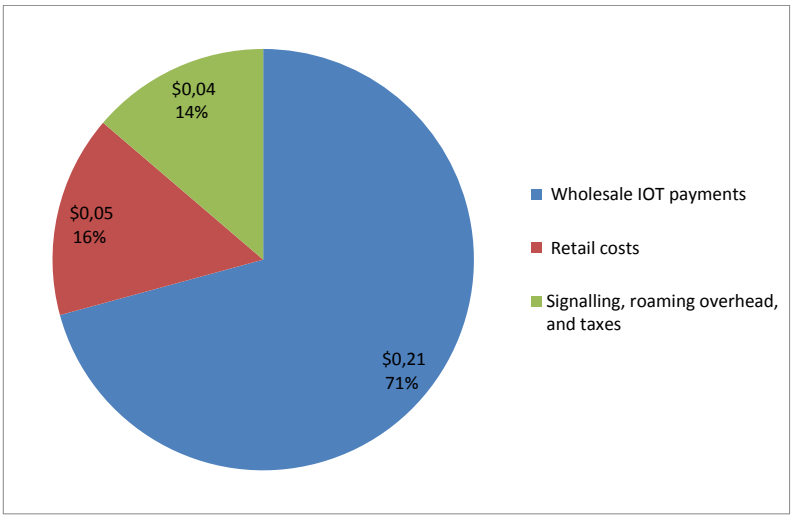
37 This is consistent with a cap of 0.50 USD.

38 In estimating revenues and IOTs, most GCC MNOs were unable to distinguish between calls to other GCC countries and calls to third countries outside the GCC. In order to avoid bias, the estimate of calls to GCC countries other than the visited country is therefore based solely on survey results for IOTs charged for calls home. Note that we have used different estimates for different purposes in this report.

39 Imme Philbeck, J. Scott Marcus, Jasper Mikkelsen, and Werner Neu (2012), Trans-Tasman Roaming: Service Costs.

Figure 31 - The cost of calls made to the GCC within the visited country (in USD)



5.1.2 Home network calls received

168. For the home network, a call received on behalf of a roamer entails (1) accepting the call, and (2) forwarding it to the visited network. This can be thought of as terminating and re-originating the call; however, the costs are substantially different from those of a domestic call. Notably, the home network's termination does not involve any of its own radio access network resources.

169. The home network receives a termination fee from the domestic or foreign network from which the call originates (or receives retail revenue if the call to the roamer happened to originate on-net). If the call was originated with the home country, this termination fee will reflect the domestic mobile termination rate (MTR).

170. The home network is also obliged to pay an international termination fee to the visited network. The MTRs used for these payments will typically not be the same. The difference between the MTR fee received and that paid represents a net cost (or possibly a profit) for the home network.

171. Operator responses to the questionnaire showed considerable variation, but suggest an average *Mobile Termination Rate (MTR)* paid to visited networks (net of any transit charges that might be relevant) of some 0.08 USD. International MTRs among GCC MNOs cannot exceed 0.10 USD. The MTR received in this case may be domestic, but the MTR paid is always international, and thus often 0.10 USD. For purposes of costing, we have made the conservative assumption that the average difference between the MTR received and the MTR paid among pairs of MNOs is 0.06 USD, which would be in the right range if HN receives a domestic MTR of some 0.04 USD. If the HN receives an international MTR, the two payments should instead be roughly in balance (0.10 USD each), in which case the Home Network would incur no net cost.

172. Kuwait is an exception to these termination costs due to arrangements with the international gateway. MNOs generally pay 0.35 USD for international termination, and receive no revenue at all for incoming international termination. For Kuwait, the difference between the MTR received and the MTR paid among pairs of MNOs can thus be assumed to be 0.35 USD, which is roughly 0.27 USD more than in other GCC member states; however, the payment to the international gateway includes transit, so the net increase is 0.24 USD.

173. Taxes imposed on Kuwaiti MNOs are minimal.

174. In Kuwait, Visited Networks sometimes collect an additional wholesale payment of not more than 0.04 USD for completing the call to the roamer. To the Home Network, this represents an additional cost.

175. The home network also incurs the transit costs associated with carrying the voice call from the home network to the visited network.[40] Two GCC MNO responses claimed that these costs are in the range of 0.10 USD per voice minute, which seems to us to be implausibly high in comparison with international results. For example:

    a. In 2006, INTUG (a European association of business users) estimated transit for voice in Europe to be just € 0.01, or about 0.013 USD.[41]

    b. Also in 2006, Copenhagen Economics estimated transit for voice in Europe to cost between € 0.01 and € 0.025, taking a generous overall estimate to be about € 0.02 (or 0.025 USD).[42]

    c. In 2011, a European Commission staff working paper used € 0.02 (or about 0.03 USD at then-current exchange rates) as an estimate of the cost of international voice transit in Europe.[43]

    d. In a 2012 study of IMR costs between Australia and New Zealand on behalf of the respective governments, WIK-Consult estimated the cost of voice transit between the two countries to be some 0.03 USD per minute.[44]

176. These international results are all well below the two MNO survey results in question; moreover, it is clear that effective transit unit costs for MNOs that have their own international facilities must be substantially less than unit costs for MNOs that procure transit from third parties, thus lowering the average. The claimed costs of 0.10 USD cannot be reflective of the costs of an efficient network operator. Therefore, for purposes of this analysis, and without prejudice to any other proceeding in the GCC, the RWG assumes international voice transit costs within the GCC to be 0.03 USD per minute.[45]

177. It is reasonable to assume that some additional signalling costs and roaming overhead costs are associated with calls received. The RWG has assumed these costs to be not more than 0.02 USD per minute, which is consistent with the approach taken to the cost of calls made (see Section 5.2.1).

178. Consistent with our approach throughout, we have combined taxes (which can be considerable) with the roaming overhead costs for a combined cost of 0.03 USD per minute.

179. Assuming once again that retail costs represent 20% of the cost of producing the retail service, retail costs in GCC member states other than Kuwait represent 0.02 USD per minute.

180. The combined home network cost, under generous assumptions, thus comes to 0.14 USD per minute for calls received by a roamer from a GCC country other than Kuwait.

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40 Some MNOs pay third parties for transit; others may have dedicated facilities. In either case, they incur costs for transit, but the unit costs in the latter case are probably quite small.

41 INTUG response to the European Commission's Consultation on Roaming Charges (2006), at http://ec.europa.eu/information_society/activities/roaming/docs/phase2/intug.pdf.

42 Copenhagen Economics (2006), Roaming: An Assessment of the Commission Proposal on Roaming.

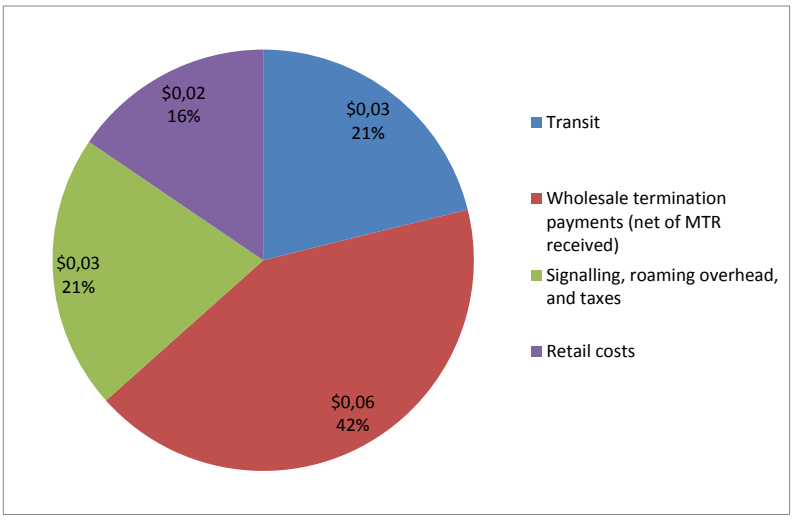
43 European Commission (2011), Staff Working Paper, SEC (2011) 870 final.

44 Imme Philbeck, J. Scott Marcus, Jasper Mikkelsen, and Werner Neu (2012), Trans-Tasman Roaming: Service Costs.

45 In Kuwait, these costs are carried by the international gateway, not by the MNO.

181. Where Kuwait is the home country, the average cost can be assumed to be 0.40 USD; however, in those cases where the Kuwaiti visited network operator receives up to 0.04 USD from the home network operator, the net cost will be correspondingly less.

Figure 32 - Cost to the home network of completing a call from a country other than Kuwait to a roamer in the GCC (USD per minute)



5.1.3 Home network SMS sent

182. For the home network, the key cost is the wholesale payment to the visited network. In addition, there are signalling costs, roaming overhead costs, transit, and retail costs.

183. Based on the results of the survey of MNOs, the average wholesale payment made to the visited network per SMS is computed to be roughly 0.19 USD in 2012.

184. Responses from the GCC region suggest the sum of home network signalling costs, roaming overhead costs and transit costs in the region are similar to those that were found in Australia in 2012 to be some 0.008 USD.[46] Consistent with our approach throughout, we have combined taxes with these costs, yielding a total of 0.03 USD.

185. Retail costs are once again assumed to represent 20% of the cost of producing the retail IMR service (see the beginning of Section 5.1). Retail costs thus represent 0.04 USD per SMS.

186. Combined home network costs per SMS are thus 0.26 USD.

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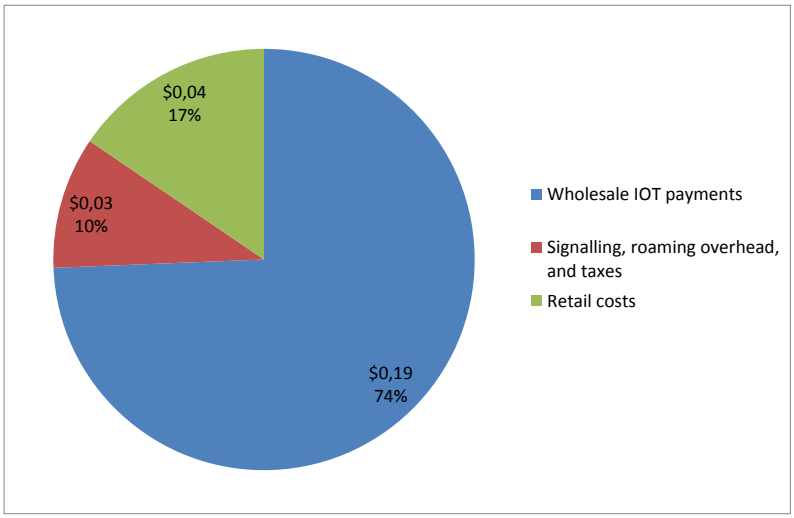
46 Imme Philbeck, J. Scott Marcus, Jasper Mikkelsen, and Werner Neu (2012), Trans-Tasman Roaming: Service Costs.

Figure 33 - Costs to the home network per SMS (USD)



5.1.4 Home network data

187. The primary Home Network costs associated with data roaming are:

    a. the wholesale IOT payment;

    b. international transit and signalling;

    c. roaming overheads (plus taxes); and

    d. retail costs.

188. Based on MNO survey responses and RWG estimates, the GCC average wholesale payment per MB in 2012 was 4.95 USD/MB. The disparity among GCC member states was large.

189. Responses from GCC MNOs provide only a limited basis on which to estimate international transit charges, signalling, or roaming overheads. Based on an assessment in 2012 for the governments of Australia and New Zealand, international transit charges plus signalling can be assumed to be not more than 0.03 USD/MB, while roaming overheads can be assumed to be not more than an additional 0.03 USD/MB. The cost to the home network of data transit provided by an Internet Service Provider (ISP) is negligible.[47]

190. Consistent with our approach throughout, we have combined taxes (which are considerable in some GCC member states) with roaming overhead costs. This yields 0.48 USD per MB.

191. Retail overhead is once again assumed to represent 20% of the cost of providing the retail service. Retail overhead is thus 1.00 USD/MB.

192. The total cost of IMR data to the home network per MB can thus be assumed to be 6.46 USD. It is worth noting that nearly all of this cost is directly or indirectly attributable to a wholesale IOT price that appears to bear no relationship to underlying cost (see Section 5.2.4). Among GCC region MNOs that are affiliated with one another (e.g. in the same group), and who face their true costs rather than a possibly inflated IOT, costs can be assumed to be vastly less.

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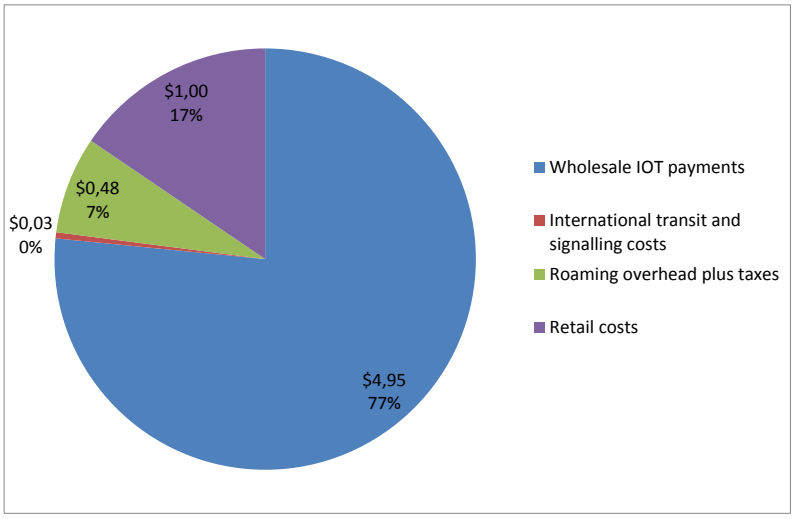
47 Imme Philbeck, J. Scott Marcus, Jasper Mikkelsen, and Werner Neu (2012), Trans-Tasman Roaming: Service Costs.

Figure 34 - Cost of international mobile roaming data to the home network (in USD, 2012)



5.2 Visited network

193. For all IMR services, it is the Visited Network's radio access network that is used; thus, the visited network plays a large role in implementing the desired service, and contributes substantially to the cost.

194. No retail costs are relevant to the visited network.

5.2.1 Visited network calls originated

195. For calls originated, the visited network is performing a function not very different from that of placing a voice call on behalf of a domestic subscriber.

196. It incurs cost over the radio access network associated with the roamer. It typically pays a termination fee (fixed or mobile, as appropriate) to the network that completes the call; however, if the call is on-net, it instead bears its internal costs of termination.

197. Operator responses to the questionnaire showed considerable variation, but suggest the following average Termination Rates (TRs) paid to called networks (net of any transit charges that might be relevant) for calls from GCC member states other than Kuwait:

    a. An off-net MTR of some 0.08 USD, most but not all of which is international.

    b. A Fixed Termination Rate (FTR) of some 0.07 USD.

    c. An on-net termination cost of some 0.04 USD (see below).

    d. Given that relatively few calls terminate on-net, this implies an effective blended overall Termination Rate of not more than 0.08 USD.

    e. For calls to a member state other than the visited member state, we assume that most calls are to the mobile network, and assume that an MTR of 0.10 USD is relevant.

198. Among those few GCC networks that responded, the average cost of call origination was 0.047 USD per minute, while the average cost of on-net termination was 0.033 USD per minute. The cost of voice call origination and termination are often assumed to be similar; consequently the RWG assumes for purpose of this analysis, and without prejudice to any other proceeding in the

GCC region and its member states, that the cost of voice origination and voice termination on an MNO's own network are 0.04 USD per minute (the average of 0.047 USD and 0.033 USD).

199. If the call is placed to a country other than the visited country, the visited network also bears international transit costs. Survey responses from two GCC MNOs place these costs at some 0.10 USD per minute, a figure that seems to us to be exceptionally high in comparison with international results. Consistent with our approach in Section 5.1.1, we assume that the correct cost for voice transit (taking into account that these costs are in addition to assumed international termination costs of 0.10 USD) is not more than 0.03 USD.

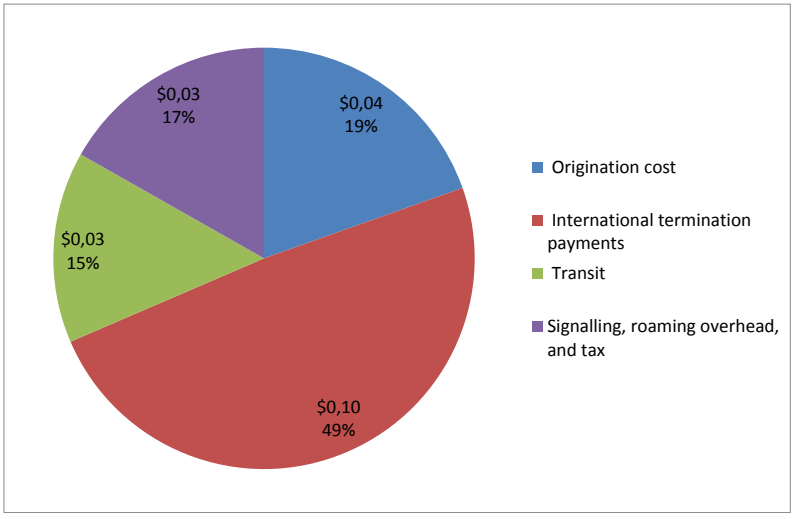
200. The visited network also bears certain roaming overhead and signalling costs. Since these are the same signalling messages that the home network receives, and involve the same billing records, the RWG assumes that these costs are similar to the corresponding home network costs, i.e. 0.02 USD per minute. Adding taxes to this figure yields a combined figure of 0.03 USD.

201. With very generous allowances, this implies a cost to the visited network for off-net calls made within the GCC (but not to the visited country, and not from Kuwait) of 0.20 USD.

202. For roaming calls from Kuwait to another GCC member state, the relevant costs are 0.35 USD for the international gateway, 0.04 USD for call origination, and 0.02 for signalling and roaming overhead, for a combined effective cost of 0.41 USD. Taxes in Kuwait are minimal.

203. Since international transit costs of 0.03 USD would not be relevant to roaming calls made within the visited country (and domestic transit costs can already be assumed to be covered within the origination cost), and domestic rather than international termination is relevant, the cost to the visited network for off-net calls made within the visited GCC member state would be not more than 0.13 USD. This is also true when roamers in Kuwait place calls to Kuwaiti destinations, since these calls do not pass through the international gateway.

Figure 35 - Cost to the visited network of calls made within the GCC to member states other than the visited country (in USD per minute)



5.2.2 Visited network calls received

204. The cost to the Visited Network of completing (terminating) a call to a roamer is nearly the same as that of terminating a call to a domestic customer.

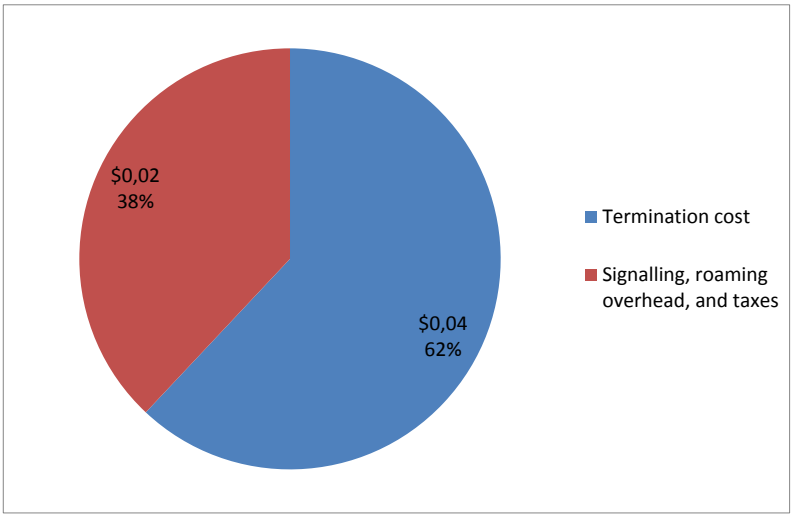
205. As explained in Section 5.2.1, the RWG assumes for purpose of this analysis, and without prejudice to any other proceeding in the GCC region and in its member states, that the cost of voice origination and voice termination on an MNO's own network are 0.04 USD per minute.

206. The Visited Network receives a normal payment of its mobile termination rate from the home network. In most of the world, the Visited Network receives no other revenue for completing the call.[48]

207. It is reasonable to assume that some additional signalling costs and roaming overhead costs are associated with calls received. Consistent with the assumptions that the RWG has made for calls made (see Section 5.2.1), the RWG assumes that these costs cannot be more than 0.02 USD per minute. Adding tax, we still have a combined cost of 0.02 USD.

208. This implies a cost to the visited network for calls received of 0.06 USD.

Figure 36 - Cost to the visited network of calls received (in USD per minute)



5.2.3 Visited network SMS sent

209. When an SMS is sent by a roamer, the visited network transmits the SMS to the home network over the signalling channel. The SMS is then sent by the home network. Given the small size of an SMS message, the actual transmission costs and the costs over the radio access network are negligible.

210. The costs include origination costs, signalling costs, international transit, and roaming overheads.

211. GCC operator responses provide limited details on these costs, but suggest that these costs for the region are quite low, and that each is at a similar level to that which was computed in a study of costs for Australia and New Zealand in 2012.[49] The combined cost in that assessment was found to be in the range of 0.008 USD per SMS, which seem to be in the right range for the GCC as well. Note that this is less than 0.01 USD (one cent). This represents the total cost the visited network of sending a roaming SMS.

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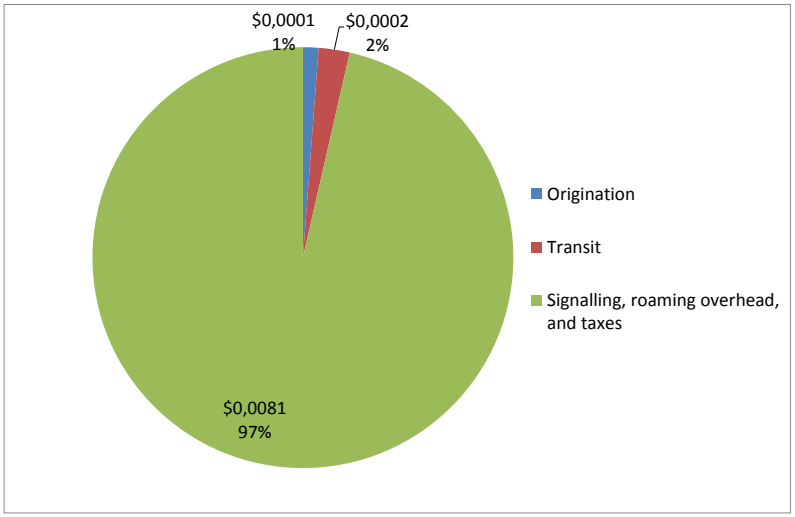
48 In Kuwait, the visited MNO receives no MTR for an international call, but may receive a wholesale (IOT) roaming payment.

49 Imme Philbeck, J. Scott Marcus, Jasper Mikkelsen, and Werner Neu (2012), Trans-Tasman Roaming: Service Costs.

Figure 37 - Cost to the visited network of each SMS made (in USD per minute)



5.2.4 Visited network data

212. Data is routinely transmitted from the visited network to the home network by means of a *GRX* or *IPX*[50] (an IP packet exchange facility for mobile network operators). It is the home network operator that then bears the cost of sending the data, typically over the public Internet. The reason for this seemingly unproductive data transmission is that it enables the home network to unambiguously know the volume of data transmitted (or received) and to bill for it.

213. Once LTE is used for mobile roaming services, an LTE local breakout facility (see Section 10.4) could provide a more efficient way to route roaming data. LTE is deploying rapidly in the GCC region, and the use of LTE roaming is growing in the GCC; thus, reductions in the cost of roaming data could be expected in the future.

214. Relevant costs thus include:

    a. the radio access network costs associated with the data;

    b. the costs of transmitting the data from visited network to home network; and

    c. a range of signalling costs and roaming overhead costs, plus taxes.

215. GCC network operator responses suggest that the cost per MB over the radio air network (RAN) cannot be greater than 0.05 USD. This is plausible when one considers that the cost is unlikely to be greater than the price charged for domestic mobile data services.

216. Based on a result that appears in a study performed for the Australia and New Zealand governments;[51] the cost of international transit and of signalling can be assumed to be in the range of 0.03 USD, and roaming overheads can also be assumed to be in the range of 0.03 USD/MB. Once again, we combine taxes with roaming overheads, for a total of 0.04 USD.

217. This yields a combined cost to the Visited Network, under generous assumptions, of some 0.12 USD.

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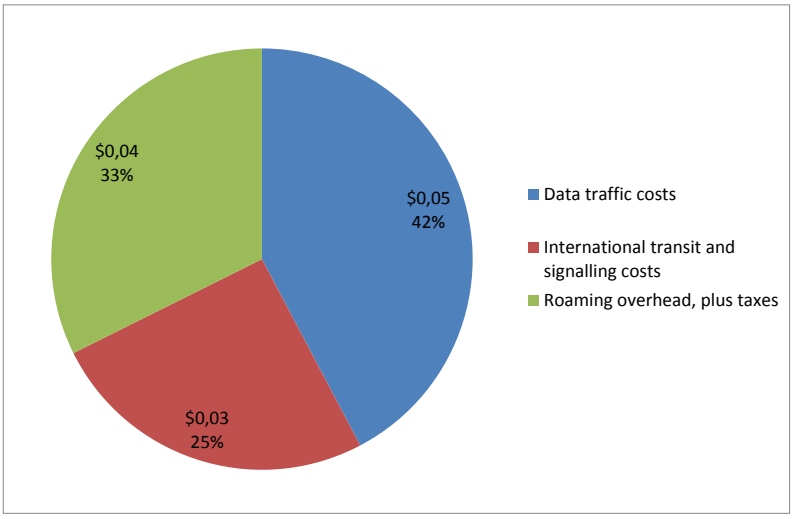
50 GRX is used in the case of 2G, 3G and 3.5G networks, whereas IPX is used in LTE networks.

51 Imme Philbeck, J. Scott Marcus, Jasper Mikkelsen, and Werner Neu (2012), Trans-Tasman Roaming: Service Costs.

Figure 38 - Data roaming cost per MB to the visited network (in USD, 2012)



5.3 Summary of key findings

218. A summary of the key findings of this chapter appears in *Table 3* and *Table 4*.

Table 3 - Home network costs (in USD)

	Per	Wholesale IOT payment to visited network	Transit	Signalling	Roaming overhead plus taxes	Wholesale termination payment (net of MTR received)	Retail costs	Total
Calls made (international GCC)	min	0.48	0.07			n/a	0.10	**0.65**
Calls made (visited country)	min	0.21	0.04			n/a	0.05	**0.30**
Calls received (other than Kuwait)	min	Not applicable	0.03	0.03		0.06	0.02	**0.14**
Calls received (Kuwait)	min	Not applicable	0.02			0.31	0.07	**0.40**
SMS sent	SMS	0.19	0.03			n/a	0.04	**0.26**
Data	MB	4.95	0.03		0.48	n/a	1.00	**6.46**

Table 4 - Visited network costs (in USD)

	Per	Origination or termination	Transit	Signalling	Roaming overhead plus taxes	Wholesale termination payment	Total
Calls made (international GCC)	min	0.04	0.03	0.03		0.10	**0.20**
Calls made (international from Kuwait)	min	0.04	0.00	0.02		0.35	**0.41**
Calls made (visited country, off-net)	min	0.04	n/a	0.03		0.06	**0.13**
Calls received	min	0.04	n/a	0.02		n/a	**0.06**
SMS sent	SMS	0.0001	0.0002	0.008		n/a	**0.01**
Data	MB	0.05	0.03		0.05	n/a	**0.12**

6 Responses to the public consultation

219. This chapter reviews the extensive responses that stakeholders provided to the Consultation Document on IMR across the GCC Region that was published on 4 September 2014.

220. The GCC RWG would like to express its appreciation to those who responded. The many helpful comments provided many useful facts, and have enabled us to refine and improve our approach considerably.

6.1 Respondents

221. Stakeholders were asked to submit their comments in response to the Consultation Document not later than 6 November 2014. This deadline was subsequently extended to 5 December 2014.

222. Seventeen stakeholders, including thirteen of the fifteen MNOs in the GCC region, availed themselves of the opportunity to provide their opinions on IMR across the GCC region (see *Table 5*).

Table 5 – Overview of respondents

Home Country	
MNOs	
Bahrain	Batelco Bahrain
	Zain Bahrain
	Viva Bahrain
Kuwait	Viva Kuwait
	Ooredoo Kuwait (former Wataniya Kuwait)
Oman	Ooredoo Oman (former Nawras)
	Omantel
Qatar	Ooredoo Qatar (former QTel)
	Vodafone Qatar
United Arab Emirates (UAE)	Etisalat
	Du
Saudi Arabia	STC
	Mobily
Others	
	SAMENA
	GSMA
Oman	Mustafa Al Qubtan
Oman	Friendi

223. From the 15 GCC MNOs, most (13 in total, i.e. over 85%) responded to the consultation. The only GCC operators that did not send any comment were Zain Kuwait and Zain Saudi Arabia. This broad feedback enables a thorough review of the consultation document.

224. In addition to this, responses from two associations, one MVNO and one individual were received.

6.2 General comments

225. Numerous stakeholders argued that it was necessary to conduct a comprehensive Regulatory Impact Assessment of the current roaming regulation before taking further steps. Some claim that the Consultation Document does not analyse these effects in an appropriate way.

RWG response: Chapter 9 of the Consultation Document (and Chapter 8 of this document) already provided an assessment of the effects of the regulation, to the extent that it is possible to do so using data that is available today. Section 9.2 of the Consultation Document summarised the measurable effects; section 9.3 evaluated the price elasticity of demand for calls made (which is the only own-price elasticity relevant to the *current* Regulation, since calls received, SMS and data are not regulated); and Section 9.4 assessed the welfare effects that eventuated.

We acknowledge the wisdom of conducting a full and comprehensive assessment of the impacts of the previous regulation, but it is not possible to conduct as full an assessment as we would wish today. For a comprehensive assessment, it would have been necessary to begin collecting data before the regulation came into effect, which was not done.

Very few of the MNOs were able to provide pre-2012 data in response to our questionnaire, so it is not possible to fully reconstruct the pre-Regulation status after the fact.

Our approach instead is to ensure that good analysis of impacts is possible going forward. It is for this reason that we have placed a strong emphasis on gathering good statistics going forward (see Section 10.1).

226. One stakeholder expressed concerns about confidentiality of data, especially in member states where only two MNOs are active (arguing that the other MNO could estimate their data).

RWG response: We believe that our use of the "visited network" approach (see Section 4.1), where data are combined from all responding MNOs in the region, mitigates this concern.

227. A number of stakeholders identified possible inconsistencies in estimates of wholesale costs and retail revenues in the Consultation Document. Two stakeholders identified possible errors in our

calculation of the unit price for outgoing voice in Table 1 "Key characteristics of IMR in the GCC region".

RWG response: The Consultation Document already explained (for instance in paragraph 23) that it was necessary to make estimates to compensate for gaps and inconsistencies in the data provided by MNOs, and that in some cases it had not been possible to use fully consistent approaches to these estimates. We have attempted to be clearer about this in the current text.

228. A few stakeholders considered the analysis to be lacking in transparency.

RWG response: The RWG has striven to be as transparent as possible within the bounds effectively imposed by the need to preserve the confidentiality of sensitive MNO data. The RWG has also attempted to ensure that all of its views and direction are made as clear as possible, both in the Consultation Document and in this Final Report. Wherever the responses to the consultation suggested that something was unclear, the RWG has attempted to address the concern.

229. One stakeholder emphasised the importance of seasonal effects on IMR data, including in making estimates to compensate for missing or implausible data.

RWG response: We have taken seasonal effects into account throughout. Most analysis is on an annual basis. Growth rates are estimated using the same quarter in successive years.

230. Numerous stakeholders felt that it was necessary to pay more attention to potential substitutes for IMR services, and especially to the impact of Over the Top (OTT) services on the retail market.

RWG response: The Consultation Document discussed alternatives to IMR services. Consultation responses did not provide any concrete evidence (e.g. surveys or statistics) demonstrating that these alternatives had a material impact on roamers' choices.

6.3 Comments on Roaming Services and Roaming Scenarios in the GCC region

231. One stakeholder observed that calls (e.g. to customer care) using short code (SC) do not necessarily result in *call detail records (CDRs*).

RWG response: Based on its understanding of the comment that has been made, the RWG considers this matter to be a purely operational issue. Any such calls are treated as national calls made while roaming and are therefore subject to the applicable price caps. If the calls in question are not charged for, then the charge clearly does not exceed a price cap.

232. One stakeholder noted that steering may not be effective under LTE roaming, which is starting to become available in the region. "Not all operators are able and capable to steer based on the

various services. It is also a challenge to steer customers running both voice and data services, where the first steering usually happens based on the first LU attempt which is more linked with voice and not data."

RWG response: This is a valuable observation that has been reflected in the text.

6.4 Comments on Characteristics of Roaming Markets in the GCC

233. Many stakeholders noted the importance of analysing pre-2012 data.

RWG response: The RWG agrees with the importance of analysing pre-2012 data, and in fact requested that MNOs make data available from 2010, but very few of the MNOs were able to provide pre-2012 data, and most of the pre-2012 data that was provided had too many gaps and inconsistencies to enable meaningful analysis.

234. Some argued that retail price could be misleading, because rounding up to the next higher minute meant that short calls of one or two minutes are effectively much more expensive than the cap specified in the regulation.

RWG response: The RWG shares this concern. It is for this reason that we considered requiring MNOs to bill voice calls in one second increments after an initial period (see Section 10.2).

235. Some stakeholders argued that it was inappropriate to consider IMR in isolation from other retail offers. In some GCC member states, they argued, the mobile bundle as a whole is available at very attractive rates. Under this view, too much focus on lowering IMR prices effectively imposes the corresponding costs on the substantial majority of the customer base that rarely if ever roams.

RWG response: Competition is more robust in some GCC member states than in others. Some retail offers in some member states are indeed attractive.

Not all retail packages that include roaming necessarily save consumers money. Often, the daily or weekly payments exceed what consumers would otherwise pay while roaming. Consumers may, however, still benefit from improved predictability.

The RWG is of the view that IMR prices in the region, which greatly exceed underlying cost, detract from the macroeconomic efficiency and integration of the GCC region, and this is the more important impact to deal with. As long as regulated IMR prices are in a proper relationship to costs, they will not represent a major distortion.

236. One stakeholder felt that the statement that roaming services "appear very standard" was not adequately substantiated.

RWG response: We agree. We have revised the statement.

237. An MVNO reports that "wholesale rates are offered at only 2% below the host MNO's current retail prices. Accordingly, MVNOs (mobile resellers) in Oman incur a loss in order to comply to the

present retail price controls for GCC rates. Outbound roaming rates on wholesale rates should be regulated on a cost oriented basis leaving some room for the MVNOs to cover recharge distribution/commission costs, other costs and royalty payment. Required cross subsidisation of roaming is unfair, discriminatory against MVNOs, and not sustainable long term."

RWG response: This appears to be a valid concern, inasmuch as it possibly suggests a form of "price squeeze"; however, the RWG considers that terms of access for MVNOs is a national issue that is out of the scope of the current project.

238. One stakeholder argued that the impending introduction of MVNOs into Saudi Arabia was likely to have a significant impact that needs to be analysed.

RWG response: MVNOs might reduce the retail/wholesale spread by increasing competition; however, the largest problems for roaming in the GCC region appear to relate to wholesale pricing rather than the retail/wholesale spread. MVNOs are unlikely to put much downward pressure on wholesale pricing.

6.5 Comments on the Cost of International Mobile Roaming Services in the GCC

239. Most MNOs had discomfort with the cost estimates.

240. Many stakeholders argued that it was inappropriate to use data from other regions of the world to estimate costs across the GCC region. Some mentioned signalling, transit costs, and roaming overhead, and retail costs as examples of instances where the Consultation Document had used international benchmarks.

RWG response: Most of the policy proposals in this report are based on data from the GCC region.

Wherever reliable data from the GCC region was available, it was used. In many cases, the MNOs were unable (or possibly unwilling) to provide the detailed data that was essential to the analysis, or were unable to provide it in the form requested.

Most of the instances where international benchmarks were used were for costs that are likely to be low, and to have only a limited impact on the final conclusions.

For signalling, transit costs, and roaming overhead, the MNOs provided too little specific data to enable appropriate analysis. The RWG was therefore obliged to make assumptions in order to fill the gaps in the data.

241. A number of stakeholders questioned the assumption that retail costs comprise 20% of the corresponding service.

242. Some argued that retail costs should also be considered for wholesale services.

RWG response: Retail costs are normally calculated by allocating a percentage of revenues of a given service, or of the costs incurred to deliver the service, since it is rarely practical for a network operator to specifically allocate retail costs to a specific service. (These costs are typically relevant to the business as a whole, not just to a

specific service.) It is common in regulatory practice to assume that retail costs correspond either to a percentage of the revenues of a given retail service, or to a percentage of the costs (other than retail costs) entailed in providing the retail service. In this report, we have assumed that retail costs correspond to some 20% of the cost of providing the retail service.

Retail costs such as customer acquisition and customer care are relevant to the network that has the retail relationship with the customer, and thus are not relevant to the visited network.

243. A number of stakeholders argued that taxes are highly diverse from one GCC member state to the next, and that the Consultation Document did not take adequate account of taxes.

RWG response: This is a valid concern. Network operators are entitled to earn a reasonable return on their investments, net of relevant taxes. In light of the responses to the Consultation Document, the RWG has reviewed relevant taxes (and other payments with similar effect) for the region. Taxes on profit are reflected in our use of the pre-tax WACC; other taxes (such as taxes on revenues other than profit) are explicitly included in the cost stack (see Chapter 5). We have made changes throughout to take into account the level of taxation, and the variation among GCC member states.

244. In regard to calls received, some Bahrain stakeholders claim that they receive only $0.026 US per minute for a domestic call made to their roaming subscriber, but routinely pay $0.10 US per minute to ensure that the same call is received by that subscriber elsewhere in the GCC.

245. Kuwait MNOs report that they receive no MTR revenue at all for international calls to their subscribers, but must pay some $0.35 US per minute to forward the call to their subscriber when he or she is roaming. These cases imply there could easily be a net loss per minute if retail prices for calls received are set too low. One stakeholder noted that "international gateways are the facilities through which international calls are sent and received. Where international gateways are not liberalised, their costs make up a significant proportion of the total roaming costs. Even with volume growth, there is no bargaining power for operators working across monopolised gateways. This means inter-operator tariffs are likely to continue to be high."

RWG response: These concerns appear to be valid, and we have taken them to heart.

Relative to the current proceeding, we are establishing a glide path where retail caps for calls made and calls received while roaming are high enough to ensure that the retail prices are not forced below the level of cost, including wholesale costs.

The GCC Council is encouraged to carefully evaluate the impact of MTRs between the GCC member states. MTRs are directly relevant to IMR, but are not usually thought of as IMR costs.

Costs associated with the international gateway in Kuwait have been explicitly taken into account in this report. In the case of calls received by Kuwaiti roamers, this has required a separate, higher price cap than for roamers from other GCC member states.

For later years within the glide path, GCC regulatory authorities will continue to monitor developments. Prices should not be allowed to sink to levels below the corresponding wholesale net payments (see Section 9.8).

246. One stakeholder notes that costs for an SMS to a non-GCC destination typically include costs to reach a particular destination via a hub, and possible additional costs if an SMS interworking (SMSIW) agreement is in place. Billing systems are generally able to distinguish between domestic versus international SMS, but are typically unable to distinguish between GCC and non-GCC SMS. There is thus a risk that retail prices could be regulated to levels that are insufficient to cover these costs.

RWG response: This may be a valid concern, but our generous overall approach to the price caps and glide path more than adequately addresses any concerns (see Section 9.6).

247. A number of stakeholders provided useful details. For instance: "Signaling has three or four different models for charging. The MSU charge is the most common charge, of which for example each SMS requires at least 6-8 MSUs. In addition, data traffic does not go thru signalling except for the GPRS location update. Signaling cost is major cost in the roaming business. In addition, the larger the traffic volumes (voice + SMS), the bigger the MSU count and the higher the bills."

248. Another noted that "… LTE roaming has other major implications among which are new IPX provider, signaling, hub fees if peering shall be via a group hub, along with a number of investments in new platforms or upgrades to offer the service. Thus the cost of LTE roaming is higher than GPRS through to 3G."

249. Still another noted that "… signaling in many cases can go thru a hub and not necessary a direct connectivity for voice and SMS. And hence additional costing is added on both the home and visited networks. For data, there is a GRX link, which also goes thru the hub, and then once it reaches the home network, the rest of the data is transferred via the international IP transit links of the home network. The scenario only explains the uplink, but the reverse path is needed to download the data and deliver it back to the roamer that initiated the request."

RWG response: The RWG appreciates these useful clarifications.

250. One stakeholder identified a minor error where we had estimated the profit margin relative to costs rather than relative to revenues. They also noted a typographical error, a "0" that should not have appeared.

RWG response: We have corrected these errors.

251. Nearly all stakeholders disagreed with the estimated cost of SMS. Many argued that not enough weight was given to declines in roaming SMS volumes over time.

RWG response: The RWG understands that SMS is declining in general across the globe; nevertheless, the RWG also understands that SMS is a key component of the base services provided to a mobile user. More and more consumers are using smart phones (where SMS is less relevant), but there are many consumers for whom this is not yet the case. The RWG is therefore of the view that SMS should be addressed together with other IMR services, despite the fact that the volumes are declining.

252. One MNO claimed "… that roaming overhead is a key cost driver for calls placed while roaming in the GCC. In this regard, [we shared] in the process of data collection related to the Consultation a roaming overhead of USD 1.6 million while the updated overhead cost is USD 5.8 million."

253. Another MNO claims that the 1.5 million USD estimated as annual roaming overhead expense is definitely "… not in line with the current costing taking into consideration all the system, roaming overhead, signalling, and supporting systems in addition to the man power required to run and maintain such service from commercial teams, to analytics, to IREG, TADIG, switching, and marketing teams."

RWG response: The MNO's estimate of its costs quadrupled between the time of the survey and the time of the time of the Consultation Document.

In any case, the relevant question here is not whether any MNO might have a higher cost; rather, the relevant question is whether the price caps are less than the cost of a *reasonably efficient operator*.

The RWG believes in any case that the generous overall approach that we have taken to the price caps and glide path more than adequately addresses any concerns (see Section 9.6).

6.6 Comments on Implications for GCC public policy

254. A few MNOs argued that the GCC is not a Single Market in the sense in which Europe is, and that these goals are not appropriate for the GCC.

255. A number of stakeholders, even if they acknowledged the importance of regional integration and cohesion, questioned whether reducing retail prices for IMR would have much impact on regional integration and cohesion.

RWG response: The rationale for the existence of the GCC is to enhance efficiency and regional integration. This is ultimately a political judgment.

256. Some stakeholders argued that voluntary bilateral arrangements between pairs of countries could be more effective than a regulated GCC solution.

RWG response: In a number of instances, voluntary bilateral arrangements between countries have had little or no effect.

There could be a good case for bilateral, reciprocal regulatory arrangements between countries where those countries choose to do so (rather than just vague undertakings as in the Russia-Poland case). Bilateral approaches are most effective in the absence of supra-national authorities such as the EU and the GCC, but only a "second-best" and piecemeal approach when a supra-national option is available.

The RWG is strongly of the view that a GCC-wide regulatory approach should be preferred.

257. One MNO argued that "almost 47% of the population of the GCC member states is expatriates and shifting the benefits from the MNOs to customers, with this percentage of expatriates, means shifting the money from the GCC economies to none GCC economies in the form of foreign remittances."

RWG response: It is difficult to judge how much of the benefit remains within the GCC region. Many of the expatriates work for local companies, for instance, in which case local businesses who employ these expatriates and send them abroad for work meetings save on their business roaming bills.

In any case, we believe that the correct objective is to promote better pricing for the benefit of all consumers who reside in the GCC, regardless of their nationality.

Aside from this, the gains to the effectiveness of commerce in the region are likely to be important, and can be expected to generate macroeconomic spill-overs into the broader economy.

Once again, this is a ultimately a political judgment.

258. As previously noted, many stakeholders argued that substitutes (including OTT services) are more effective than is claimed in the Consultation Document. Some point to services such as Skype and Viber. Some note that Wi-Fi availability in hotels and malls is widespread in the region. Some suggested that LTE break-out, or new technology from Apple, or from the GSMA, would soon make IMR services irrelevant.

RWG response: Substitutes are clearly important; however, if substitutes were highly effective today, it seems unlikely that prices or usage of IMR services in the GCC region would be at present levels. In any case, respondents did not supply any concrete evidence (e.g. surveys, statistics) demonstrating the precise impact of these alternatives on roaming services (such as a drop in roaming voice volumes in the initial period after Skype became widely used).

As we explain in Section 7.2, all available substitutes have significant limitations. "Plastic roaming" (where the consumer inserts a local SIM into the mobile phone upon arrival in another country), for instance, does not enable the user to receive calls on his or her usual telephone number, and typically requires a different SIM (and thus a search to determine a good price) in each country that the consumer regularly visits. Wi-Fi services often entail cost, may have quality problems, are not truly mobile, are

not available everywhere, and do not substitute for roaming voice services in member states where VoIP is prohibited.

Innovative technology may indeed make IMR services less important over time, but there have been claims to this effect for many years, most of which have not materialised. If substitutes were indeed to become highly effective in the near future, then any regulatory initiatives undertaken should be reconsidered.

259. A number of stakeholders argued that retail prices are not excessive relative to Home Network costs. They argue that retail price controls have adverse effects, and may undermine competition in the GCC region. A number of the MNOs that put forward arguments along these lines were supportive of regulation of wholesale IOTs (sometimes by means of a minimum rather than a maximum charge), but not of retail regulation.

RWG response: The RWG agrees with these stakeholder comments that IMR wholesale level over-pricing is greater than retail level over-pricing in the GCC region, and we accept to some degree the stakeholder arguments that a different approach might be considered at wholesale versus at retail level.

In the view of the RWG, the proper objectives here relate to consumer protection, to achieving prices on behalf of consumers that are broadly reflective of true costs, and to thus enabling and promoting use of mobile services while roaming in another GCC member state. Achieving these objectives appears to depend on retail level price controls – a purely wholesale level approach would not necessarily result in wholesale price reductions flowing through to consumers in the form of retail price reductions, especially in member states where competition is not particularly strong.

The RWG is therefore of the view that retail price controls are indispensable.

260. Some stakeholders argued that the substantial investments that MNOs are making in deployment of new infrastructure needs to be taken into account.

RWG response: In regulatory practice, it is often necessary to consider possible dynamic effects and impacts on investment and innovation; however, where prices seem to be as greatly out of line with underlying costs as appears to be the case for many aspects of IMR in the GCC region, regulatory intervention is often justified.

The prices in this report have been adjusted so as to ensure that mobile network operators achieve a return that is at least in the range of the pre-tax Weighted Average Cost of Capital (WACC), even in those GCC member states that have the highest costs. This should be sufficient to enable investment. In GCC member states with lower costs, this practice should enable mobile network operators to achieve generous returns on their investments.

Perhaps most significantly, the approach that we have taken with price caps and glide paths seeks to maintain overall IMR revenues at levels similar to those of 2015. This generous approach should mitigate any concerns.

261. Some stakeholders suggested that differences among the member states needed more attention. Inflation, labour costs, restrictions on OTT services, and monopolies on international gateways were among the potentially important differences that were identified.

RWG response: The RWG has considered this matter carefully. For many of the factors named, the differences amongst the GCC member states are not very large; consequently, averaging the rates would seem to be the most suitable approach.

For some factors (such as tax rates, or the presence of a non-liberalised international gateway), however, the differences are substantial. In those cases, the RWG has proposed rates that seek to specifically ensure that mobile network operators achieve a return that is at least in the range of the pre-tax Weighted Average Cost of Capital (WACC), even in those GCC member states that have the highest costs.

262. A number of stakeholders argued that more attention was needed to the differences between net payers and net receivers at wholesale level, and to the fact that some small MNOs lack both scale economies and bargaining power in wholesale negotiations.

RWG response: The RWG is generally of the view that IMR arrangements should be consistent, as much as possible, across the GCC. We recognise that differences in bargaining power could be problematic for some small mobile network operators, but we feel that this is an issue that the network operators have to deal with themselves. This is not the task of regulation.

263. A number of stakeholders noted an ongoing need to deal with fraud. Moreover, differences in technology and in SIM registration practices allegedly raise network security and even national security challenges that would benefit from a regional approach.

RWG response: The RWG views these concerns as legitimate, but they are beyond the scope of the current exercise.

6.7 Comments on the Impact of the Current Regulation

264. Numerous comments relate to the level of the Price Elasticity of Demand (PED). Here, we used European estimates of the PED for calls made, calls received, SMS, and IMR data, since no GCC region estimates were available.

265. Most MNOs argued that the use of European PEDs was inappropriate for the GCC region. Some claimed that they had seen very little evidence of consumer response to lower IMR prices after the present regulation was introduced.

266. Some argue that an increase of 11% in voice calls made, as reported in the Consultation Document, is not great enough to justify the investment of time and attention that has been made to date. One argues that the document is self-contradictory in describing this increase at one point as “significant”, yet at another as representing a “slight increase”.

267. Others argue that any growth in IMR usage may have resulted from factors other than regulatory reductions in retail price. One for instance mentions “…increase of travel, purchasing power, economic growth, increase of government spending, oil prices, as well as operator’s offers of

packages, market penetration, handset penetration, increase of bandwidth and technology shift from 2G to 3G …"

268. Most MNOs argued that the sharp decline in IMR calls received in Saudi Arabia should be understood, not in terms of the PED for IMR, but rather as a scheme to bypass charges for international calls. Many also argued that the arrangement had caused harm by distorting SIM usage in the region. One MNO explains that "… the dramatic changes reflect the closure of a 'grey market' or arbitrage opportunity where local SIM cards were purchased by individuals living in KSA and provided to family members/friends living in other countries. With a regime of no fees for receiving calls whilst roaming, individuals were able to substitute international calls with IMR calls, thus effectively making international calls for the cost of a national mobile call."

269. Interestingly, however, one large MNO presented data that they had developed based on their own customer base that appears to demonstrate that *the PED for IMR calls made is broadly consistent with the corresponding PEDs that have been calculated for Europe*. Comparing the volume of calls made and the average retail price in local currency before and after the regulation took effect, they estimate a PED of -0.20 for local calls, and a PED of -0.23 for calls home and to other GCC countries. They write that these "… high level results are in line with international benchmark results listed in the Consultation (section 9.3). Therefore, [we do not] see any reason to assume that the elasticity value in the GCC … could be higher than other areas. … Indeed, the Consultation itself, in paragraph (282), has estimated the price elasticity of demand across the GCC area to be around -0.27 for voice roaming services."

270. The European PED for IMR roaming data is much higher than that for calls made, calls received, or SMS. No stakeholder challenged this observation.

RWG response: The only concrete data that was presented by stakeholders seems to strongly support the relevance of the European price elasticity of demand to the GCC region. We have continued to use it in the current document.

We see no contradiction in stating that the increase is relatively small but still significant.

The concern that the increase in usage may not solely be a result from having lowered the retail price of IMR calls made is a fair point. The data provided by the MNOs, and for that matter other indicators for countries in the region, are not good enough to enable us to disentangle any other effects that might have come into play. An increase of 11% might well be too high. It is equally true, however, that other considerations might imply that the 11% measured effect is too low – for instance, the likely time lag between a reduction in retail price and its full reflection in consumption patterns (which, according to one study, could be as much as two years).[52] It is also possible that GCC consumers were nor fully aware of the price reductions.

The European results used in the Consultation Document, and also in this report, were based on data of sufficient quality and quantity to enable more robust analysis than is possible today in the GCC. On balance, the RWG is therefore of the view that it is appropriate to continue to base our analysis of welfare effects on the assessment of European IMR behaviour developed by Hörnig.[53]

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52 Christian Growitsch, Christian Wernick, and J. Scott Marcus, "The Effects of Lower Mobile Termination Rates (MTRs) on Retail Price and Demand", a research project for the German BNetzA, available at: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1586464.

53 European Commission (2011), Commission Staff Working Paper: Impact Assessment of Policy Options in Relation to the Commission's Review of the Functioning of Regulation (EC) No 544/2009 of the

The RWG wishes to note once again that the price elasticity of demand for IMR data, which appears to be roughly five times as great as for voice, is an important factor that is easily overlooked.

As regards the concerns expressed over the sharp decline in IMR calls received in Saudi Arabia, the RWG has considered the matter carefully. The RWG acknowledges that the arrangement served primarily as a means of bypassing charges for international calls, but that does mean that it is irrelevant to a discussion of the PED of IMR. In reality, it serves instead not only to reinforce the fact that consumers react to price change, and also the fact that there are important cross substitution effects among a range of different services.

271. Several responses note that the current regulation has reduced MNO earnings due to the relatively low PED for IMR voice calls made.

RWG response: This is correct for voice calls and SMS, but not necessarily for data roaming. Regulation of data roaming, as put forward in this document, should not be expected to greatly reduce MNO revenues, assuming that the PED for those services is similar to that in Europe (which seems reasonable, based on the data presented earlier in this section).

Nevertheless, in light of the concerns expressed by the MNOs, we have recommended price cap levels and a price cap glide path that seek to maintain overall MNO IMR revenues at levels no less than those of 2015 (see Section 9.6).

In the view of the RWG, the appropriate goal is to maximise societal welfare, which is the sum of producer welfare (i.e. MNO welfare) and consumer welfare. The approach taken here attempts to strike an appropriate balance between the two.

272. One respondent asks what assumptions were made about the incremental costs of supply?

RWG response: In light of limitations in the data, we assume an average cost per unit that does not change, which implies a flat supply curve.

6.8 Comments on measures to be taken

273. Interestingly, a number of stakeholders preferred to use *special drawing rights (SDRs)* rather than USD as the basis for defining any prices that might be controlled. One notes that SDR is "the official settlement currency used in roaming between operators. As the currency can be converted into any other currency via the BARG website, it is unnecessary to change to USD if the SDR currency is locked when the final decision is made." Another notes that "… recent fluctuations in USD indicate risk for future transactions."

RWG response: Taking this stakeholder feedback into account, and also acknowledging that the SDR is likely to be more stable than any single currency, the RWG recommends that IMR price cap levels continue to be set using SDR. In this

European Parliament and of the Council of 18 June 2009 on Roaming on Public Mobile Telephone Networks within the Community.

report, however, we continue to express prices in US dollars. For prices in effect as of 1 January 2016, we propose using exchange rates in effect as of 30 April 2015.

6.9 Comments on Selecting Policies and Practices for Possible Price Controls

274. Most MNOs argued that price controls are unnecessary and inappropriate.

275. Numerous stakeholders have argued that, if price controls are to be implemented at all, the levels should be less stringent, and a glide path is needed. One claimed, for instance, that the proposed levels of wholesale caps "…are very aggressive and may cause market shocks and disturbance."

RWG response: The rationale for price controls is discussed at length in Chapter 9.

Based on responses to the Consultation, the RWG agrees that the levels of price controls should be higher than in the Consultation Document. There is a conspicuous need to accommodate taxes, and the cost of the international gateway in Kuwait. Chapters 5 and 9 reflect these considerations.

The RWG also agrees that the use of a glide path is appropriate (see Chapters 9, and especially Section 9.6).

276. As previously noted, several MNOs argue for wholesale-only regulation.

RWG response: We agree with stakeholder comments that misalignment between price and cost in the GCC region is much more a concern at wholesale level than at retail; nonetheless, retail regulation remains essential. The benefits to the GCC region that the RWG views as being essential flow from retail price reductions. There is good reason to doubt that reductions in wholesale prices would be fully pass through to consumers in the absence of retail price controls (see Section 9.3).

277. A number of MNOs argued that, if both retail and wholesale price controls were implemented, then a lag of either three months or six months after implementation of wholesale price controls would be appropriate before implementing any retail price controls.

RWG response: We recognise that delays in implementation of wholesale caps meant that many GCC MNOs were forced to operate IMR services at a loss for as much as nine months. We believe that a lag of three months is sufficient to enable GCC regulatory authorities to ensure that wholesale caps are in place before the retail prices that depend on them. This approach is fully reflected in the price cap arrangements that appear in Chapter 9.

278. Most MNOs opposed extending price controls to calls received, SMS, and data.

279. There was particularly strong opposition to price controls for SMS. Multiple stakeholders observe that SMS is in decline. One says: "SMS has suffered a significant decline over the years as it has been replaced by OTT services such as WhatsApp, Skype and others."

RWG response: The RWG is of the view that a comprehensive approach is needed.

The case for extending price controls to roaming data is particularly strong, not only because this is the service of the future (for which volumes are increasing), but also

because the price elasticity of demand (PED) for data roaming appears to be much higher than the PED for calls made (see Section 8.3).

The relevance of price controls to SMS is discussed elsewhere (see Section 6.5).

There is significant cross-substitutability among IMR services.[54] A consumer has for example the option, instead of placing a call while roaming, to send an SMS and ask to be called. Imposing price controls on some of the relevant IMR services but not on others is likely to distort markets (as is arguably already the case today, where IMR calls made are subject to price controls but IMR calls received are not).

In terms of consumer protection, the RWG is of the view that consumers are not well served by a fragmented approach. An approach where all of the main IMR services are subject to similar controls is much easier to understand than an approach where some services are subject to controls while others are not. Comparisons between competing plans are easier for consumers.

280. One stakeholder claims that the normal international mobile price for SMS in their country is roughly twice as high as the retail price cap put forward in the Consultation Document. They also argue that the proposed price cap for calls made is "is less than the average international call price to some GCC countries in many of local mobile packages". Based on this, they are "…deeply concerned on the possible negative impact that the proposed caps will have on the local mobile markets".

RWG response: The RWG agrees with the principle that retail prices for IMR services must not be forced to levels below those of typical domestic or international services; otherwise, there would be a risk of introducing damage and arbitrage into domestic mobile markets.

Having reviewed the issue, the RWG is of the view that the price caps proposed in the original Consultation Document were lower than commercial pricing for DDI services in almost all cases. The few anomalies that are visible generally relate to international (DDI) SMS. The RWG is of the view that, if there is an issue here at all, it reflects a problem in pricing of international (DDI) SMS.

The revised price caps put forward in this Final Report are substantially more generous overall than those in the original Consultation Document. The RWG is of the view that this fully addresses the concern.

281. A number of responses indicate that retail prices for data roaming are already substantially lower than the caps proposed in the Consultation Document.

RWG response: Setting a cap at a level above current prices does no harm, as long as the cap is set in such a way that the MNO retains retail pricing flexibility.

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54 This is also visible in the analysis by the economist Steffen Hörnig. See European Commission (2011), Commission Staff Working Paper: Impact Assessment of Policy Options in Relation to the Commission's Review of the Functioning of Regulation (EC) No 544/2009 of the European Parliament and of the Council of 18 June 2009 on Roaming on Public Mobile Telephone Networks within the Community.

282. There are numerous claims that Wi-Fi, traffic off-load, and OTT applications need to be better understood before any controls are applied to data roaming. Concerns were expressed over negative impacts on innovation.

RWG response: The RWG is of the view that a balanced approach is needed to the promotion of innovation. If prices for roaming data are higher than they need to be, that clearly also has a negative impact on innovation and on the take-up and use of data-based services.

While we are well aware of the growing relevance of Wi-Fi, traffic off-load, and OTT applications, we cannot know when they will become effective price constraints on international data roaming. As previously noted, there are limits to the effectiveness of each of these as a substitute for IMR.

283. Stakeholders agreed that regulation of MMS and of video calls is unnecessary and unwarranted.

RWG response: The RWG agrees. No price controls have been proposed.

284. There was widespread support, if pricing controls are implemented, that retail pricing flexibility should somehow be maintained. One stakeholder, for instance, argued "…that MNOs should be given the flexibility to offer alternative packages and offers that meet customers various needs. Indeed, such approach will enhance competition and motivate creativity and innovation."

285. The same stakeholder went on to say that monitoring pricing practices should not be difficult. "RWG must be aware that the majority of, if not all, GCC MNOs are subject to local price control regulations regarding retails charges. Therefore, it is very easy for NRAs to monitor such packages to ensure that those prices are not substantially higher than those permitted under any possible regulated prices." Most stakeholders agree that monitoring is feasible, but some argue that it is unnecessary in a competitive market.

RWG response: We agree with the need for pricing flexibility.

As regards monitoring, we believe that national regulatory authorities should be empowered to monitor retail plans (which is already the case in many GCC member states); however, we believe that retail pricing arrangements should, in general, be left to market mechanisms.

The RWG is nonetheless of the view that IMR pricing plans that are certain to lead to higher prices that the price caps (for example, bundles that imply higher average rates even if 100% of the bundle is consumed) are inappropriate. The RWG calls on national regulatory authorities to use whatever procedures they deem appropriate so as to ensure that this is not the case (see Section 9.4).

286. Views regarding a price floor for wholesale IOT levels were mixed, with five MNOs in favour and seven against.

RWG response: The RWG infers that (possibly small) MNOs that are net recipients at wholesale level support a price floor, while net payers often oppose it.

A similar division is visible in attitudes as to whether regulation should require that rates be symmetric.

We have not recommended either a requirement for symmetry or an IOT price floor. Doing so would risk building long term inefficiencies into the system. However, the RWG will continue to monitor the issue.

287. One stakeholder argues that there is evidence of implementation in Europe of procompetitive regulatory approaches such as Alternative Roaming Provider (ARP) and Local Break-Out (LBO). They also question whether these approaches are difficult to implement.

RWG response: There is strong evidence to the contrary. In Europe, the Council (i.e. heads of state) have considered possible elimination of these requirements.

Some European network operators have informally reported costs of more than five million euro per country to implement ARP (which has been implemented even though it is apparently not being used).

6.10 Comments about Supporting Measures

288. Many MNOs expressed concerns about maintaining the confidentiality of the data provided.

RWG response: The data can be collected and maintained in a manner that sufficiently ensures the confidentiality of proprietary data. For example, data aggregation could first occur at country level, and then be aggregated by the GCC Statistical Office.

A specific procedure will need to be worked out between GCC and national authorities. The details are beyond the scope of the current exercise.

289. Several MNOs argued that the data collection would be burdensome.

RWG response: Given that nearly every MNO asked for better monitoring of the effects of any actions that are taken, the collection of solid data is clearly essential, and should commence if possible before actions come into force.

290. Some MNOs expressed concerns that statistics collection will be done more rigorously in some member states than in others, resulting in unequal burdens and in data of uneven quality.

RWG response: The RWG acknowledges the need for national authorities to ensure that the data collection is carried through with due care in all GCC member states.

291. Most stakeholders consider per-second billing for voice calls to be inappropriately burdensome. Stakeholders strongly opposed the introduction of a standard billing unit for data.

RWG response: The RWG acknowledges the concerns of these stakeholders. In this context, at this time the RWG will not recommend regulated per-second billing for voice or per-10KB billing for data. We are leaving room for operators to introduce such innovative changes on a commercial basis, as a form of product differentiation. However, the RWG considers it appropriate to recommend maximum billing units: per minute for voice, and per-MB for data offers based on volume of usage.

292. As regards measures to protect consumers from bill shocks, all respondents have measures in place, and most noted that they are constantly seeking ways to improve them. They are generally receptive to reasonable measures to reduce the risk of bill shock.

RWG response: We recognise the efforts made by some MNOs in the region (see also Section 10.3).

293. Stakeholders view LTE-related developments as important to the region, but most saw no need for regulators or policymakers to take specific actions at this time.

RWG response: The RWG approach is technology-neutral. We have not proposed LTE-specific actions at this time.

294. All stakeholders accepted the need to periodically review any initiatives that are taken. The suggested time frame varied, with some proposing one year, some two years, some three.

RWG response: By 31 December 2018, the RWG will decide whether reasonable grounds exist to commence a review of the roaming regulation. In the interim, the RWG will monitor data collected from operators.

7 Implications for GCC public policy

295. This chapter discusses the public policy implications of IMR for the GCC, and explores whether policy interventions at the GCC level might be justified in general.

296. The chapter also covers issues related to the high prices that prevail for IMR services, and discusses the lack of comprehensive and effective substitutes that makes the problem difficult to correct.

297. It also explains the potential benefits to the region, not only in terms of direct enhancement of societal welfare through reduction in deadweight loss, but also in terms of enhanced economic integration and social cohesion for the GCC region.

298. Last but not least, the chapter touches base briefly on the consumer protection aspects of IMR, in terms of ensuring that consumers are well informed and that bill shocks are avoided.

299. Finally, and based on all the above, the chapter discusses the suggested objectives for the GCC in terms of its approach to IMR.

7.1 High prices for international mobile roaming services

300. Not only within the GCC region, but also globally, IMR has been a topic of intense discussion and concern for many years now. It is widely acknowledged that, in the absence of intervention by governments or regulators, the prices that consumers pay for IMR services tend to be high in relation both to comparable domestic prices and to the real underlying cost of providing these services.

301. A recent study on behalf of the International Telecommunications Union ("ITU")[55] observes: "There is now general agreement that the price of IMR communication services is high and is well above cost."[56]

302. Indeed, the ITU has issued a Recommendation to address the issue, in which they note that "Member States, regulators and consumers continue to express concern about the high level of charges incurred when roaming internationally and especially in the case of 'bill shock' (i.e., a bill which the consumer finds unexpectedly excessive)."[57]

303. Concerns over allegedly high prices for IMR (especially at the wholesale level) have been raised in the GCC region as well. The prices and costs of IMR for calls made to GCC countries other than the visited country, SMS made, and roaming data services appear in *Table 6* (for the home network) and *Table 7* (for the visited network), respectively. The prices shown for voice calls made are for GCC member states other than Kuwait, where charges for the use of the international gateway come into play. The specific changes proposed to address these prices are assessed in Sections 9.7, 9.8, 9.9, and 9.10, respectively.

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55 Dimitri Ypsilanti (2013), "International mobile roaming services: Facilitating competition and protecting users", ITU.

56 See for instance OECD (2009), International mobile roaming charging in the OECD area, DSTI/ICCP/CISP(2009)8/FINAL, Paris, 2009, http://www.oecd.org/dataoecd/41/40/44381810.pdf; European Commission (2011), Impact assessment of policy options in relation to … roaming on public mobile telephone networks within the Community, SEC(2011) 870 Final, http://ec.europa.eu/information_society/activities/roaming/docs/impac_ass_11.pdf; Peter Stuckmann (2012), European Commission, EU Roaming Regulation – towards structural solutions, March 2012, Geneva, www.wto.org/english/tratop_e/serv_e/sym_march12_e/sym_march12_e.htm.

57 ITU (2012), "Charging in international mobile roaming service", Recommendation ITU T D.98.

Table 6 - Home network estimated average costs versus revenues (in USD)

	Unit	Costs	Revenues
Calls made (international GCC)	minute	0.65	0.70
SMS sent	SMS	0.26	0.47
Data	MB	6.46	6.11

Table 7 - Visited network estimated average costs versus revenues (in USD)

	Unit	Costs	Revenues
Calls made (international GCC)	minute	0.20	0.48
SMS sent	SMS	0.01	0.19
Data	MB	0.12	4.95

7.2 A lack of good, comprehensive substitutes for international mobile roaming services

304. Highly motivated business travellers and tourists have always had ways to get around the high price of IMR; however, none of these has provided a complete and convenient replacement or substitute for IMR services.[58] In economic terms, these work-arounds constitute *imperfect substitutes* for IMR services. Indeed, if roaming were not perceived as being high priced, it is likely that few of these alternatives would see much use.

305. The most obvious is so-called "plastic roaming", which describes a situation where a user with an unlocked handset purchases a subscription (and a SIM card) for a country to which he or she frequently travels.[59] Although the roamer will no longer be contactable on his or her home number, this can work reasonably well if there are only one or two countries to which the roaming individual travels regularly. It is less useful if the roamer visits multiple countries briefly and unpredictably, since the roamer has to choose a network operator in each visited country (implying *search costs*), and has to obtain or maintain services in each country.

306. The use of Wi-Fi Internet access in (for instance) the roamer's hotel (together with the use of Over-the-Top services such as Skype, WhatsApp and Viber) provides another important means of avoiding high IMR charges. Wi-Fi is increasingly widely available in the GCC, and can sometimes work well,[60] but again it has its limitations. First, one is limited to fixed locations where Wi-Fi access is available; thus, the service is not truly mobile. Second, Wi-Fi access may not satisfy needs for voice services, particularly when one considers that the use of Voice over Internet Protocol (VoIP) services is restricted or blocked in a number of GCC member states.

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58 See J. Scott Marcus and Imme Philbeck, "Study on the Options for addressing Competition Problems in the EU Roaming Market", study for the European Commission, available at: http://ec.europa.eu/information_society/activities/roaming/regulation/consult2011/index_en.htm.

59 Suitable mobile plans are sold in many airports, for instance.

60 J. Scott Marcus and John Burns (2013), "The impact of traffic off-loading and related technological trends on the demand for wireless broadband spectrum", a study for the European Commission, available at: http://bookshop.europa.eu/is-bin/INTERSHOP.enfinity/WFS/EU-Bookshop-Site/en_GB/-/EUR/ViewPublication-Start?PublicationKey=KK0113239.

307. In the public consultation, a number of stakeholders argued that new services from Apple would soon render conventional mobile roaming largely obsolete.

308. The GCC region also has experience with multi-national MNOs (notably Zain) offering for instance inexpensive or free calls received while roaming. This service, whatever its merits, has also failed to provide an overall, comprehensive solution. Moreover, concerns that it might be distorting the Saudi competitive environment led the Saudi authorities to impose a minimum price for roamers from Saudi Arabia.

309. A service known as SIMM (single IMSI multi MS-ISDN) local-access could possibly serve as a close substitute for international roaming.[61] The service can be offered to inbound roamers by the visited network via text message. Such services allow the roamer to use the visited destination's services "like a local", without having to switch SIM cards, and without losing the ability to be contacted on his or her original number.

310. If such services became widespread within the GCC, retail roaming margins could be put under significant pressure; however, they are currently offered only in Saudi Arabia and seem to be limited to voice calls, and only to roamers from countries outside the GCC region.[62] There are no indications that this service is likely to be offered in other GCC member states.

311. A similar, but more limited (data only) service of local break-out ("LBO") is associated with (LTE) roaming (see Section 10.4).[63] It might be thought that the roll-out of LBO by GCC operators could help put downward pressure on wholesale costs, and thus on retail prices; however, the timeframe for the roll-out of LTE roaming services in the region is uncertain. Even once they are rolled out, many roamers will remain on 2G and 3G.[64] Even for those who do adopt LTE, it is not certain when operators will activate LBO and, if they do, whether it will actually reduce retail prices (see also Sections 9.1.4 and 10.4).

312. In the long run, one or more of these innovative substitutes might possibly prove to be important. In the nearer term, however, there is no assurance that any of them will ultimately have much effect on the IMR marketplace.

313. MNOs are under only limited competitive pressure to improve their IMR offers due to the limited effectiveness of these partial substitutes.

314. In sum, despite the fact that IMR services are expensive relative to domestic mobile prices and relative to underlying costs (and thus would seem to be an appealing target for competitive substitutes), no good, comprehensive, overall substitute is available to consumers, and there is no assurance that substitutes will have much market impact over the next few years.

7.3 The rationale for action at GCC level

315. There are two interrelated rationales that suggest the need for a policy intervention at the GCC level. Both concerns are, at their core, economic concerns, but they manifest differently.

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61 See, for example, the "Draft Report on Trans-Tasman Roming", August 2012.

62 See, for example, the website of Mobily, at www.mobily.com.sa/portalu/wps/portal/personal/roaming-and-international/visiting-saudi-arabia/local-roaming-number/!ut/p/c4/04_SB8K8xLLM9MSSzPy8xBz9CP0os3gLUwsPd08TIwN_JxdXA09D81AXnzATJ1djA_3g1Dz9gmxHRQBoo6tw/.

63 This should not be confused with the LBO regulatory option that Europe has sought to introduce.

64 LBO could in principle be implemented with 2G or 3G services, but MNOs do not appear to have incentives to deploy such solutions.

- The first has to do with the integration and the social cohesion of the GCC as whole. This is fundamentally a politically driven issue, and not solely an economic matter.
- The second is based on the recognition that consumers and business travellers use their mobile devices differently (and less) when roaming than they do for purely domestic purposes. The usage that is sacrificed represents a direct economic loss for the region, and likely has negative spill-over effects into the broader regional economy. This is primarily a matter of industrial and regulatory policy.

316. It is reasonably clear that individual national regulatory authorities acting independently of one another have only limited ability to address IMR issues in the GCC region. The retail price charged in one member state for IMR services depends crucially on the wholesale IOTs charged in the other GCC member states. If action is to be taken, coordinated action may be called for.

7.3.1 Regional integration and social cohesion

317. The GCC Charter[65] and the Economic Agreement of 2001[66] make clear and explicit the desire for greater regional integration and social cohesion. Scale economies and a stronger bargaining position in any international negotiations are clear objectives.

318. According to the Preamble to the GCC Charter, the GCC member states share "the conviction that coordination, cooperation, and integration between them serve the sublime objectives of the Arab Nation". In this regard, the RWG considers that the reduction of retail roaming prices would promote economic integration among the GCC member states, and would strengthen GCC ties and social cohesion.

319. Integration involves the removal of economic and other barriers among GCC member states. High retail roaming prices constitute such a barrier. This has been recognised by numerous governments in many regions.

320. Among the objectives expressed in Article 4 of the Charter, the GCC seeks:

- To effect coordination, integration and inter-connection between GCC member states in all fields in order to achieve unity between them.
- To deepen and strengthen relations, links and areas of cooperation now prevailing between their peoples in various fields.
- To stimulate scientific and technological progress in the fields of industry, mining, agriculture, water and animal resources; to establish scientific research; to establish joint ventures and encourage cooperation by the private sector for the good of their peoples.

321. The Economic Agreement between the GCC member states of 31 December 2001 builds on this foundation. It calls for "enhancing and strengthening economic ties among countries, and harmonizing their economic, financial and monetary policies, their commercial and industrial legislation and customs laws applicable therein, …; and seeking to achieve advanced stages of economic integration that would lead to a Common Market … among countries according to a specific timetable, while enhancing market mechanisms and fostering the role of the private sector; and desiring to enhance the economy of the GCC countries in the light of recent global economic

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65 Available at: http://www.gcc-sg.org/eng/indexfc7a.html.

66 Secretariat General of the Cooperation Council for the Arab States of the Gulf (GCC) (2001), The Economic Agreement between the GCC States, adopted by the GCC Supreme Council (22nd Session; 31 December 2001) in the City of Muscat, Sultanate of Oman, available at: http://sites.gcc-sg.org/DLibrary/download.php?B=168.

developments, which require further integration among the countries to strengthen their negotiating position and competitive capacity in international markets …"

322. Converged regulation was explicitly viewed from the first as a means of achieving economic integration and social cohesion. Article 4 of the GCC Charter calls for formulating similar regulations in various fields including the following: Economic and financial affairs; Commerce, customs and communications; and Education and culture. Article 24 of the Economic Treaty of 2001 amplifies this focus on convergence of regulation of telecommunications: "Countries shall take all the necessary measures to ensure the integration of their communication policies, including telecommunication, post and data network services, which would lead to improving their service levels and economic efficiency and to strengthening the ties between GCC citizens as well as private and public institutions."

323. If the GCC had already achieved the ideal, desired Common Market, it is reasonably clear that prices for telecommunications between the GCC member states would not differ from one another to a greater degree than the difference in underlying costs. As already noted in Section 7.1, this is clearly not the case today.

324. The precise direct economic impact of lower retail prices on GCC integration will depend on the extent of the drop in prices (price level), and the extent to which roamers respond by using roaming services more (price elasticity); however, given the significant volume of intra-GCC trade, even a small impact could reap material gains for the region by enabling businesses to work more efficiently across borders. In other words, spill-over effects from enhanced economic integration might greatly exceed direct economic benefits.

325. As explained in Section 7.3.2, inflated prices also lead to societal costs. GCC business travellers are less well connected to colleagues at home and abroad than they would otherwise be when travelling in other GCC member states. The GCC is a family of countries with a shared history and culture. Its citizens travel often from their own country to others in the GCC region. At the IMR prices that prevail today, GCC tourists are not as well connected to friends and family than they ought to be while travelling. The effectiveness of electronic commerce is impacted when GCC business people and consumers are on the road.[67]

326. Imposing lower retail roaming prices for the GCC region would acknowledge and strengthen this sense of family. Travelling to another GCC member state would become more and more like being in one's home country, and less and less like travelling outside the GCC. In other words, at a grass-roots level, GCC ties would be strengthened.

327. Lower retail roaming prices would also make it easier for GCC travellers to remain in touch with family and friends at home. This would in turn make intra-GCC travel more appealing, and hence would potentially increase such travel or the length of travellers' stays. More or longer intra-GCC travel would further strengthen GCC ties.

7.3.2 Industrial policy and regulatory objectives

328. The detailed effects of high prices for IMR are best understood by means of survey results. Consumer research of IMR usage in the GCC region is not available, but the results from European

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67 Article 25 of the *Economic Agreement between the GCC States* of 31 December 2001 recognises the benefits of an effective GCC environment for electronic commerce. It calls on GCC Member states to "…take all necessary actions to facilitate banking and trade exchange through electronic means of communication, and unify their electronic commerce legislation."

consumer surveys are clear, and it is fair to assume that GCC consumers would react in similar ways.

329. A 2014 survey of 28,000 Europeans[68] establishes that, when travelling within Europe but outside of their home country:

- 47% of Europeans never use mobile Internet at all because of mobile roaming charges.
- Only about 10% use e-mails in the same way as at home.
- Only 6% use Facebook and similar services in the same way as at home.
- More than 25% simply switch off their mobile devices when they travel.
- Millions use SMS rather than paying for voice calls.

330. Each of these characteristics can be viewed as a symptom of high prices. The consumption that should have taken place, but did not, can be viewed as a *deadweight loss.* Each is a loss to the economy as a whole, similar to the loss that society would experience due to over-pricing on the part of a monopolist.

331. It is noteworthy that, even after six years of IMR price reductions in Europe, prices for all forms of IMR were still viewed as being prohibitively high.[69] The placing of voice calls while roaming is measurably greater than in 2007, apparently as a direct result of lower prices; however, the increase in the number of roaming voice call minutes placed is not as great as might ideally be hoped for because prices are still perceived as being fairly high (see also Section 8.3).

332. As explained in Section 4.4.1, the data captured in the survey of GCC MNOs suggests a significant increase in the volume of voice calls placed while roaming in the GCC after the GCC Regulation came fully into effect early in 2012, consistent with European results; however, just as in Europe, the increase is not yet dramatic (see Section 8.3). The limited response to date may reflect (1) once again, the fact that consumers still perceive the price of calls placed while roaming as being high, just as in Europe, and (2) possible time lags in consumers' response to price changes.[70]

333. Network operators sometimes erroneously claim[71] that there is no significant tendency for consumers to increase their use of roaming services as the price of roaming declines (i.e. that there is little or no price elasticity of demand). These claims are off the mark in several important respects, as explained in Section 8.3:

- Demand for roaming data is roughly five times as responsive to changes in price as is demand to make calls while roaming (see also Section 8.3).[72]

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68 See European Commission (2014), "Roaming: 300 million extra customers for telecoms companies when roaming charges end, survey shows", 17 February 2014, at http://europa.eu/rapid/press-release_IP-14-152_en.htm.

69 See European Commission (2014), "Roaming: 300 million extra customers for telecoms companies when roaming charges end, survey shows", 17 February 2014, at http://europa.eu/rapid/press-release_IP-14-152_en.htm.

70 It can take as much as eight quarters for these effects to be fully visible. See Christian Growitsch, J. Scott Marcus and Christian Wernick (2009), "The Effects of Lower Mobile Termination Rates (MTRs) on Retail Price and Demand", a research project for the German BNetzA, available at: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1586464.

71 This was visible in some of the correspondence associated with the survey of GCC MNOs.

72 See Stefan Hoernig (2011), in European Commission, "Commission Staff Working Paper: Impact Assessment Of Policy Options in Relation to the Commission's Review of the Functioning of Regulation (EC) No 544/2009 of The European Parliament and of the Council of 18 June 2009 on Roaming on Public Mobile Telephone Networks within the Community". This is a European result, but it is reasonable

- Multiple studies have shown that consumers increase the calls that they make while roaming in response to lower roaming prices (see Section 8.3).[73]

334. Demand for roaming voice calls made, voice calls received, SMS and data services is interlinked. Whether these services should be viewed as economic substitutes rather than economic complements for one another is a complex empirical question; however, it is clear that these services are somewhat substitutable for one another in practice (i.e. they function as *imperfect substitutes* for one another).[74] Receiving a call substitutes for placing a call (e.g. a traveller dials his or her home, but hangs up before the phone is answered, and then waits to be called back). OTT application such as WhatsApp (using Data services) can substitute for SMS messaging. The use of services based on *Voice over the Internet Protocol (VoIP)* can substitute for conventional voice calls in those GCC member states where the use of VoIP is permitted. This substitutability suggests that an integrated approach is needed to the regulation of all of these services.

335. In the GCC, as in Europe, the consumption of IMR voice, SMS and data services that should have taken place, had IMR rates been more closely aligned to the cost of supplying these services, but did not can be assumed to have ripple effects through the economy as a whole. There can be presumed to have been transactions between parties that were delayed, or perhaps not undertaken at all, due to the expense and inconvenience of implementing them while one or more of the parties were away from their home country.

336. There is also the social cost and inconvenience of calls to family that were not placed, and visits to friends that were not made due to the expense and inconvenience of setting them up while travelling. This is in the same vein as deadweight loss, but it is a cost that is difficult to measure.

7.4 Consumer protection

337. The GCC member states have a clear interest in ensuring that consumers are aware in advance of the price of roaming. Avoiding unexpectedly high bills ("bill shock") is in the interest, not only of GCC consumers, regulators and governments, but also of the mobile network operators in the region. Bill shocks can create bad publicity and customer dissatisfaction, and can also increase customer care costs.

338. All of the GCC member states have legal or regulatory measures in place to ensure that consumers are notified of the price of roaming when they first enter another GCC member state. In Oman, MNOs employ measures to warn consumers if their consumption exceeds expected thresholds.

339. Nonetheless, consumers continue to be surprised by high bills for data roaming in particular. The Oman TRA, for example, reports 26 consumer complaints about roaming in 2013 and early 2014, all of which involve the high cost of data roaming, and there are presumably far more cases that go unreported. In one case reported in the press, "… a woman was charged approximately RO 11,000 nearly 29,000 USD for mainly using WhatsApp on her Oman SIM card during her five-day foreign trip."[75]

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to assume that the price elasticity of demand in the GCC is also much higher for roaming data than for roaming voice calls.

73 The increase in calls made is substantial, but does not fully compensate network operators for lowering their prices.

74 See Stefan Hoernig (2011), op. cit.

75 Mehdi al Lawati (2013), "TRA advises 3G subscribers to be aware of international tariff", muscatdaily.com, 14 August 2013, at http://www.muscatdaily.com/Archive/Oman/TRA-advises-3G-

340. Some of the cases that have appeared in the press involve roaming within the GCC; others involve GCC consumers roaming outside the GCC. To the extent that foreign networks have deployed the necessary capabilities, it would be technically straightforward for GCC MNOs to protect GCC consumers by implementing the same kind of bill shock measures that are in place in Europe and in Oman.

341. Measures should therefore be considered to ensure that consumers are aware of the roaming charges that they are incurring before the charges get out of hand (see Section 10.3).

7.5 Proposed overall goals for GCC international mobile roaming policy

342. For the reasons just noted, the following broad objectives of roaming regulation in the GCC going forward are recommended:

a. Retail prices for roaming within the GCC should be as low as feasible (consistent with being reflective of costs and still allowing a reasonable return (net of tax) on MNO investments). The rationale for low prices reflects multiple industrial policy and regulatory concerns:

   1) The need for increased economic integration (with corresponding societal scale economies) and social cohesion within the GCC region; and

   2) Promotion of greater use of services, with corresponding reduction of deadweight loss.

b. Retail prices must however be consistent with a fair return for a reasonably efficient network operator.

c. Wholesale charges for roaming services (e.g. IOTs) represent a cost to the home network operator; consequently, any measures undertaken in regard to retail prices need to pay due regard to wholesale charges in order to ensure that the roaming service remains profitable (i.e. that revenue continues to exceed cost).

d. Any measures taken should consider both consumer welfare and MNO welfare, since both contribute to societal welfare. With this in mind, a glide path should be selected that avoids abrupt "shocks" and minimises disruption to MNO revenues and profits.

e. Coordination across the various roaming services that are imperfectly substitutable for one another is needed in order to reduce the risk of distortions among them.

f. MNOs should, subject to the above, enjoy as much freedom as possible to offer innovative retail pricing plans for IMR services.[76]

g. Consumer protection measures in order to further reduce the risk of "bill shock" are appropriate. Notification of IMR prices is already largely in place, but additional measures to warn consumers if usage gets out of hand are not implemented in all member states.

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subscribers-to-be-aware-of-international-tariff-2hba. This problem relates not only to travel within the GCC, but also to travel worldwide.

76 See also ITU (2012), "Charging in international mobile roaming service", Recommendation ITU T D.98: "Member states should encourage, taking into account specific national or regional conditions, the development of effectively competitive markets for international mobile roaming on a commercial basis by: … encouraging the provision of roaming pricing plans that allow users to purchase as much international mobile roaming services as they wish in a package that best practically meets their needs and budget …"

8 Effects of the current regulation

343. Section 8.1 summarizes the workings of the current Regulation. Section 8.2 notes the measureable effects. Section 8.3 discusses the consumer response to lower prices (i.e. the *price elasticity of demand* for IMR services). Section 8.4 explains the impact of the current Regulation on societal welfare.

8.1 The current regulation

344. The current Regulation was approved by the GCC Ministerial Committee in its meeting in 2010, and was fully implemented and effective as of 1 February 2012. It set retail and wholesale caps for:

- calls made back home or to another GCC member state; and
- local calls made within a visited GCC member state.

345. The first roaming Regulation set the caps at the following rates (these caps have been fully implemented since 1 February 2012 and are based on SDRs):

- For calls back home or to another GCC member state: retail prices should not be in excess of SDR 0.435 (0.66 USD); wholesale prices (IOTs) should not be in excess of SDR 0.330 (0.50 USD).
- For local calls made within the visited GCC member state: retail prices should not be in excess of SDR 0.181 (0.28 USD); wholesale prices (IOTs) should not be in excess of SDR 0.137 (0.21 USD).

346. The Regulation has been implemented by all six GCC member states. It appears that all GCC MNOs are now in compliance.

347. The first roaming Regulation was specified in terms of SDR. The RWG notes that USD are well understood within the GCC region, and that many of the GCC currencies are linked to the USD. Prices in the Consultation Document and in this report are therefore stated in USD equivalents.

348. In responses to the Consultation Document, a number of stakeholders expressed a strong preference that any price caps in the next regulation be expressed in SDR. They noted that USD prices have fluctuated more in recent months and years than in the past.

349. Recognising the wisdom of the stakeholder responses, the RWG recommends that any price caps once again be expressed in SDR. For prices in effect as of 1 January 2016, we propose using exchange rates in effect as of 9 April 2015.

8.2 Measureable effects

350. There are limitations to what we can say about the effects of the current regulation. As previously noted, data were not systematically collected before the regulation went into effect in 2012, and very few MNOs have been able to provide reliable data for years prior to 2012.

351. Where MNO data was missing or questionable, we have made our best estimates. This has inevitably resulted in a few inconsistencies between estimated and actual data, and between different estimates done for different purposes using slightly different methodologies.

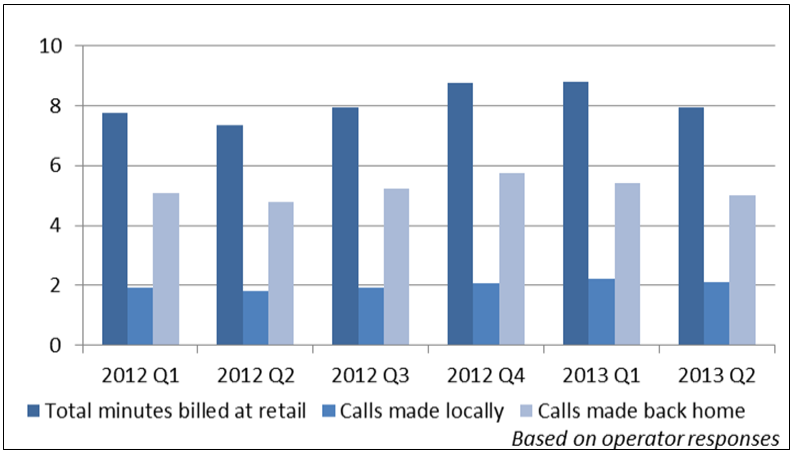
352. In order to assess whether the retail and wholesale caps that the Regulation introduced have been implemented by the operators, and if so what the effects of those caps have been, the RWG has

reviewed the distribution of total outgoing voice calls by call type. Only a small subset (less than 50%) of operators supplied a distribution of outgoing calls that was usable to generate an indication of approximate development of volumes, wholesale charges (IOTs) and revenues. This sample includes mainly smaller operators, which potentially leads to an underestimate of average revenues and an overestimate of average IOTs (because the smaller MNOs tend to have less bargaining power with other MNOs, as well as less pricing power).

353. This analysis is based on regulated outgoing calls made back home and calls made locally in the visited country. Calls to other GCC member states cannot be analysed with the information provided by the survey because most MNOs were unable to provide information that distinguishes between calls to other GCC member states and calls to the rest of the world.

354. Figure 39 indicates that volumes of regulated calls generally increased somewhat within the year 2012, i.e. after the Regulation became fully effective in February 2012. As there are differences between the quarters due to seasonal effects, it makes sense to compare the corresponding quarters. Comparing Q2 2013 to Q2 2012, and Q1 2013 to Q1 2012, there is a slight increase in the number of outgoing calls made; thus, the information provided by the MNOs suggests that the Regulation has contributed to a small positive volume effect. Other factors may have been at work as well.

Figure 39 - OUTGOING VOICE - Traffic generated in the GCC region by call type (subset of MNOs, in millions of minutes)



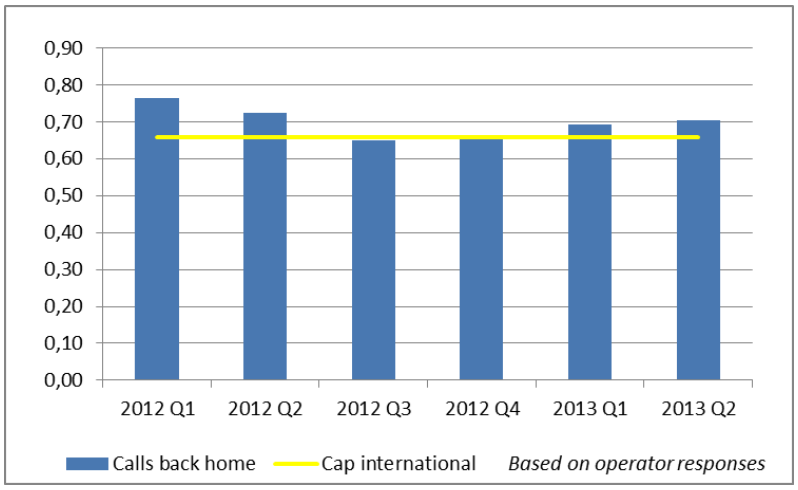
355. The retail prices for calls made back home appear to be appropriate in light of the price caps in the Regulation. This result is based not only on the survey of the GCC mobile network operators, but has also been crosschecked with retail price information provided on the websites of the MNOs.

356. The survey of the network operators enables calculation of retail revenues per minute based on the distribution of outgoing calls; however, as previously noted, the information derives from a small subset of operators who were able to provide the data. The revenue per minute depicted in Figure 40 is primarily based on a subset of smaller MNOs who generally appear to generate lower unit revenues than the larger MNOs. Thus, the true GCC average retail revenue per minute would likely be higher if the sample included all of the larger MNOs.

357. The calculated average retail revenues per minute for calls made back home are in line with the implemented caps inasmuch as they do not differ by more than 30% from the caps (which is the

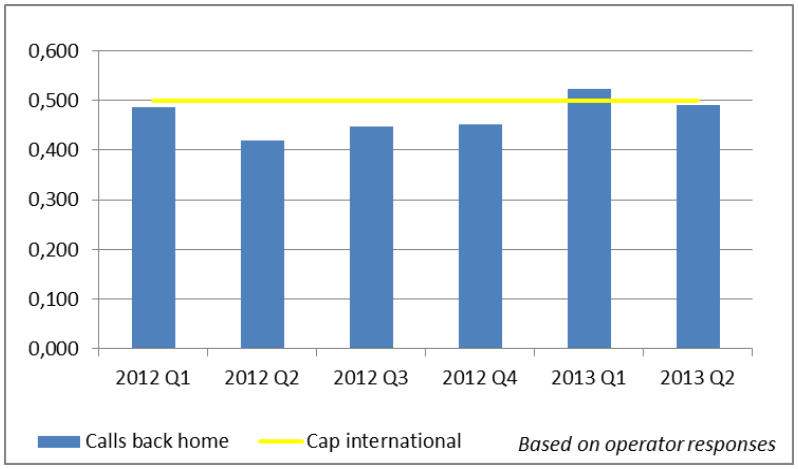
divergence that can be explained solely by the common GCC region practice of rounding up to the next higher minute, as explained in Section 10.2).

Figure 40 - Average retail revenue generated by GCC operators in visited GCC member states for outgoing calls back home (subset of MNOs, in US dollars)



358. As regards average per minute IOTs paid by GCC operators for outgoing calls made, the information submitted by a subset of operators shows that the wholesale cap for calls made back home was substantially met. Given the small sample size that includes mainly smaller operators, average IOTs are likely to be overstated, given that larger operators generally have greater bargaining power and therefore pay lower charges at the wholesale level.

Figure 41 - Average IOTs paid by GCC operators to visited country GCC operators for outgoing calls home (subset of MNOs, in US dollars)



359. Overall, the responses suggest that the Regulation has had a small but significant positive impact on volumes (on the order of 11% year over year, as noted in Section 4.4.1), and that the caps are implemented in the GCC region.

8.3 The effect of price on demand for roaming services (elasticity)

360. The price of a service influences how much of it is consumed. If the price of a service goes up, we tend to consume less; if the price goes down, we tend to consume more.[77] Economists refer to this tendency as the *price elasticity of demand (PED)*.

361. The elasticity of IMR services in Europe has been evaluated in a number of studies. Less is known about the price elasticity of IMR services in the GCC region.

362. Demand elasticity is typically expressed as the ratio between a change in the price of a good or service and the associated change in the amount of that good or service which is consumed. For instance, if a 1% increase in price results in a 1% decrease in consumption, the elasticity is -1.0 (i.e. -1% divided by +1%). Demand elasticity is generally a negative number because a higher price results in lower consumption.

363. A good or service with an elasticity greater in magnitude than -1.0 (i.e. less than -1.0) is said to be *elastic*, or *relatively elastic*. A good or service with an elasticity between zero and -1.0 is said to be *inelastic.* Inelastic demand does not mean that there is no response to a change in price; rather, it signifies that the change in quantity is less than the corresponding change in price.

364. With that established as a preliminary basis, it is useful to review European analyses of the price elasticity of demand for mobile roaming services, and then to consider what is known about price elasticity of demand in the GCC region.

365. In 2008, the GSM Association (GSMA) estimated a price elasticity of demand for Europe for roaming voice calls originated to be "in the order of -0.25".[78]

366. In a study for the European Commission, Marcus and Philbeck (2010) predicted (based on data gathered by the Body of European Regulators of Electronic Communications ("BEREC") that the demand elasticity for IMR voice calls originated would be in the neighbourhood of -0.2.[79]

367. Marcus and Philbeck (2010) also suggests that "if the price of mobile voice roaming were similar to that of normal domestic mobile-to-mobile voice, the long term demand elasticity would also be similar to that of domestic mobile-to-mobile voice".[80]

368. In a more rigorous study conducted for the European Commission in 2011, the economist Steffan Hörnig did an assessment of the demand elasticities of IMR calls placed, calls received, SMS, and data based on comprehensive data assembled by BEREC. Elasticities for all services were calculated jointly, since the services can be considered to be substitutable for one another (e.g.

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77 This tendency is sometimes referred to as the *Law of Demand*.

78 GSMA (2008), "GSM Association response to the public consultation for the Review of the functioning of the Regulation (EC) No 717/2007 (the 'Roaming Regulation') and of its possible extension to SMS and data roaming services", 2 July 2008.

79 J. Scott Marcus and Imme Philbeck (2010), "Study on the Options for addressing Competition Problems in the EU Roaming Market", study for the European Commission, at: http://ec.europa.eu/information_society/activities/roaming/regulation/consult2011/index_en.htm.

80 Consider also the effect on data usage of the flat rate introduced by Telecom New Zealand in December 2012 for data roaming. A press release dated 13 January 2014 indicates that the rate led to "a more than seven-fold increase in international data roaming volumes – that's roughly eight times faster than the increase in domestic data volumes". Available at: www.telecom-media.co.nz/releases_detail.asp?id=3914&page=1&pagesize=10&filtertext=roaming&m1=1&y1=2013&m2=2&y2=2014&filter=filter

data for SMS, calls placed for calls received).[81] The own price elasticity of demand as a function of the evolution of prices and quantities consumed was found to be:

- Calls placed -0.27
- Calls received -0.24
- SMS -0.24
- Data -1.23

369. It is worth noting that the three results (GSMA, Marcus and Philbeck (2010), and Hörnig (2011)) are in close agreement on the demand elasticity of IMR calls placed in Europe: -0.25, -0.2, and -0.27.[82] The Hörnig results are particularly useful inasmuch as they provide estimates of demand elasticity for all four of the services of primary interest.

370. In the Hörnig analysis, the demand elasticity of calls placed and calls received are nearly identical, which is perhaps not surprising since they are somewhat substitutable for one another. SMS is also in the same range. It is striking, however, that the price elasticity of demand for IMR data is roughly five times as great as the price elasticity for voice calls placed or received.[83]

371. The data available to the RWG do not enable us to establish an exact GCC-specific value for the price elasticity of demand (PED) for IMR services, but there is good reason to believe that GCC consumers respond to price changes (especially for roaming data).

372. A number of mobile operators had had special offers in place in Q1 2012 that enabled GCC roamers in Saudi Arabia to receive calls for free. By Q3 2012, these offers had been withdrawn. Average revenue per minute (a good measure of price) for all operators increased by a factor of four. The volume of calls received declined even more, by a factor of six (see Figure 42). The magnitude is dramatic – the decline is greater than the entire volume of calls received for the GCC as a whole subsequent to the withdrawal of the offers. This demonstrates a consumer response to a change in price that is considerably stronger than many experts might have expected.

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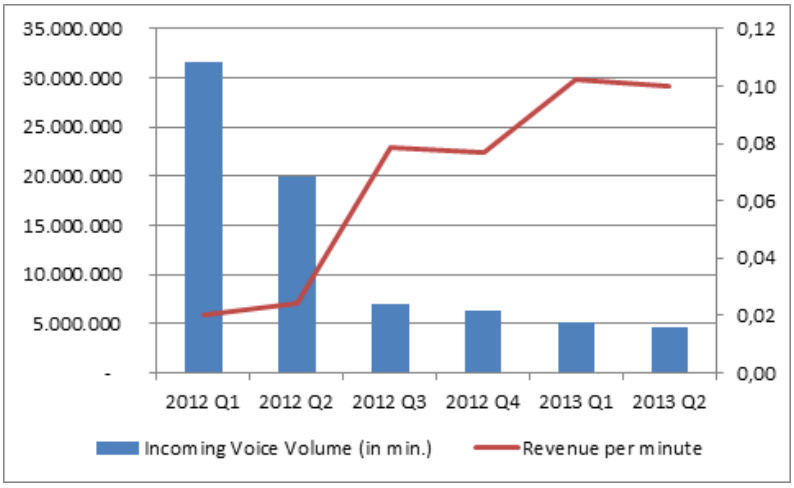
81 European Commission (2011), Commission Staff Working Paper: Impact Assessment of Policy Options in Relation to the Commission's Review of the Functioning of Regulation (EC) No 544/2009 of the European Parliament and of the Council of 18 June 2009 on Roaming on Public Mobile Telephone Networks within the Community.

82 An analysis by Inigo Herguera of the Spanish CMT, however, estimated the price elasticity of demand for calls made to be slightly higher, at -0.44 (see CMT (2009), Report on the Analysis of the International Roaming Service in the Spanish Mobile Telephone Market), and a new result by Saeed Alkatheeri that estimates the demand elasticity of IMR calls placed to be greater in absolute value than -1.0 (see Saeed Alkatheeri (2013), The Economics of Mobile International Roaming).

83 Telefonica and Hutchison Europe both consider that data roaming demonstrates greater elasticity than voice (see Telefonica submission on Review of the Roaming Regulation, 2011, at p.17, and Hutchison submission, 11 February 2011, at p.7).

Figure 42 - Voice volumes and revenue per minute for voice calls received in Saudi Arabia (subset of MNOs, in US dollars)



Source: GCC network operator responses, WIK calculations.

373. In responses to the Consultation Document, numerous MNOs expressed doubts that the sharp decline in IMR calls received in Saudi Arabia is relevant to the price elasticity of demand (PED) for IMR services. The RWG has considered the matter carefully. The RWG agrees that the PED implied by these observations should not literally be assumed to be the PED of IMR calls received for the GCC region; moreover, the RWG acknowledges that the arrangement in Saudi Arabia served primarily as a means of bypassing charges for international calls. That does mean, however, that the phenomenon is irrelevant to a discussion of the PED of IMR in the GCC region. In reality, it serves instead not only to reinforce the fact that consumers react to a price change in IMR services, but also the fact that there are important cross substitution effects among a range of different inter-related services.

374. As previously noted, the consultation response of one large GCC MNO is generally consistent with the Hörnig results for Europe. The GCC MNO's analysis appears to demonstrate that the PED for IMR calls made is broadly consistent with the corresponding PEDs that have been calculated for Europe. Comparing the volume of calls made and the average retail price in AED before and after the regulation took effect, they estimate a PED of -0.20 for local calls, and a PED of -0.23 for calls home and to other GCC countries. They write that these "… high level results are in line with international benchmark results listed in the Consultation … Therefore, [we do not] see any reason to assume that the elasticity value in the GCC ... could be higher than other areas. … Indeed, the Consultation itself, in paragraph (282), has estimated the price elasticity of demand across the GCC area to be around -0.27 for voice roaming services."

375. Taking all of this into account, the RWG is of the view that the Hörnig estimates represent the best available estimate of the price elasticity of demand for various IMR services in the GCC region.

8.4 Impact of the current Regulation on societal welfare

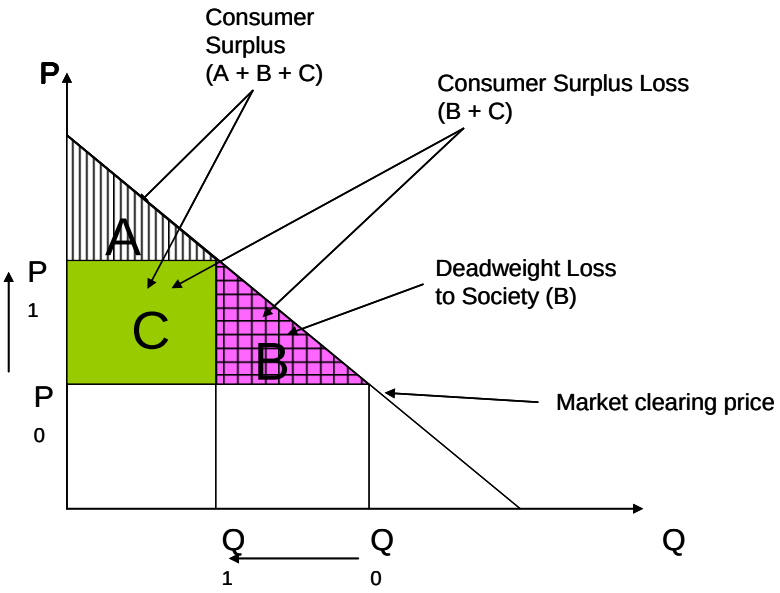
376. The information developed from the questionnaires is not sufficient to enable a rigorous determination of the benefits to societal welfare generated by the current Regulation; however, a rough estimate is possible.[84]

377. In understanding the benefits to consumers, it is helpful to review the basic economics, beginning with the Harberger Triangle (see Figure 43). In an ideal competitive market, prices would be set at the exact level where the supply and demand curves cross. In Figure 43, the line that slopes downward to the right is the consumer demand curve, while the supply curve (the horizontal line at P_0) is not critical to this discussion. The point identified as the 'market clearing price' is the expected and optimal pricing point in an ideal competitive market.

378. If prices are distorted, social welfare is reduced. Market power is such a distortion, which leads not only to higher prices, but also to lower consumption as a result. This is due to the *price elasticity of demand*, the tendency of consumers to increase (reduce) demand in response to a reduction (increase) in price.

379. If prices are set at the market-clearing point (P_0), the consumer surplus corresponds to the areas labelled A, B, and C in Figure 43. It is the entire area above the price charged, but below the demand curve. It can be thought of as the degree to which consumers would have been willing to pay more than they were required to pay (i.e. the surplus accruing to consumers at the market-clearing price).

Figure 43 - The Harberger triangle



Source: WIK

380. If a market distortion (for instance, last mile market power, or the call termination monopoly) artificially inflates the price charged, the price moves up from P_0 to P_1, while the quantity

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84 J. Scott Marcus, Ilsa Godlovitch, Pieter Nooren, Bram van den Ende, Jonathan Cave, and Dr. Werner Neu (2013), "How to Build a Ubiquitous EU Digital Society".

correspondingly contracts from Q_0 to Q_1. This reduces the consumer surplus (previously A+B+C) by the sum of the areas B+C. All that remains as consumer surplus is A.

381. Where the supply curve reflects increasing returns to scale, as is the case in most networks today, it is often ignored in the Harberger Triangle analysis (as we have done here).

382. This change entails two distinct effects. Area C represents a transfer of surplus (or welfare) from consumers to producers. To an economist, who tends to look at societal welfare in terms of the sum of consumer surplus and producer surplus, this transfer is in principle neutral – it is an allocative effect that neither adds to nor detracts from the overall welfare of society.[85]

383. However, area in triangle B is truly and unambiguously problematic. It represents consumption that should have taken place, but did not. It is referred to as a deadweight loss.

384. In this case, the key parameters for the GCC for the year 2012 (the first year after the Regulation took full effect) are known or can be estimated. The Oman TRA reports that prices for other-than-local calls after the full implementation of the regulation (Phase 2) were up to 59% lower than prior to regulation. The Bahrain TRA also reports substantial price reductions of up to 69% for local calls made and up to 49% for international calls made while roaming in any GCC member state. If one makes the conservative assumption that the Regulation resulted in an average reduction in retail roaming prices across the GCC of 40%, and also assume that retail roaming prices would not have declined at all in the absence of the Regulation (which is consistent with the limited pre-2012 information that MNOs provided through the survey), it is then reasonable to assume the following:

- 0.70 USD price per minute for calls originated in 2012 (with the Regulation)
- 206.6 million minutes of GCC roaming voice calls originated in 2012 (with the Regulation)
- 1.17 USD price per minute for calls originated in 2012 (absent regulation)
- 169.1 million minutes of GCC roaming voice calls originated (absent Regulation)
- - 0.27 price elasticity of demand for voice calls originated[86]

385. With these parameters, and under suitable assumptions, it is straightforward to demonstrate that the Regulation resulted in a transfer of welfare during 2012 from network operators to consumers of some 79.5 million USD, and a reduction in deadweight loss of 4.3 million USD.

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85 There may still be public policy implications, for instance as a matter of consumer protection, but welfare transfers are neutral in terms of overall economic welfare.

86 Stefan Hoernig (2011), in European Commission, “Commission Staff Working Paper: Impact Assessment Of Policy Options in Relation to the Commission's Review of the Functioning of Regulation (EC) No 544/2009 of The European Parliament and of the Council of 18 June 2009 on Roaming on Public Mobile Telephone Networks within the Community”. This is a European estimate, but it is probably not too far off for the GCC.

9 Selecting policies and practices for possible price controls

386. In this chapter, the RWG puts forward recommended regulatory and public policy interventions.

387. This discussion builds on the previous analysis. The overall characteristics of IMR in the region were discussed in Chapter 3. Specifics of markets in the region, based primarily on the survey of MNOs, appear in Chapter 4. Costs of IMR services in the region are estimated in Chapter 5. The implications of IMR for GCC public policy are explored in Chapter 6. Publicly policy objectives are discussed in Chapter 7. The effects of the current Regulation are reviewed in Chapter 8.

388. A key question is whether and how to achieve lower retail prices (which would be more reflective of actual costs) for IMR services in the GCC.

389. If explicit price controls (as already implemented in the present Regulation) were to be continued or extended, it would then be necessary to consider (1) which IMR services should be subject to price controls; (2) whether price controls are needed for retail versus wholesale services (or both); and (3) how best to enable MNOs to offer innovative retail pricing plans and bundles. This is, in fact, the policy that the RWG is recommending.

390. The remainder of this chapter goes on to consider issues, principles, and specific proposed wholesale and retail pricing levels for a regime of price caps. It includes (in Section 9.11) a rough estimate of the societal welfare gains that could be expected if the recommended wholesale and retail price controls are put in place.

9.1 Whether and how to achieve lower prices for international mobile roaming services

391. Among the overall goals identified in Section 7.5 is to achieve retail prices for IMR within the GCC region that are as low as feasible (subject to the constraint of allowing operators to recover the costs of supplying IMR services including a fair return on their investments (based on the post-tax WACC)).

392. In principle, GCC policymakers could seek to achieve this objective in any of a number of different ways, such as:

- **Taking no action**, with the hope or expectation either that IMR retail prices will decline in any case, or that effective substitutes will emerge.
- **Encourage MNOs to lower retail prices.**
- **Implement price controls** at retail and/or wholesale levels so as to mandate lower retail IMR prices.
- **Take steps to increase competition** in the IMR marketplace in the GCC as a means of fostering lower retail IMR prices.

393. The next sections of this chapter consider each of these in turn.

9.1.1 Taking no action

394. There are several plausible arguments for taking no further action at GCC level in regard to IMR. Possible rationales include:

- One might conclude that the current arrangements are fully satisfactory.

- One might believe that IMR prices will spontaneously decline due to market forces, increasing competition for IMR services, or for some other reason.
- One might believe that fully effective substitutes to IMR will soon emerge, rendering further intervention in the market unnecessary.

395. There is some tendency for IMR retail prices to decline on their own. This is visible in European statistics for IMR services that had not yet been regulated.[87]

396. All indications are that retail IMR prices nonetheless remain at levels that are quite high in relation to the underlying costs of providing the IMR service. It is for this reason that global concern with IMR has been great (see Section 7.1).

397. For the GCC region, there appears to be little evidence that the peculiar dynamics of the underlying roaming markets will resolve themselves through market forces alone, either at retail or wholesale level. Indeed, the limited data resulting from the survey of network operators suggests that, if anything, IMR prices in the region were more or less stable before the Regulation became fully effective in February 2012.

398. As concerns substitutes to the IMR service, they have always existed. As noted in Section 7.2, while each of these can be effective under suitable circumstances, none of the substitutes has provided an overall, comprehensive replacement for IMR, nor have such substitutes had a significant constraining effect on IMR prices.

399. Technology continues to evolve, so it is always possible that new substitutes might emerge. As a noteworthy example, when LTE roaming becomes available, the LTE local break-out capability might provide a useful complement to some IMR services (see Sections 9.1.4 and 10.4). Still, all things considered, it seems likely that the impact of substitutes for IMR services will continue to be limited.

9.1.2 Encouraging MNOs to lower prices

400. There are international precedents for governments engaging with operators to encourage lower international roaming prices. For example, the Russian government prepared a memorandum of understanding for signature by itself, its operators, and governments and operators from foreign countries who were willing to cooperate. Upon signing the memorandum, operators indicate their agreement that IOTs between Russia and the country concerned should be reduced, and commit to negotiating such reductions, without any specific price points in mind. Russia and its operators have signed such a memorandum with their Finnish counterparts. A similar agreement was put in place in 2011 between Russia and Poland.

401. The agreements have reportedly had no effect whatsoever on the price of IMR between Russia and either Poland or Finland.[88]

402. In theory, it might be possible to emulate the Russian approach but with added commitments to negotiate (unspecified) retail price reductions.

403. In practice, it is not anticipated that such arrangements would result in significant improvements in outcomes for GCC roamers. Indeed, they might lead to uneven treatment between MNOs of the

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87 BEREC (2014), „International Roaming: BEREC Benchmark Data Report, April 2013-September 2013, BoR (14) 16, March 2014, http://berec.europa.eu/eng/document_register/subject_matter/berec/reports/4246-international-roaming-berec-benchmark-data-report-april-2013-8211-september-2013. .

88 Tony Shortall (2013), International Mobile Roaming Agreements, OECD DSTI/ICCP/CISP(2012)2/FINAL, 3 June 2013.

region. There is little in the historical record to suggest that merely encouraging MNOs to lower prices would generate much in the way of benefits.

9.1.3 Implementing price controls

404. Controlling retail prices directly through a Regulation, with effect in all countries in a region, has been shown to be effective in the GCC region (and also in Europe since 2007). The effects of the current GCC Regulation are discussed in Chapter 8.2.

405. If implemented with due care, direct price controls do not appear to be particularly expensive to implement, and they do not appear to generate problems or dislocations.

406. Price controls are likely to have impacts, positive or negative, on four main groups:

- GCC roamers;
- GCC other users(non-roamers);
- GCC network operators (MNOs); and
- GCC Mobile Virtual Network Operators (MVNOs).

407. These impacts could vary depending on whether price controls are implemented only on retail, only on wholesale, or both. For reasons noted in Section 9.3, and in order to keep the discussion tractable, the assumption in this section is that price controls would be implemented both for wholesale and for retail services.

9.1.3.1 Impact on GCC roamers

408. Application of price controls would tend to benefit GCC roamers. Roamers would pay less for their communications while travelling. To the extent that price caps resulted in more competitive offerings for retail customers, private individuals would feel freer to remain in touch with friends and family. Similarly, businesses would find it that much easier to operate in other GCC member states and to gain pan-GCC scale.

409. The imposition of price controls is unlikely in and of itself to promote enhanced competition between operators. This is evidenced by the experience of the European Union, and also by the GCC's regulation of outgoing voice calls. In both cases, retail prices tended to cluster around the level of the retail caps that are in place, despite the existence of a healthy margin between wholesale and retail caps in which, theoretically, MNOs could create innovative retail offers.

9.1.3.2 Impact on other GCC end-users

410. Potentially, the imposition of price controls on IMR services could affect GCC end-users who do not use roaming services.

411. By way of explanation, assuming a price elasticity with an absolute magnitude of less than 1 (which is typical of IMR voice services, but not of IMR data (see Section 8.3)), price caps on additional roaming services would immediately reduce operators' roaming revenues. There is therefore potential for waterbed effects in separate markets (where a network operator attempts to compensate for a loss of revenue on one service by increasing prices on another), for example the retail market for domestic mobile services, or wholesale markets in which GCC operators sell services to operators from countries outside the GCC. For example, roaming prices for other destinations might rise (or more likely fall less than they otherwise might); or domestic prices might rise (or more likely fall less than they otherwise might).

412. In practice, any waterbed effect would likely affect prices in other roaming markets, rather than prices paid for domestic retail services, because there is less price elasticity, and less competition, in these other roaming markets than in the domestic markets.[89] As a related matter, in competitive markets in the GCC, an MNO that raises domestic prices risks losing market share.

413. Moreover, the extent of any waterbed effect is likely to be small. Intra-GCC roaming revenues represent only a small percentage of GCC operators' overall revenues, meaning that any loss of revenue from additional price caps is unlikely to be substantial (although the impact on profits is obviously greater).

9.1.3.3 Impact on GCC mobile network operators (MNOs)

414. As noted in Section 9.1.3.2, price caps on additional voice or SMS roaming services would tend to reduce operators' roaming revenues. For price controls on roaming data services, given their higher price elasticity of demand, one might possibly expect an increase in consumption sufficient to actually increase revenues.

415. However, roaming is not just a source of (retail and wholesale) revenue, but also a source of (wholesale) costs, in the form of payments to visited networks. This means that wholesale price reductions will be positive for some operators – specifically, for those that are "net outbound" (those whose wholesale payments made for the hosting of their outbound roamers in other GCC member states exceed the wholesale revenues they receive for hosting inbound GCC roamers[90]).

416. In sum, the impact on network operators is complex. On balance, one could expect a net loss of revenue for network operators, but this should be more than offset by gains on the consumer side, thus resulting in an overall welfare gain for the GCC region (see Section 8.4). As long as price caps are set so as to exceed real costs plus a proper return on MNO investments, MNOs should not be harmed, and investment incentives should not be adversely impacted.

417. It is nonetheless desirable to minimise "shocks" and to avoid needless impact on MNO revenues and profits. Price levels and glide paths should be established with this in mind.

9.1.3.4 Impact on MVNOs

418. Because MVNOs would be obliged, just like MNOs, to comply with retail price controls on IMR services, the application of retail price controls would affect MVNOs in much the same way as it would affect MNOs. Depending on price elasticity, there would likely be a reduction in revenues (at least in respect of voice and SMS), and a possibly larger reduction in profits.

419. Unlike MNOs, though, MVNOs would not benefit directly from the application of price controls on IOTs, since they have no direct relationship with visited networks and the wholesale prices that those visited networks charge. In theory, this could create a price squeeze.

420. However, it is usual business practice for MVNOs to simply resell their host network's retail IMR services, at a small discount on the host network's retail price to allow for the MVNO's retail costs. Assuming that retail price caps are applied to the host network's IMR services, the MVNOs' input costs will be reduced, and so MVNOs should be protected from the risk of price squeeze.[91]

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89 The tendency to take higher mark-ups where elasticity is lower is known as Ramsey-Boiteux pricing.
90 Typically, these are operators from countries that attract fewer tourists.
91 Some consultation responses suggest that the discount that MVNOs receive from MNOs may be insufficient to cover their costs. We note this concern; however, it is outside the scope of the current proceeding.

9.1.4 Increasing competition in the international mobile roaming marketplace

421. The IMR market has tended to a lack of effective competition worldwide. Demand side reasons include a lack of tariff transparency; a tendency for consumers to select their mobile service package based on considerations other than the price of IMR, resulting in low price elasticity of demand; and the lack of good, comprehensive substitute services. Supply side reasons include the natural oligopoly structure of the sector.[92] In addition, IMR appears to suffer from a structural tendency toward double marginalisation, where providers of two vertically related services (here the home network and the visited network) each take high mark-ups, leading to market arrangements that are inefficient overall. Somehow making IMR markets effectively competitive would have obvious benefits, but introducing competition has proven to be difficult, perhaps because IMR is subject to too many distinct market defects, each of which is resistant to change.

422. A number of attempts have been made or proposed to structurally alter the IMR market in the hopes of rendering price controls unnecessary. Two of these, *Alternative Roaming Provider (ARP)* and LBO were intended to come into effect in Europe in July 2014.[93] Each seeks to make it possible for network operators or MVNOs to offer IMR services directly to an MNO's customers.

423. In this context, LBO is a regulatory option. Its name is inspired by the technical capabilities of LTE mobile service of the same name that could in principle be used to implement the regulatory LBO option; however, the EU's LBO is not necessarily limited to the use of LTE.

424. Implementation costs for ARP and LBO in the EU are not rigorously known, but some stakeholders speak informally of implementation costs in the range of five to ten million euro per MNO per country.

425. As of today, neither of these mechanisms has been shown to be effective in lowering wholesale or retail prices for IMR services.[94] Only one company has announced plans to operate as an ARP,[95] and it is not expected to transform the IMR marketplace. Very little LBO service has deployed. Most experts consider both services to be stillborn.

426. The RWG is inclined to restrict any revision of the GCC roaming regulation to mechanisms that have greater prospects for success.

9.1.5 The assessment of the RWG

427. The RWG considers the use of price controls to be the most appropriate means of achieving IMR retail prices that do not unjustifiably exceed the real underlying costs of providing the IMR service. Potential principles and mechanisms are discussed in the remainder of this chapter.

9.2 Selecting the roaming services to which any price controls should apply

428. Price controls are already in place for calls made while roaming within the GCC. No price controls are in place for calls received, nor for SMS or roaming data.

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92 Ulrich Stumpf (2001), Prospects for Improving Competition in Mobile Roaming.
93 J. Scott Marcus, Pieter Nooren, and Imme Philbeck (2012), "State of the Art Mobile Internet Connectivity and its Impact on e-Commerce", PE 492.436, July 2012.
94 J. Scott Marcus, Ilsa Godlovitch et al. (2013), "How to Build a Ubiquitous EU Digital Society", PE 518.736, November 2013.
95 See http://www.cloud9mobile.co.uk/about/.

429. The arguments for and against extending wholesale and retail price controls to other roaming services are similar to those that apply to calls made. Reducing excessive pricing should result in an increase in use due to the price elasticity of demand. This reduces deadweight loss, and enhances the integration of the GCC region.

430. There is some degree of substitutability among the various IMR services. A roaming consumer may choose to send an SMS rather than incur the less predictable price of originating a call while roaming. A consumer who expects to pay less for receiving a call while roaming than for placing a call may call a friend or colleague and ask to be called back, or may simply dial the number and then hang up before the connection is made. It is for this reason that it can be appropriate to compute the price elasticity of demand jointly for the IMR services (see Section 8.3).

431. These substitutability effects suggest that there could be benefit in subjecting all of the common IMR services to a coordinated price control regime. If prices for some services are intentionally brought down while others remain high, there would be a tendency for consumer usage patterns to be distorted in favour of individual services that are available at low prices.

432. We consider the relevance of price controls to IMR calls made (Section 9.2.1), calls received (Section 9.2.2), SMS sent (Section 9.2.3), and roaming data (Section 9.2.4). We do not discuss charges of SMS received, because these are free today, and the RWG expects (and also insists) that they will remain so.

9.2.1 Calls made while roaming

433. Continuation of price controls on calls made while roaming would preserve the socio-economic benefits of the existing regulation.

434. The regulation can be assumed to have lowered wholesale and retail prices, and thus to have generated some increase in the number of voice calls made relative to the level that otherwise would have been present. This increase in consumption results in a reduction in deadweight loss (see Section 8.4 for the estimated benefits of the current Regulation), a transfer of welfare from network operators to consumers of roaming services, and an increase in social and economic cohesion in the region (see Section 7.3).

435. This option would impose no significant additional implementation costs on network operators, since these measures are already in place.

9.2.2 Calls received while roaming

436. The wholesale and retail price of voice calls originated is regulated in the GCC, but not the price of voice calls received. There are arguments for and against controlling the price of voice calls received.

437. The arguments in favour of price controls are similar to those for calls made (see Section 9.2.1). Extending price controls to calls received while roaming expands the scope of the socio-economic benefits and reductions in deadweight loss provided by reductions of price to levels more consistent with real cost.

438. There are reasonable counter-arguments that must be considered. Mobile operators appear to have a tendency to set the price per minute of roaming calls received at roughly half the price per minute of calls made; thus, it could perhaps be argued that regulation of the price of calls received is unnecessary.

439. In most of the world, there is no wholesale charge payable by the Home Network to the Visited Network (other than the payment of a Mobile Termination Rate (MTR)) for roaming calls received;

however, some Home Networks in the GCC region make wholesale payments to Visited Networks (primarily or solely in Kuwait) for calls received by their roamers. If retail regulation were imposed without ensuring that these wholesale payments do not increase, there would be a risk that price movements might result in controlled retail prices that are less than the costs of certain MNOs on certain routes. There is therefore a strong argument that, if retail prices are to be controlled for calls received, then these wholesale payments should also be limited.

440. Indeed, if price controls are implemented for calls received, Kuwait likely requires special handling. For calls received while roaming, the difference between the MTR received by the Home Network and the MTR paid by the Home Network is crucial to profitability. Due to the unique circumstance of the international gateway in use in Kuwait, MNOs in Kuwait generally pay some 0.35 USD per minute for outgoing international calls(including for calls received that the Kuwaiti Home Network forwards to the relevant Visited Network), and receive no MTR fees at all for incoming international calls. This means that a Home Network in Kuwait in effect experiences a much higher cost per minute for calls received by its outbound roamers than a Home Network in any of the other GCC member states.

441. In the view of the RWG, there are strong arguments in favour of imposing price regulation for calls received while roaming in order to generate economic benefits, to maintain the coherence of the overall roaming regulatory system (particularly considering that calls made and calls received likely function to some degree as substitutes for one another), and to avoid possible misalignment among prices. The RWG is therefore of the view that retail price controls should be implemented for calls received.

9.2.3 SMS sent while roaming

442. The benefits of potential price controls for SMS made while roaming in the GCC are similar to those for calls made (see Section 9.2.1). Extending price controls to SMS made while roaming expands the scope of the socio-economic benefits and reductions in deadweight loss provided by reductions of price to levels more consistent with real cost.

443. Implementing price controls for SMS also enhances the coherence of the overall regulatory approach, and reduces the risk of dislocations to the extent that SMS serves as a substitute for calls made or received (as, for instance, when a consumer sends an SMS with a predictable price in preference to placing a call where the price is more difficult to predict).

444. The volumes of SMS made while roaming in the GCC are declining (see Section 4.4.1), presumably due to substitution by OTT services. Many stakeholders argued that price controls are less crucial for a service that is in decline in any case.

445. On balance, the RWG is of the view that wholesale and retail price controls should be implemented for SMS made while roaming in the GCC, primarily in order to maintain the overall coherence and consistency of the IMR regulatory system. The usage of SMS may be declining, but it is still substantial.

9.2.4 Roaming data

446. The arguments in favour of imposing controls on roaming data at both wholesale and retail levels would appear to be strong. Data usage while roaming in the GCC is rapidly growing (see Section 4.4.1), and mobile data is clearly the service of the future.

447. Furthermore, the price elasticity of demand for roaming data has been found to be high (see Section 8.3), which is to say that there is a strong tendency for lower prices to result in increased

usage. This means that the benefits of downward pressure on retail prices for roaming data would tend to be far greater than those already achieved by regulating only the price of voice calls made while roaming in the GCC.

448. The benefits of potential price controls for data used while roaming in the GCC are similar to those for calls made (see Section 9.2.1). Extending price controls to data used while roaming expands the scope of the socio-economic benefits and reductions in deadweight loss provided by reductions of price to levels more consistent with real cost.

449. Implementing price controls for roaming data also enhances the coherence of the overall regulatory approach, and reduces the risk of dislocations to the extent that data services represent a substitute for calls made or received or for SMS (as, for instance, when a consumer sends a message with the WhatsApp application instead of sending an SMS).

450. On balance, the RWG is of the view that wholesale and retail price controls should be implemented for data roaming in the GCC.

9.2.5 MMS and of video calls made while roaming

451. The MNOs reported that the volumes of MMS and video calls are small. The RWG is of the view that regulation is not warranted at this time; however, further study might be required if usage of MMS and/or video calls were to change over time.

9.2.6 The assessment of the RWG

452. On balance, it is most appropriate to apply price controls to IMR calls made, calls received, SMS sent, and roaming data. This maximizes socio-economic benefits, as well as benefits to economic integration and social cohesion in the GCC region.

453. Applying a common price control regime to all four services minimizes the risk of any dislocations or distortions between and among the services.

454. It is also likely to be easier for consumers to understand than a fragmented regime where some IMR services are available at regulated price, while others are not.

455. The implementation costs are unlikely to be significant. Similar arrangements are already in place in Europe, and have not proven to be problematic.

9.3 Should price controls be implemented for retail services, wholesale services, or both?

456. In principle, price controls could be applied at wholesale level, at retail level, or both.

457. The objective for policymakers, as explained in Section 7.3, is to lower IMR retail prices to a level that is more reflective of the underlying costs of supplying roaming services. One could therefore consider a regime where only retail prices were controlled provided that wholesale charges are aligned with underlying costs including fair returns on capital.

458. The concern with such a regime is that wholesale prices are a cost to the home network. If (uncontrolled) wholesale prices were to increase for any reason, home network operators might find that their roaming operations were no longer profitable (at least in certain countries). There are two reasons why this must be avoided. The first is that it is unfair to the network operators. The second is that it potentially risks having roaming services no longer offered, or no longer

offered between all pairs of GCC member states. That would clearly be antithetical to the regional integration and social cohesion that were identified as proposed goals (see Chapter 6).

459. In a competitive market, one would expect that reducing prices at the wholesale level only should also result in the cost reductions being passed on to consumers in the form of lower retail prices. Thus, one could consider applying price controls solely at wholesale level.

460. A key concern, however, is that the price reductions at wholesale level would probably not be fully passed through to consumers. Retail IMR is not a market that enjoys effective competition – indeed, the lack of effective competition for retail IMR services is one of the main reasons why price controls need to be considered.

461. Indeed, data roaming in Europe was price controlled at the wholesale level from 2009 to 2012, but not at retail level. Retail prices declined, but remained greatly in excess in wholesale charges and also greatly in excess of domestic prices for mobile data. Cost reductions did not translate fully into retail price reductions. It is for these reasons that the European Union implemented retail price controls for roaming data in 2012.

462. On any given route, one of two network operators that enable roaming between their respective countries will tend to be a net receiver of wholesale payments, and the other a net payer. Price controls at wholesale level, if not reflected in changes in retail price, would shift the profitability of both network operators without generating benefits for consumers or for the GCC region as a whole.

463. For these reasons, it is the tentative assessment of the RWG that a coordinated regime of price controls at both wholesale and retail levels is to be preferred.

9.4 Identifying the degree of retail pricing flexibility required

464. Calls made to other GCC member states while roaming within the GCC are subject to wholesale and retail price regulation today. Retail prices are capped, but MNOs have the possibility of offering alternative retail pricing packages subject to the approval of their respective national authorities.

465. On general economic principles, there is a strong argument to be made that the network operators are in a better position than regulators or governments to develop retail pricing plans for consumers.

466. European experience demonstrates that, where both regulated and unregulated IMR plans are available, the unregulated plans are not necessarily a bargain for the consumer. The network operator often earns more with the unregulated plan than with the regulated plan.[96] Whether this is a market defect is a matter of opinion. Many would argue that if a knowledgeable consumer wishes to pay a little extra in order to be sure that his or her IMR usage for the day will not exceed some specified total price, that certainty (a form of insurance) can be a rational choice.

467. The overall assessment of the RWG is that network operators should be permitted to offer alternative roaming tariffs that might under some circumstances generate returns greater than the regulated rate; however, they should not be permitted to offer commercial roaming packages where, under reasonable assumptions as to the price to impute to the roaming service, the package would generate a higher price than the regulated rate even if all roaming minutes, SMS, and data MB in the bundle were fully utilised. National authorities may require MNOs to notify them

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96 BEREC (2014), „International Roaming: BEREC Benchmark Data Report, April 2013-September 2013, BoR (14) 16, March 2014, http://berec.europa.eu/eng/document_register/subject_matter/berec/reports/4246-international-roaming-berec-benchmark-data-report-april-2013-8211-september-2013.

in advance of proposed commercial roaming packages in order to ensure that these conditions are met.

468. National authorities will need to play a role going forward (1) to ensure (either ex ante or ex post) that roaming plans are not offered that exceed the regulated price even if the bundle is fully utilised; (2) that consumers are aware of regulated prices, and are not forced to take alternative plans unless they consciously choose them; and (3) that consumers are fully and fairly informed.

9.5 Selecting the appropriate principles for setting price levels

469. A number of price-setting principles can be put forward based on the discussion up to this point, assuming that price controls are to be implemented both at wholesale and at retail levels (see Section 9.3):

- Retail price caps for roaming within the GCC should be set at levels that are as low as feasible (see Section 7.3) consistent with being reflective of costs and still allowing a reasonably efficient MNO to achieve a reasonable return on their investments. The rationale for low prices reflects multiple industrial policy and regulatory concerns:
  - The need for increased economic integration (with corresponding societal scale economies) and social cohesion within the GCC region; and
  - Promotion of greater use of services, with corresponding reduction of deadweight loss.
- Retail and wholesale price controls should be set such that wholesale prices (which represent a cost to the home network operator), together with other IMR overhead costs and other relevant costs, are consistent with a fair return on MNO investments to a reasonably efficient network operator. Given that retail overhead is assumed to be 20% of the cost of providing the retail service (see Section 5.1), this implies that retail prices should be at least some 25-30% higher than wholesale prices. For the IMR service to become unprofitable between any pair of GCC member states would be unfair to the network operators involved, and would potentially risk having roaming services no longer offered between all pairs of GCC member states.
- It is not necessary for wholesale or retail prices to achieve the ultimate target levels in a single adjustment. Wholesale and retail controlled IMR prices could instead move gradually downward over time (see Section 9.6), always taking care to ensure alignment between wholesale and retail prices. The use of a glide path facilitates the ability of network operators to adjust their business plans to reflect revenue shifts.
- Through judicious setting of price levels and the glide path, it is possible (under realistic assumptions) and desirable to keep MNO revenues and profits roughly at current levels.
- Further downward adjustments may be appropriate as networks become more efficient over time.

9.6 A glide path for wholesale and retail price controls

470. It is in principle possible either to put an ideal set of target wholesale and retail prices into effect in a single step on a specific date, or to establish a predictable glide path to target wholesale and retail prices.

471. The glide path has several potential benefits:

- Any negative revenue impact on network operators is spread over a longer period of time, thus giving them greater opportunity to adjust.
- Network operators can gauge the response of their customers to the changes, and can tailor retail plans appropriately (see also Section 9.4).
- GCC authorities would be able to make mid-course corrections if any dislocations are identified in earlier phases.

472. In the consultation, most stakeholders argued for the use of a glide path.

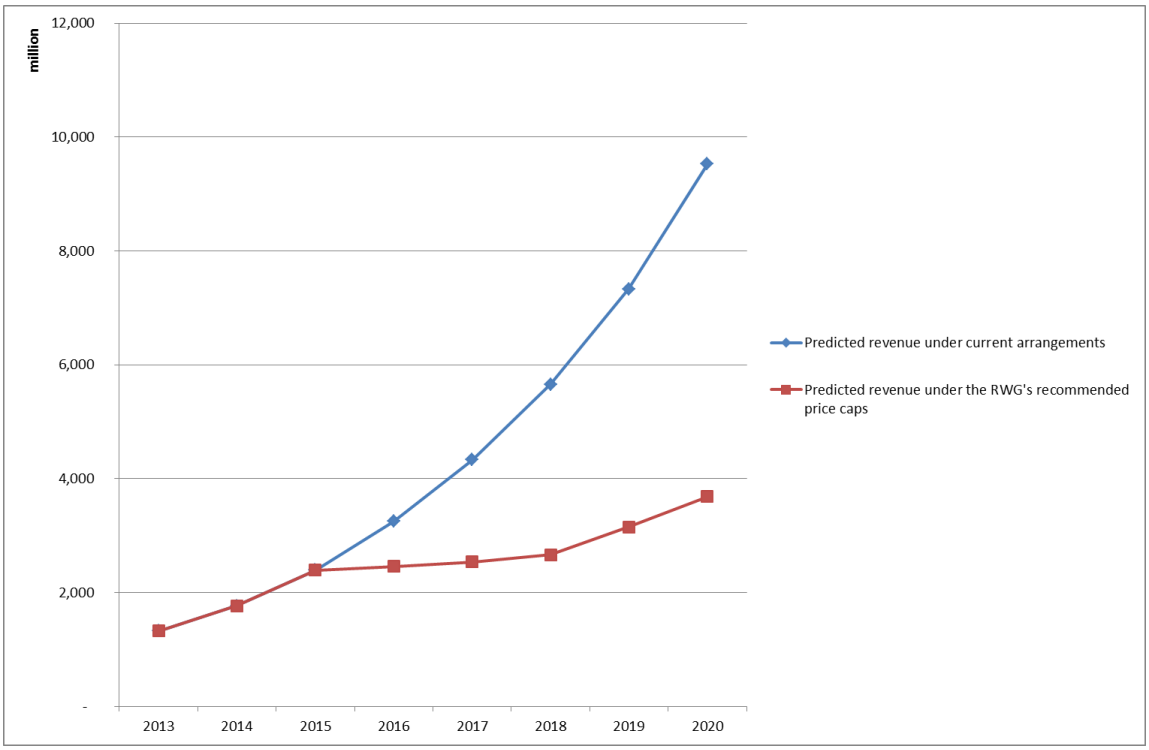
473. Network operators have noted that not all network operators reduced their wholesale prices when the current regulation was first introduced. That meant that some network operators in the GCC region were already obliged to lower their retail prices before they had the corresponding benefit of lower wholesale costs. The RWG agrees that this needs to be avoided. One possible approach would be to stagger the implementation of wholesale and retail price caps such that the retail price caps come into force a few months later than the wholesale caps, thus enabling GCC region national authorities to ensure proper and timely implementation at the wholesale level first. The alternative would be to simply use the regulatory tools available to GCC authorities to ensure timely and effective implementation of the wholesale remedies.

474. The RWG recommends implementation of IMR price controls for voice calls made, voice calls received, and SMS in three steps in 2016, 2017 and 2018; for data, however, the RWG recommends five steps in 2016, 2017, 2018, 2019, and 2020 (see *Table 8*, *Table 9*, *Table 10*, and *Table 11*). In each case, wholesale controls would come into effect on 1 January, while the corresponding retail controls would come into effect on the following 1 April.

475. Any measures taken should consider both consumer welfare and MNO welfare, since both contribute to societal welfare. It is important to avoid abrupt “shocks” and needless disruption to MNO revenues and profits.

476. No one can predict the future with perfect confidence; however, the RWG has sought to use the level and glide path of regulated roaming data prices as a “control knob” to enable a smooth, gradual transition, with as little disruption as possible to the MNOs. Through the careful tailoring of these control knobs, it is possible (under the evolution of consumer and business demand for roaming data services that the RWG considers to be most likely) to ensure that MNO IMR revenues remain in excess of 2015 levels (see *Figure 44*). The expected growth of mobile data services in general is the economic “engine” that makes this possible.

Figure 44. Expected evolution of total GCC MNO revenues if no action is taken versus under the RWG's recommended price caps (millions of USD).



9.7 Price levels for calls made while roaming

477. Calls made to other GCC member states while roaming within the GCC are subject to wholesale and retail price regulation today. Wholesale prices are capped. Calls placed to the visited country are capped at lower wholesale and retail rates than calls to the other GCC member states.

478. The RWG is of the view that price controls should remain in effect. Wholesale and retail prices caps should gradually float downwards (see Sections 9.5 and 9.6), thus providing a glide path toward greater cohesion and efficiency for the GCC Region. The RWG is also of the view that care must be taken to ensure that retail price caps remain in excess of wholesale costs, and that wholesale price caps remain in excess of underlying cost (see Section 7.5).

479. Under the current Regulation, price caps are specified in terms of Special Drawing Rights (SDRs). In this Final Report, the RWG has expressed price caps (and other statistics) in US dollars, since US dollars are widely used and understood in the region and many of the currencies in the GCC region are tied to the US dollar (see Section 8.1). Acknowledging the preference that most MNOs expressed in their responses to the Consultation Document, however, the RWG recommends that the final regulation implemented by the Ministers be formulated in terms of SDRs, using the exchange rate between USD / SDR exchange rate in effect as of some specified date.

480. As discussed in Section 8.1, the current regulated caps at the wholesale level are:

- 0.50 USD per minute for calls to GCC member states;
- 0.21 USD per minute for calls made within the visited GCC member state.

481. The permitted wholesale price level should exceed underlying costs. The RWG estimates the underlying costs to be some 0.41 USD for calls placed from Kuwait either to the home member state or a GCC member states other than the Kuwait; or up to 0.23 USD for calls placed from a

member state other than Kuwait either to the home member state or to a GCC member state other than the visited Country; or some 0.14 USD for calls made within the visited GCC member state (see Section 5.2.1). These costs will be less in member states where tax rates are lower.

482. There are substantial differences in cost among the member states due to (1) taxation, and (2) the charges imposed by the international gateway in Kuwait. The RWG has chosen to recommend price caps that reflect the situation in high cost member states, so as to have prices that are as consistent as possible across the region, even though this means that prices are set somewhat higher than would be feasible in low cost member states.

483. The RWG recommends that the wholesale price cap for calls to GCC member states other than the visited country should fall from 0.50 USD to 0.43 USD in three stages beginning on January 1 of 2016, 2017, and 2018. It would then exceed underlying costs (including all taxes) in all GCC member states, even after taking into account charges for the international gateway in Kuwait (under the conservative assumption that costs remain constant). In most member states, this will enable MNOs to earn a return well in excess of the after-tax *Weighted Average Cost of Capital (WACC)* that is used in many of the member states.**97**

484. Based on previous proceedings in high tax GCC member states, the RWG considers 13% to represent a reasonable estimate of the after-tax WACC for an efficient MNO in a high tax GCC member state.**98** (For an explanation of how the RWG has dealt with taxes in assessing costs, see Chapter 5.)

485. Consistent with the principles expressed in Section 9.5, retail price caps should be set at least 30% to 35% above wholesale price caps in order to ensure that the home network operator can make a reasonable after-tax return on the service, particularly when retail overheads of some 20% (see Section 5.1) are taken into account.

486. Based on the foregoing considerations, the RWG recommends the schedule of price caps shown in Table 8 going forward.

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97 The WACC is one measure of an appropriate level of profitability for a regulated service. We make these statements about the level of the WACC in the GCC without prejudice to any other policy or regulatory proceeding that might take place in the GCC or its member states.

98 See for instance UAE TRA (2012), “Etisalat’s Regulated Weighted Average Cost of Capital”, Determination no. (2) 2012, 1 July 2012.

Table 8 - Recommended price caps for calls made while roaming (USD per minute)

Within the Visited Country							
	Today	As of 1 January 2016	As of 1 April 2016	As of 1 January 2017	As of 1 April 2017	As of 1 January 2018	As of 1 April 2018
Wholesale cap	$ 0.21	$ 0.19		$ 0.18		$ 0.17	
Retail cap	$ 0.28		$ 0.26		$ 0.25		$ 0.24
Retail/wholesale mark-up	33%		37%		39%		41%
To other GCC Member States							
	Today	As of 1 January 2016	As of 1 April 2016	As of 1 January 2017	As of 1 April 2017	As of 1 January 2018	As of 1 April 2018
Wholesale cap	$ 0.50	$ 0.47		$ 0.45		$ 0.43	
Retail cap	$ 0.66		$ 0.64		$ 0.62		$ 0.60
Retail/wholesale mark-up	32%		36%		38%		40%

9.8 Price levels for calls received while roaming

487. At present, calls received while roaming are not subject to GCC price caps. The RWG is recommending that retail price controls be imposed.

488. The discussion in this section deals first with retail arrangements, then with wholesale arrangements (where the GCC differs significantly from other regions of the world).

489. Any retail price caps must enable a reasonably efficient network operator to cover its average costs and to make a reasonable financial return. The estimated average cost per minute to the Home Network for calls received while roaming within the GCC (with the exception of Kuwait, where charges imposed by the international gateway play a decisive role), including 20% retail overhead, can be assumed to be 0.14 USD going forward (see Section 5.1.2).

490. An unusual feature of this estimate is that the call termination cost is viewed in terms of the *net payment*. The home network typically receives an MTR from the caller's network (or retail revenue if the call is on-net), and pays an international MTR to the visited network (or may alternatively incur the cost itself if the visited network is part of the same carrier group). The MTR received will often, but not always, be a domestic MTR. The generously estimated cost of 0.16 USD assumes an average net cost (i.e. the international MTR of 0.10 USD paid minus the MTR received) of 0.06 USD.

491. In Kuwait, instead of an international MTR, the Home Network makes a payment to the international gateway of 0.35 USD per minute (with a billing increment of six seconds). The Home Network may receive a domestic MTR or retail revenue if the call is on-net, but does not receive an international MTR. Taking all of this into account, we estimate the average cost per minute to a Home Network in Kuwait for calls received while roaming within the GCC, including 20% retail overhead, to be some 0.40 USD (see Section 5.1.2).

492. In light of the much higher costs incurred by Kuwaiti MNOs for calls received by their roamers within the GCC, the RWG considers it necessary to permit Kuwaiti Home Networks to impose higher retail charges for calls received than MNOs in other GCC member states.

493. Based on the foregoing considerations, the RWG proposes the schedule of price caps shown in Table 9 going forward. With a generous estimate of total costs per minute of 0.40 USD in Kuwait and 0.14 USD in other GCC member states, this yields a reasonable net profit to the home network.

494. Retail price caps on calls received have been in use in Europe since 2007. The level of the retail price cap in the EU under the current Regulation will be 0.07 USD on 1 January 2016, which is much less than the level recommended by the RWG. There is little risk of unexpected consequences. Implementation costs are unlikely to be significant.

495. Wholesale IOT charges for calls received while roaming are not capped in other jurisdictions because they do not exist. The only wholesale charge imposed by the Visited Network for calls received while roaming is an international MTR.

496. Based on the RWG's survey data and Consultation Document responses, some GCC MNOs pay wholesale charges (in addition to paying an MTR to the Visited Network) to Kuwaiti Visited Networks. It seems clear that these wholesale charges should not be permitted to increase above current levels, which apparently do not exceed 0.04 USD per minute in Kuwait.

Table 9 – Recommended price caps for calls received while roaming (per minute)

Calls received	As of 1 April 2016	As of 1 April 2017	As of 1 April 2018
Retail cap (other than Kuwait)	$ 0.35	$ 0.28	$ 0.22
Retail cap (Kuwait)	$ 0.66	$ 0.60	$ 0.55
Markup versus cost (other than Kuwait)	147%	97%	55%
Markup versus cost (Kuwait)	67%	52%	39%

9.9 Price levels for SMS made while roaming

497. An estimate of 0.01 USD for the costs to the visited network for sending an SMS while roaming appears in Section 5.2.3. This includes origination costs, signalling costs, international transit, and roaming overheads. This is the total cost.

498. An estimate of the signalling costs and roaming overhead costs to the home network for sending an SMS while roaming appears in Section 5.1.3. The total cost to the home network is much greater today than it would be going forward, however, because the home network must make a substantial wholesale payment (referred to as an IOT) to the visited network. In addition, retail overhead is relevant.

499. Wholesale price controls for SMS could be set at very low levels, perhaps as low as 0.02 USD. The RWG proposes instead to set the wholesale price cap at 0.04 USD (see *Table 10*), partly as a means of reducing the likelihood of the counter-intuitive result that roaming SMS might become cheaper than domestic SMS.

500. For the retail price, the RWG proposes the levels shown in Table 10. Taking into account signalling costs, roaming overheads costs, and the wholesale payment made, this still leaves very generous margins for the home network operator.

501. There are no charges today for SMS received while roaming in the GCC. The RWG expects and insists that this will continue to be the case.

502. Wholesale and retail price caps on SMS have been in use in Europe since 2009. There is little risk of unexpected consequences. The regulation has been shown to be effective. Implementation costs are unlikely to be significant.

Table 10 - Recommended price caps for each SMS made while roaming

SMS	As of 1 January 2016	As of 1 April 2016	As of 1 January 2017	As of 1 April 2017	As of 1 January 2018	As of 1 April 2018
Wholesale cap	$ 0.04		$ 0.04		$ 0.04	
Retail cap		$ 0.08		$ 0.07		$ 0.06
Retail/wholesale mark-up		100%		75%		50%

9.10 Price levels for data sent or received while roaming

503. The estimated costs to the visited GCC network of 0.13 USD per megabyte (MB) of data for sending or receiving data while roaming in the GCC appear in Section 5.2.4. This includes data traffic costs, international transit, signalling costs, roaming overheads, and taxes.

504. The estimated costs to the home GCC network of 7.16 USD per megabyte (MB) of data for sending or receiving data while roaming in the GCC appear in Section 5.1.4. The majority of this cost is the wholesale payment to the visited network, which appears (based on data from the survey conducted by the RWG) to have averaged 4.95 USD/MB in 2012.[99] In addition, retail overhead and taxes are relevant.

505. Any measures taken should consider both consumer welfare and MNO welfare, since both contribute to societal welfare. It is important to avoid abrupt "shocks" and needless disruption to MNO revenues and profits. With this in mind, the RWG has sought to use the level and glide path of regulated roaming data prices as a "control knob" to enable a smooth, gradual transition, with as little disruption as possible to the MNOs (see Section 9.6). Through the careful tailoring of these control knobs, it is possible (under the evolution of consumer and business demand for roaming data services that the RWG considers to be most likely) to ensure that MNO IMR revenues remain in excess of 2015 levels. The expected growth of mobile data services in general is the economic "engine" that makes this possible.

506. The RWG recommends implementation of IMR data roaming price controls five steps in 2016, 2017, 2018, 2019, and 2020 (see *Table 11*). In each case, wholesale controls would come into effect on 1 January, while the corresponding retail controls would come into effect on the following 1 April.

507. The GCC RWG proposes to set the wholesale price cap at 0.80 USD as of 1 January 2016, declining to 0.50 USD on 1 January 2017, and 0.35. 0.30, and 0.25 USD on 1 January 2018, 2019, and 2020, respectively (see *Table 11*). This still represents a substantial mark-up over today's actual cost. In reality, given the rate at which costs are declining in the sector, the actual margin is likely to be much greater going forward.

508. For retail price, the GCC RWG proposes the levels shown in *Table 11*. Compared to current costs, wholesale charges would be greatly reduced by price controls, and the allocations for retail overhead and taxes would also be based on a much lower level of revenue. Taking into account all costs, this still leaves a generous mark-up for the home network operator.

509. Regulation would presumably be effective. Costs of implementation are not likely to be significant.

510. The view of the RWG is that wholesale and retail price regulation of roaming data at the prices shown in *Table 11* is reasonable.

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99 This wholesale price obviously bears little relation to the underlying cost.

Table 11 - Recommended price caps for roaming data (per Megabyte)

	As of 1 January 2016	As of 1 April 2016	As of 1 January 2017	As of 1 April 2017	As of 1 January 2018	As of 1 April 2018	As of 1 January 2019	As of 1 April 2019	As of 1 January 2020	As of 1 April 2020
Wholesale cap	$ 0.80		$ 0.50		$ 0.35		$ 0.30		$ 0.25	
Retail cap		$ 1.30		$ 0.85		$ 0.60		$ 0.50		$ 0.42
Retail/wholesale mark-up		63%		70%		71%		67%		68%

9.11 Welfare analysis of recommended price controls

511. Following the same analysis as employed in Section 8.4, the RWG has estimated the welfare transfer from MNOs to consumers and the reduction in deadweight loss that would be engendered for each IMR service by the recommended wholesale and retail price controls (see Figure 46 and Figure 47).

512. The calculation is based on 2012 GCC survey results, and assumes that all other aspects are held constant (sometimes referred to as a *ceteris paribus* assumption). This assumption is a crude approximation, since circumstances obviously change over time – for instance, data traffic increases, and not solely in response to changes in price.

513. Demand elasticity is based on well-respected work done by the economist Stefan Hörnig (see Sections 8.3 and 8.4).[100] In Consultation Document responses, a number of MNOs expressed doubts about the applicability of European demand elasticity estimates to the GCC region; however, one GCC MNO provided their own estimate of the price elasticity of demand for calls made, based on their own data, demonstrating a price elasticity of demand in a GCC member state that lines up very closely with the Hörnig estimate.

514. For calls made, the benefits are incremental to those of the existing roaming Regulation (which were already covered in Section 8.4).

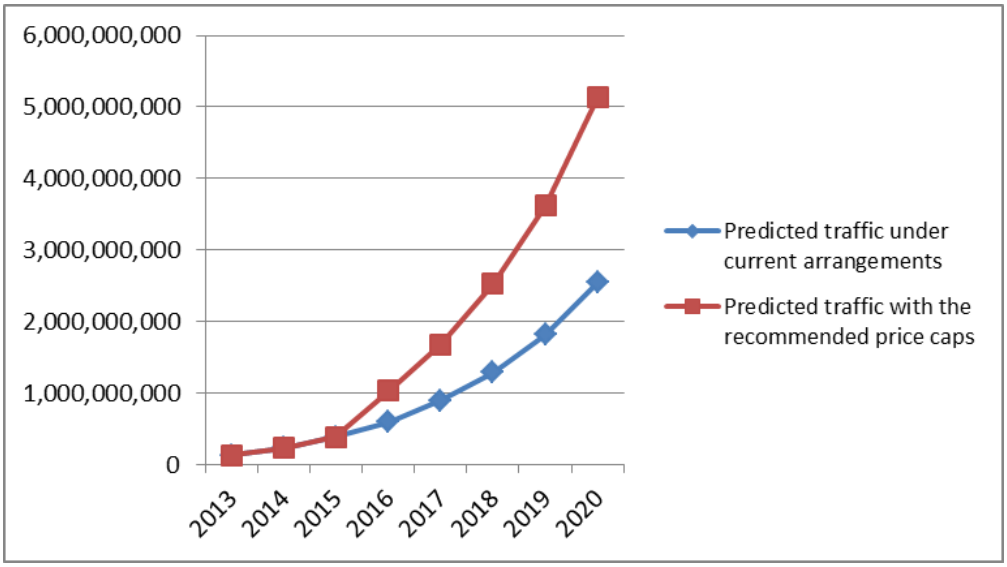
515. Societal welfare is generally viewed as being comprised of the sum of consumer welfare and producer welfare (where in this case the MNOs are the producers of the service). GCC society as a whole benefits from the reduction in deadweight loss, and presumably also from enhanced regional cohesion and integration (see Section 7.3.1) and from various other spill-over effects into the broader economy. Consumers benefit not only from the reduction in deadweight loss, but also from the welfare transfer (of excessive profits) from producers to consumers.

100 European Commission (2011), Commission Staff Working Paper: Impact Assessment of Policy Options in Relation to the Commission's Review of the Functioning of Regulation (EC) No 544/2009 of the European Parliament and of the Council of 18 June 2009 on Roaming on Public Mobile Telephone Networks within the Community.

516. The benefits that flow from price regulation of IMR data services greatly exceed those generated by price controls for other IMR services.[101]

517. The RWG's recommended approach represents a very large cut to mobile data prices. The expected increase in traffic volume as a result (under the most likely assumptions) is dramatic (see *Figure 45*). This increased usage can be expected to generate direct economic benefits. In addition, it can be expected to generate "spill over" effects into business in the region, and to contribute to enhanced economic and social cohesion

Figure 45. Expected growth in the annual use of roaming data services due to the use of the RWG's recommended approach (MB).



518. It is straightforward to estimate the impacts on societal welfare using the Harberger's triangle method (see Section 8.4). Figure 46 shows the relative role of calls made, calls received, SMS and data to the total welfare transfer from producers to consumers; these effects, however, do not necessarily enhance societal welfare). Figure 47 shows the corresponding and important gains to societal welfare (through reduction in deadweight loss).

519. These gains grow in annual magnitude as the years go by, thanks to growth in IMR data traffic volumes. By 2020, estimated annual gains to societal welfare are some 2.5 billion USD, while estimated cumulative gains to societal welfare will have been 6.7 billion USD.

520. These numbers are quite substantial; nonetheless, the more compelling reason to proceed with further reform of international mobile roaming in the GCC region is (presumably as one of several measures) to promote the further socioeconomic integration and cohesion of the GCC region.

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101 Demand elasticity influences deadweight loss (but not welfare transfer). The demand elasticity of -1.23 assumed for IMR data services is much higher than that of IMR voice or IMR SMS; however, it does not introduce a risk of very large errors. It is reasonable to assume that IMR data demand is elastic, and thus at least -1.00. If demand elasticity were -1.00 instead of -1.23, reduction in deadweight loss would be $192,145,454 instead of $236,338,908.

Figure 46. Welfare transfer from providers to consumers under the RWG's recommended price caps compared to those under current arrangements (millions of USD).

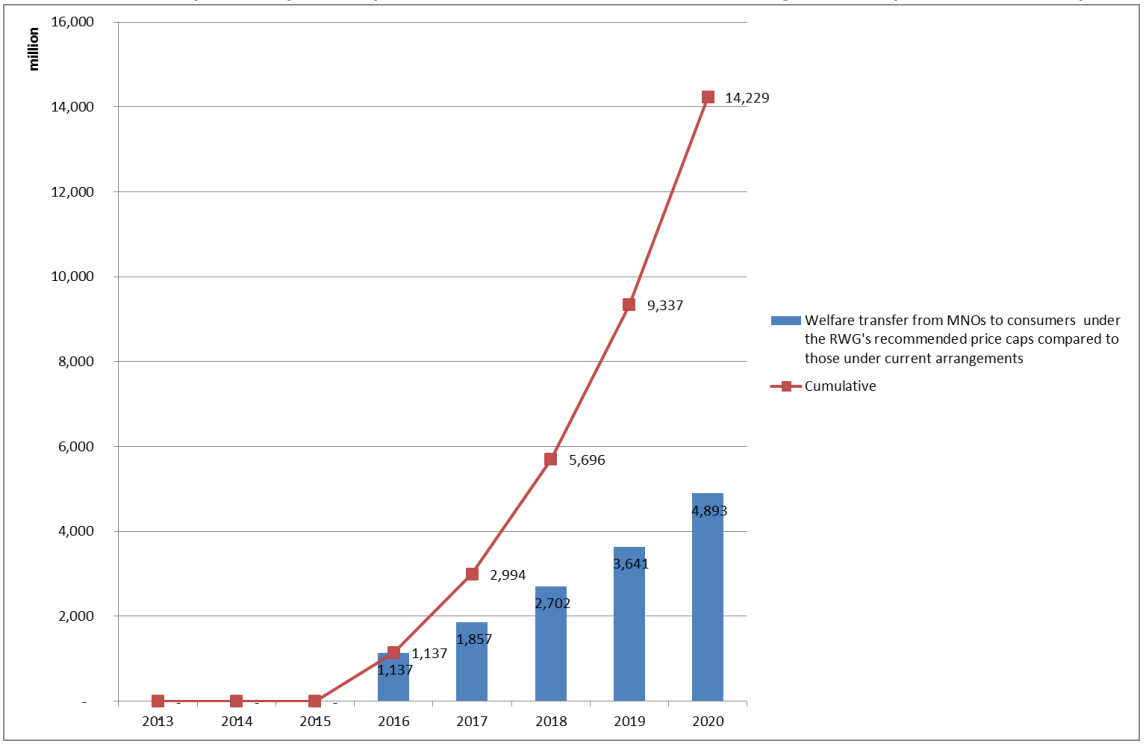
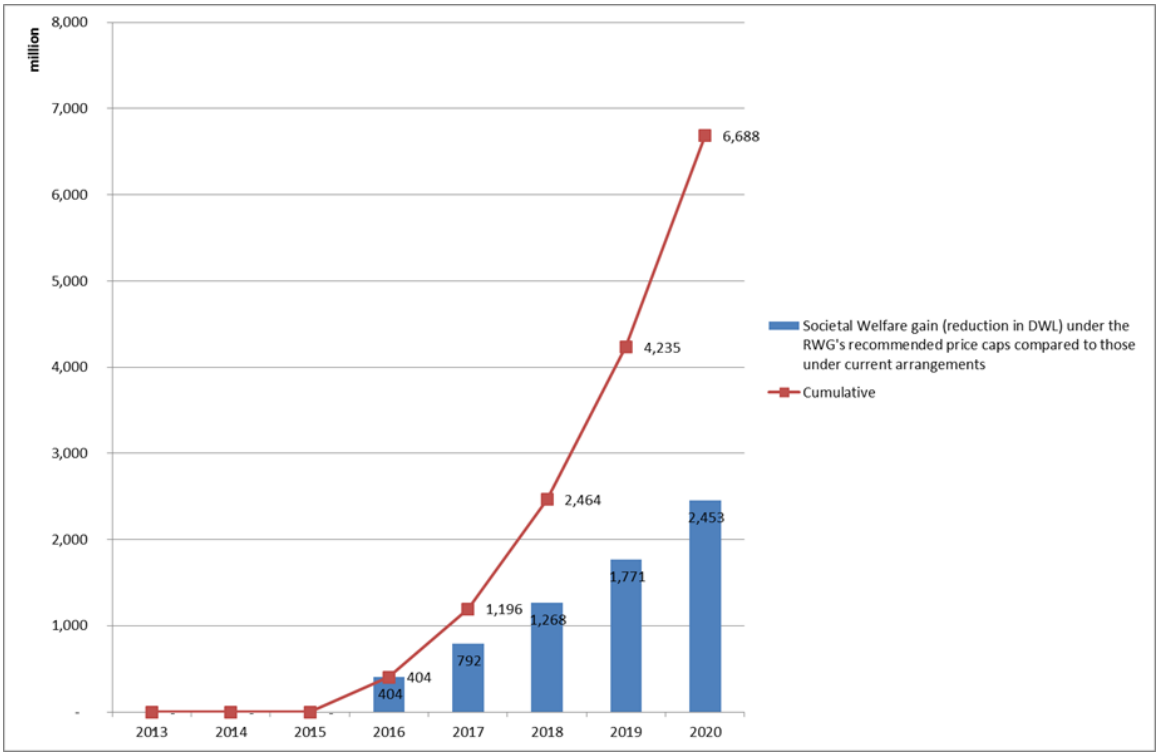


Figure 47. Gain in societal welfare (reduction in deadweight loss) under the RWG's recommended price caps compared to those under current arrangements (millions of USD).



9.12 Concerns that wholesale IOT rates could be forced to levels that are too low

521. Some stakeholders have argued, in light of the large disparities in size and bargaining power among the MNOs in the GCC region, that smaller MNOs are sometimes forced to accept wholesale payments that do not cover their costs. They therefore argue that wholesale prices should be subject not only to a price ceiling, but also to a price floor.

522. The net impact of a price floor is difficult to assess. It might possibly be positive for competition in the GCC region, which would be beneficial; on the other hand, it might lead to higher wholesale and retail prices for roaming in the GCC region than would otherwise be strictly necessary, which would tend to be detrimental.

523. Mandating symmetrical IOTs might provide an alternative or additional way to address the same concerns. With symmetric IOTs, large MNOs with strong bargaining power would not be able to force smaller MNOs to accept lower IOTs than they themselves are willing to accept. The MNOs would still be free to set the level of IOTs through negotiation, subject to any floors or ceilings that would be set by the new roaming Regulation.

524. The case for an intervention at this time seems to be weak. Stakeholder feedback to these proposals was mixed (largely as a function of whether an MNO perceived itself to be advantaged or disadvantaged), and the effects of any intervention are difficult to predict. Small net-receiver MNOs may be earning less than they would like, but it seems unlikely that they are being forced to accept levels of payment that do not cover their costs. The RWG will continue to monitor this area, but we do not recommendation any specific actions at this time.

9.13 The effect of taxes and other charges imposed by member state governments

525. As noted throughout this chapter, tax rates throughout the region vary significantly. In order to enable MNOs to achieve a fair return on their investments, it is necessary to set any price caps at levels that take these taxes into account.

526. Taxes are generally applied both to wholesale and to retail revenues; consequently, their effect on roaming calls, SMS or data where both the Home Network and Visited Network are in high tax member states is effectively doubled.

527. In the interest of providing clarity to consumers, the RWG has chosen wherever possible to maintain consistent price caps across the region. This means, however, that returns to MNOs in low tax member states are much greater than in high tax member states. This arguably introduces economic distortions across the region. It also implies the need to set price caps for roaming at levels considerably higher than would otherwise be the case.

528. Analogously, the charges of roughly 0,35 USD imposed by the international gateway in Kuwait, together with the fact that international termination rates received by the international gateway in Kuwait are not flowed through to MNOs, implies the need to set price caps for roaming at levels considerably higher than would otherwise be the case. Moreover, it makes it impractical to set the same price for roaming calls received by Kuwaiti mobile subscribers at the same level as roaming calls received by other mobile subscribers.

529. All of these issues are beyond the remit of the RWG, but we encourage the Ministers to consider whether other approaches might be possible – for instance, limiting taxes so that they apply only to retail charges, not to wholesale IOT revenues, so as to tax once rather than twice.

10 Supporting measures

530. Chapter 9 discussed the principles and practice for the possible implementation of (additional) price controls for IMR services in the GCC region. This section discusses a range of supporting measures that should be considered.

531. Some of the measures reflect regulatory best practice, such as the collection of statistics, and periodic review of the effectiveness of the Regulation. Several separable, complementary additional candidate policy interventions were evaluated, but no specific action is recommended at this time.

10.1 Collection of statistics

532. The RWG is strongly of the view that a comprehensive framework for data collection is called for going forward. The data collected needs to capture key indicators not only on all regulated services, but also on services that might be candidates for future regulation. It is possible, based on the results of this consultation, that some services that the RWG tentatively proposes to regulate will not in fact be regulated in the GCC in the coming years. Systematic data collection is nonetheless needed in order to inform future policy decisions.

533. The data collection conducted in support of the consultation has demonstrated that both time and experience are required to develop a solid, reliable quantitative understanding of roaming in the GCC region. It is necessary to build a base of experience, both for the government bodies collecting the statistics and for the network operators providing the data. This strongly suggests that data collection, instead of being episodic, needs to be done on a regular basis.

534. If promptly initiated, a systematic periodic data collection could provide:

- A baseline of measurements going forward;
- The ability to estimate the effects and effectiveness of the Regulation, and of any further changes in regulation;
- A solid estimate of the demand elasticity of each roaming service;
- A sound basis for assessing regulatory needs going forward.

535. In Europe, *BEREC* has a well-developed process for roaming statistics collection that has been in operation since 2006.[102] BEREC's work in this regard can be viewed as representing global best practice. BEREC has kindly made their spreadsheet templates available to the RWG (see Annex B). The RWG is of the view that is in the GCC's interest to draw on BEREC's process, making adaptations where necessary to fit regional circumstances, for several reasons:

- The GCC avoids the costs of developing its own mechanisms.
- The GCC profits from a mature BEREC process. The lengthy learning curve is bypassed.
- There is a substantial base of experience, both among regulators and among MNOs, in how to fill in the BEREC statistics templates. This helps avoid initial errors.
- Using processes that are as close to identical as possible facilitates cross-comparison of the publicly available data, to the substantial mutual benefit of both regions.

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102 See its latest report BEREC (2014), „International Roaming: BEREC Benchmark Data Report, April 2013-September 2013, BoR (14) 16, March 2014, http://berec.europa.eu/eng/document_register/subject_matter/berec/reports/4246-international-roaming-berec-benchmark-data-report-april-2013-8211-september-2013.

536. A number of consultation responses expressed concerns that the data collection might be burdensome; given, however, the nearly universal interest among stakeholders in proper and comprehensive assessment of the impacts of any measures that are taken, the RWG is of the view that a data collection along these lines is indispensable.

537. The RWG envisions a process where each GCC member state regulatory authority or ministry would collect data from the MNOs in its respective country, and then the national authorities would submit their information to the GCC Statistics Office by an agreed-on date every six months. The GCC Statistics Office would then produce a consolidated public GCC roaming report of aggregate statistics at intervals of six months. Detailed MNO information is understood to be commercially sensitive, and will be kept in confidence.

538. A sample questionnaire, based on BEREC's design but adapted to GCC circumstances in minor ways, was presented as an annex to the consultation document. No substantial comments were received on the format of the questionnaire.

539. The RWG will monitor the effectiveness of the questionnaire in practice, and will coordinate its ongoing evolution in the GCC member states. It is likely that adaptations to the questionnaire will be needed once there is practical experience with the process.

540. Based on the data about Termination Rates, especially Mobile Termination Rates (MTRs), that came to light in the course of the consultation process, it has become clear that systematic monitoring of Termination Rates is also needed if a full understanding of IMR in the GCC region is to be achieved. We consider it likely that the GCC will initiate monitoring of TRs through a separate work stream; should that for whatever reason not eventuate, however, then monitoring of TRs should be considered as part of the GCC data collection for IMR.

10.2 Billing increment

541. In the GCC region, most voice services are priced per minute and rounded up to the next greatest minute, both for domestic voice and for roaming voice. Wholesale payments, however, are almost always computed on a per-second basis. This mismatch effectively results in a surcharge to the retail price.

542. In Europe, the 2009 Roaming Regulation required that IMR voice services under the default regulated pricing plan (the *EuroTariff*) be priced on a per-second basis. Rounding up to the next greatest minute was no longer permitted (except for the first 30 seconds of the voice call).

543. In the course of the consultation process, nearly all stakeholders argued that moving to per-second billing would be inappropriately burdensome.

544. After due consideration, the RWG has decided to recommend no action on per-second billing at this time. We are leaving room for operators to introduce such innovative changes on a commercial basis, as a form of product differentiation; however, the RWG considers it appropriate to recommend maximum billing units: per minute for voice, and per MB for data offers based on volume of usage.

10.3 Measures to reduce bill shock

545. All GCC member states have implemented messages to inform GCC consumers of the cost of IMR services when they enter another GCC member state. These information messages are distinct from the GCC Regulation, and therefore are not addressed in this document.

546. Despite these informational messages, relevant authorities in the GCC member states continue to receive complaints about the high IMR retail prices (especially for IMR data services). Stories concerning “bill shock” continue to appear in the press in the GCC region (see Section 7.4).

547. It is a concern for both regulators and network operators when a consumer receives an unexpectedly large bill for roaming. In Europe, this has been successfully mitigated by implementing warning messages to the consumer (typically by means of an SMS) when his or her usage approaches a threshold, and cutting off service when the threshold is exceeded unless the consumer signals a desire to continue. Oman already has such a system in place.

548. The initial cost of implementing these protections for pre-paid customers was said to be roughly the same as the cost of implementing for post-paid customers, according to some European MNOs. Some have argued that it is not necessary to protect pre-paid customers, since the limited balance on their account protects them anyway. These arguments might suggest that protection for pre-paid customers is unnecessary; a counter-argument could be that the costs of developing OSS software changes have already been borne by European MNOs, and that the software is now available to the MNOs in the GCC at reasonable cost.

549. In the course of the public consultation, most MNOs indicated that they had already taken significant steps to reduce the risk of bill shock, that they continue to make improvements, and that they would support reasonable measures to further reduce the risk of bill shock.

550. The RWG recognises the voluntary efforts that a number of GCC region MNOs have already undertaken to reduce bill shock.

551. The RWG is of the view that thresholds similar to those in Europe should be put in place in the GCC region in order to further protect consumers from the risk of an unpleasant “bill shock” when roaming. Consumers should be warned before they exceed a previously specified or agreed level of IMR charges for the month.

552. The RWG expects all operators to implement some sort of threshold system for IMR voice, SMS, and data within one year of the publication of the new Regulation. The RWG will at that stage assess whether any obligatory system should be imposed.

10.4 LTE Local Breakout

553. The use of the LTE technical capabilities to enable Local Breakout (which avoids the need for roaming data to be carried back to the home network) potentially avoids needless IMR cost.[103] The RWG therefore encourages MNOs to consider whether the use of LTE Local Breakout might be of value for their IMR operations.

554. Implementation of IMR services in an LTE environment raises numerous new technical issues.

555. Purely technical matters involving transmission systems and associated Operational Support Systems (OSS) can presumably be left to the network operators.

556. No specific policy interventions were identified in the public consultation process; however, the evolution of LTE-based services is understood to be important to the region. GCC RWG therefore recommends that policymakers in the region continue to track the evolution of LTE services in the GCC region to ensure that they evolve as they should.

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103 The reference here is to an LTE technical capability, which should not be confused with the regulatory Local Breakout obligation that has been introduced in the European Union.

10.5 Periodic review

557. As with any intrusive regulatory intervention measure, the continued effectiveness and efficiency of the GCC roaming Regulation should be reassessed from time to time to ensure that the implementation continues to be effective, and that the needs that it seeks to address are still relevant. By 31 December 2018, the RWG will decide whether reasonable grounds exist to commence a review of the roaming regulation. In the interim, the RWG will monitor data collected from operators (see Section 10.1).

11 Glossary and list of abbreviations

558. These definitions are taken from “Trans-Tasman roaming”, a report of the New Zealand Ministry of Business, Innovation and Employment (MBIE) and the Australian Department of Broadband, Communications and the Digital Economy (DBCDE), February 2013. Where appropriate, they have been adapted and supplemented to suit the GCC region.

Term	Abbreviation	Definition
Alternative Roaming Provider	ARP	Under the European Roaming Regulation of 2012, an alternative provider of IMR services in one or more countries, offering a competitive alternative to the home network. (Source: WIK-Consult)
Arab Regulators Network of telecommunications and information technologies	AREGNET	AREGNET was established in mid-2003 in Algeria to share expertise, know-how, and success stories among Arab countries, discuss possible regulatory challenges, and attempt to harmonise Arab telecom regulatory frameworks whenever possible
Bill Shock	-	"Bill shock" refers to the negative reaction a subscriber has to receiving a high and unexpected request for payment from his/her company. (Source: Ypsilanti (2013), ITU)
Body of European Regulators of Electronic Communications	BEREC	An association of the national (electronic communications) regulatory authorities of the EU countries.
Business Support Systems	BSS	Business Support Systems are operational support systems (OSS) that are used by telecommunications providers to support the management of all their business processes. (Source: WIK-Consult)
Customised Applications for Mobile networks Enhanced Logic	CAMEL	CAMEL is a set of standards designed to enable an MNO to define services over and above standard GSM and UMTS services. CAMEL can be used to provide real-time visibility into call charges. (Source: Wikipedia / WIK-Consult)
Deadweight loss	-	The decrease in supply as a result of the exercise of market power creates an economic deadweight loss which is often viewed as socially undesirable. See also Harberger triangle. (Source: WIK-Consult)
GSM Association (Groupe Speciale Mobile Association)	GSMA	Association of mobile operators and related companies devoted to supporting the standardising, deployment and promotion of the GSM mobile telephone system (Source: Wikipedia)

Term	Abbreviation	Definition
Harberger triangle	-	Harberger's triangle refers to the deadweight loss occurring in the trade of a good or service due to government intervention, that takes the shape of a (curvilinear) triangle in the graph involving the demand curve and supply curve, where two sides of the triangle are usually segments of the demand curve and the supply curve respectively, and the third side is a straight line representing the government intervention. See also deadweight loss. (Source: WIK-Consult)
Home Location Register	HLR	A computer database in a mobile network, that holds information about each of the network's subscribers, such as location and service restrictions. A mobile network will typically comprise only one HLR.
Home Network	HN	The mobile operator of which the roamer is a customer in their own country.
Information and communications technology	ICT	Term that stresses the role of unified communications1 and the integration of telecommunications (telephone lines and wireless signals), computers as well as necessary enterprise software, middleware, storage, and audio-visual systems, which enable users to access, store, transmit, and manipulate information. (Source: Wikipedia)
Inbound	-	When describing roamers, means roamers that a visited network hosts. When describing traffic or revenues, means traffic or revenues generated by those roamers for the visited network. See also 'outbound'.
International calls	-	In the context of the GCC roaming Regulation, calls made calls made to other GCC member states including the home country are international calls.
International Mobile Subscriber Identity	IMSI	A 15 digit-long number, comprising a country code (e.g. 966 for Saudi Arabia), a network code (e.g. 01 for STC) and a subscriber code (e.g.1234567890). A mobile operator checks the IMSI number of a SIM card to identify the subscriber and his or her details (e.g. account balance, roaming rights, and so on).
International Mobile Roaming	IMR	A service that allows users of mobile cellular devices to use those devices (and their associated numbers) while abroad to make and receive voice calls, to send and receive SMS and to upload and download data.
International Telecommunications Union	ITU	The ITU is the United Nations specialised agency for information and communication technologies.
Inter-Operator Tariff	IOT	The wholesale rate charged by a VN to a HN for handling the HN roamer's outgoing voice calls, outgoing SMS, and outgoing or incoming data. In this document, we follow common practice in including wholesale payments obtained under Preferred Roaming Arrangements. See also MSRN.
Local calls	-	In the context of the GCC roaming Regulation, calls made within the visited country are local calls.

Term	Abbreviation	Definition
Local Break-Out	LBO	A technology which routes a roamer's communications through the VN, rather than hubbing them back to the HN (as is the case for traditional roaming services, except outgoing voice calls). LBO is particularly associated with LTE, into which it is integrated.
Long Term Evolution	LTE	A mobile cellular technology allowing greatly enhanced speeds and reduced latency, and commonly (though incorrectly) referred to as fourth generation or '4G'.
Mobile Local Access	MLA	An MLA solution is one that offers mobile cellular access to a roamer, as if they were a local user (as opposed to, say, nomadic access through Wi-Fi sites). An MLA solution may be comprehensive, offering access to voice, SMS and data services, or partial, offering access to e.g. data services only.
Multimedia Messaging Service	MMS	MMS provides a standard way to send messages that include multimedia content to and from mobile phones. It can be viewed as an extension to the core SMS (Short Message Service) capability.
Mobile Network Operator	MNO	Provider of wireless communications services that owns or controls all the elements necessary to sell and deliver services to an end user including radio spectrum allocation, wireless network infrastructure, back haul infrastructure, billing, customer care, provisioning computer systems and marketing and repair organizations. (Source: Wikipedia)
Mobile Subscriber Integrated Services Digital Network	MS-ISDN	A mobile network operator assigns an MS-ISDN number to each of the network's SIM cards. It is a unique contact number up to 15 digits long, comprising a country code (e.g. 966 for Saudi Arabia), a destination network code (e.g. 01 for STC) and a subscriber code (e.g.1234567 for John Doe). In short, it is the SIM card's phone number.
Mobile Station Roaming Number	MSRN	A temporary number assigned to a roamer in the visited destination. The expression 'MSRN termination fee' describes the wholesale rate charged by a VN to a HN for handling the HN roamer's incoming voice calls. See also IOT.
Organisation for Economic Cooperation and Development	OECD	An international organisation of 34 countries founded in 1961 to stimulate economic progress and world trade. (Source: Wikipedia)
Over-the-top	OTT	Refers to the delivery of content (video, audio and other media) over the Internet without a network operator being involved in the distribution of the content.
Outbound	-	When describing roamers, means roamers that a home network services. When describing traffic or revenues, means traffic or revenues generated by those roamers for the home network. See also 'inbound'.
Plastic roaming	-	Plastic roaming occurs when an end user who would otherwise be roaming acquires and uses a SIM card from a mobile network operator in the visited country in order to obtain mobile services at domestic prices.

Term	Abbreviation	Definition
Price elasticity of demand	-	Price elasticity of demand is a measure used in economics to show the responsiveness, or elasticity, of the quantity demanded of a good or service to a change in its price. (Source: WIK-Consult)
Retail rates	-	IMR retail rates are the prices that the home operator charges their subscribers for IMR services. (Source: ITU Recommendation D.98)
Roaming Working Group	RWG	The group includes members from each body responsible for telecommunications regulation in the Gulf Cooperation Council (GCC) countries (Source: http://www.zawya.com/story/TRA_Hosts_the_9th_Meeting_of_the_GCC_Mobile_Roaming_Working_Group-ZAWYA20140218091902/)
Second Generation for mobile communications	2G	Generic name for second generation mobile communication networks, for example GSM. (Source: ITU)
Subscriber Identification Module	SIM	An integrated circuit stored on a removable plastic card that is used to identify and authenticate the mobile subscriber and to store information and identifiers for the subscriber. (Source: WIK-Consult)
Single IMSI multi MS-ISDN	SIMM	A SIMM solution is one that assigns more than one MS-ISDN to a single IMSI. An inbound SIMM solution targets inbound roamers. An outbound SIMM solution targets outbound roamers.
Short Message Service	SMS	SMS is a text messaging service component of phone, Web, or mobile communication systems. (Source: Wikipedia)
Transferred Account Procedure	TAP	A TAP file contains information about the calls made by a roamer, and is sent by the visited network to the home network.
Termination rates		Termination rates are the charges which one fixed or mobile telecommunications operator charges to another for terminating calls on its network. (Source: WIK-Consult)
Third generation for mobile communi-cations	3 G	Generic name for third-generation networks or services that comply with the International Mobile Telecommunications-2000 (IMT-2000) specifications, for example UMTS and W-CDMA. (Source: ITU)
Three and a half generation for mobile communi-cations	3.5 G	Generic name for mobile networks upgraded from 3G, to HSDPA, HSUPA and CDMA-EVDO standards with the objective to providing higher bit rates than the previous standards.

Term	Abbreviation	Definition
Two and a half generation for mobile communi-cations	2.5 G	2.5 G refers to mobile communication networks systems that are based on packet-switched technology in addition to the circuit-switched technology (e.g. GPRS General Pack Radio Service).
Visited Network	VN	The mobile operator on which the roamer is hosted in the visited destination.
Visitor Location Register	VLR	A computer database in a mobile network that holds information about subscribers currently in its coverage area. A mobile network will typically comprise a number of VLRs.
Weighted Average Cost of Capital	WACC	The WACC is the return on capital invested in a firm which appropriately compensates the providers of capital (equity and debt) for both the time value of money and the underlying risk of the business. It is frequently used by regulators as a measure of the permissible profit for a regulated entity. (Source: RWG)
Wholesale rates		IMR wholesale rates are the prices that the visited operator charges the home operator for allowing the home operator's subscriber to roam on the visited operator's network. They include IOTs and MSRN termination rates. (Source: ITU Recommendation D.98)

Annex: Example Questionnaire for IMR data collection

B-1. An example questionnaire follows, to show how data is to be collected as proposed in Section 10.1. It is modeled after the questionnaire used by the Board of European Regulators of Electronic Communications (BEREC) for data collection in the European Union and European Economic Area (EEA). Minor adaptations are likely to be needed over time.

Section 1 - Subscriber information: please provide the following information as of Q2 2015

1.1	International roaming subscribers (000s subscribers)	Residential and Business, excluding special corporate		
		Prepaid	Postpaid	Special corporate
1.1.1	Number of enabled roaming subscribers	0.000	0.000	0.000
1.1.2	Total number of mobile subscribers (roaming + non-roaming)	0.000	0.000	0.000

Section 2 - Retail roaming (outbound) volume and revenue information - please provide the following information separately for the periods: Q1, Q2 2015

a) Retail Roaming Volumes - please provide to 3 decimal places

2.1	Retail Roaming Voice Minutes (millions of minutes) - (default tariff only) Q1 2015	Prepaid		Postpaid	
		calls made	calls received	calls made	calls received
2.1.1	Roaming calls to GCC countries other than the visited country (actual minutes)	0	0	0	0
2.1.2	Roaming calls to GCC countries other than the visited country (billed minutes)	0	0	0	0
2.1.3	Roaming calls to the visited country (actual minutes)	0	0	0	0
2.1.4	Roaming calls to the visited country (billed minutes)	0	0	0	0
2.1.5	Roaming calls to the rest of the world (actual minutes)	0	0	0	0
2.1.6	Roaming calls to the rest of the world (billed minutes)	0	0	0	0

	Retail Roaming Voice Minutes (millions of minutes) - (default tariff only) Q2 2015	Prepaid		Postpaid	
		calls made	calls received	calls made	calls received
2.1.7	Roaming calls to GCC countries other than the visited country (actual minutes)	0	0	0	0
2.1.8	Roaming calls to GCC countries other than the visited country (billed minutes)	0	0	0	0
2.1.9	Local calls within the visited network (actual minutes)	0	0	0	0
2.1.10	Roaming calls to the visited country (billed minutes)	0	0	0	0
2.1.11	Roaming calls to the rest of the world (actual minutes)	0	0	0	0
2.1.12	Roaming calls to the rest of the world (billed minutes)	0	0	0	0

	Retail Roaming Voice Minutes (millions of minutes) - (special tariffs) Q1 2015	Prepaid calls made	Prepaid calls received	Postpaid calls made	Postpaid calls received
2.1.13	Roaming calls to GCC countries other than the visited country (actual minutes)	0	0	0	0
2.1.14	Roaming calls to GCC countries other than the visited country (billed minutes)	0	0	0	0
2.1.15	Local calls within the visited network (actual minutes)	0	0	0	0
2.1.16	Roaming calls to the visited country (billed minutes)	0	0	0	0
2.1.17	Roaming calls to the rest of the world (actual minutes))	0	0	0	0
2.1.18	Roaming calls to the rest of the world (billed minutes)	0	0	0	0

	Retail Roaming Voice Minutes (millions of minutes) - (special tariffs) Q2 2015	Prepaid calls made	Prepaid calls received	Postpaid calls made	Postpaid calls received
2.1.19	Roaming calls to GCC countries other than the visited country (actual minutes)	0	0	0	0
2.1.20	Roaming calls to GCC countries other than the visited country (billed minutes)	0	0	0	0
2.1.21	Local calls within the visited network (actual minutes)	0	0	0	0
2.1.22	Roaming calls to the visited country (billed minutes)	0	0	0	0
2.1.23	Roaming calls to the rest of the world (actual minutes)	0	0	0	0
2.1.24	Roaming calls to the rest of the world (billed minutes))	0	0	0	0

2.2	Retail Roaming SMS Volumes (millions of messages) Q1 2015	Prepaid SMS	Postpaid SMS
2.2.1	Roaming SMS messages to the GCC (default tariff)	0	0
2.2.2	Roaming SMS messages to the GCC (special tariffs)	0	0
2.2.3	Roaming SMS messages to the rest of the world (special tariffs other than bundles)	0	0
2.2.4	Roaming SMS messages to the rest of the world (bundles)	0	0

2.3	Retail Data Volumes (millions MB) Q1 2015	Prepaid data	Postpaid data
2.3.1	Roaming data (default tariff)	0	0
2.3.2	Roaming data (special tariffs other than bundles)	0	0
2.3.3	Roaming data (bundles)	0	0

Retail Data Volumes (millions MB) Q2 2015	Prepaid data	Postpaid data

2.3.4	Roaming data (default tariff)	0	0
2.3.5	Roaming data (special tariffs other than bundles)	0	0
2.3.6	Roaming data (bundles)	0	0

b) Retail Roaming Revenues - please provide gross revenue excluding VAT, please provide to 3 decimal places

		Prepaid	Postpaid
2.4	Retail GCC global roaming revenues for bundles (voice/SMS/data) (000s USD) Q1 2015	0	0
2.5	Retail GCC global roaming revenues for bundles (voice/SMS/data) (000s USD) Q2 2015	0	0

		Prepaid		Postpaid	
2.7	Retail Roaming Voice Revenues (000s USD) – (default tariff only) Q1 2015	calls made	calls received	calls made	calls received
2.7.1	GCC Roaming voice revenues	0	0	0	0
	Local calls within the visited country revenues	0	0	0	0
	Calls back home or calls to another GCC country revenues	0	0	0	0

		Prepaid		Postpaid	
	Retail Roaming Voice Revenues (000s USD) - (default tariff only) Q2 2015	calls made	calls received	calls made	calls received
2.7.2	GCC Roaming voice revenues	0	0	0	0
	Local calls within the visited country revenues	0	0	0	0
	Calls back home or calls to another GCC country revenues	0	0	0	0

		Prepaid		Postpaid	
	Retail Roaming Voice Revenues (000s USD) – (special tariffs) Q1 2015	calls made	calls received	calls made	calls received
2.7.5	GCC Roaming voice revenues (excluding bundles)	0	0	0	0
2.7.6	Rest of World Roaming voice revenues	0	0	0	0

		Prepaid		Postpaid	
	Retail Roaming Voice Revenues (000s USD) - (special tariffs) Q2 2015	calls made	calls received	calls made	calls received
2.7.7	GCC Roaming voice revenues (excluding bundles)	0	0	0	0
2.7.8	Rest of World Roaming voice revenues	0	0	0	0

		Prepaid		Postpaid	
2.8	Retail Roaming SMS Revenues (000s USD) Q1 2015	Non GCC-SMS	GCC-SMS	Non GCC-SMS	GCC-SMS
2.8.1	GCC Roaming SMS revenues (excluding bundles)	0	0	0	0
2.8.2	Rest of World SMS revenues	0	0	0	0

		Prepaid		Postpaid	
	Retail Roaming SMS Revenues (000s USD) Q2 2015	**Non GCC-SMS**	**GCC-SMS**	**Non GCC-SMS**	**GCC-SMS**
2.8.3	GCC Roaming SMS revenues (excluding bundles)	0	0	0	0
2.8.4	Rest of World SMS revenues	0		0	

		Prepaid		Postpaid	
2.9	**Retail Roaming Data Revenues (000s USD) Q1 2015**	**Non GCC data**	**GCC-data**	**Non GCC data**	**GCC-data**
2.9.1	GCC Roaming data revenues (excluding bundles)	0	0	0	0
2.9.2	Rest of World Roaming data revenues	0		0	

		Prepaid		Postpaid	
	Retail Roaming Data Revenues (000s USD) Q2 2015	**Non GCC data**	**GCC-data**	**Non GCC data**	**GCC-data**
2.9.3	GCC Roaming data revenues (excluding bundles)	0	0	0	0
2.9.4	Rest of World Roaming data revenues	0		0	

Section 3 - Wholesale roaming (inbound) - please provide the following information separately for the periods: Q1 2013, 1 January-Q2 2013

Please provide Volume and Revenue information to 3 decimal places

		Non group volumes (millions)		Non group total revenues	Group volumes
3.1	**Wholesale Roaming Voice Minutes and Revenues (excl. VAT, incl. discounts) - Q1 2015**	**Actual Minutes**	**Billed minutes**	**(000s USD)**	**Actual minutes (millions)**
3.1.1	GCC Member States	0	0	0	0
3.1.2	Local calls within your country	0	0	0	0
3.1.3	Calls back home or calls to another GCC country	0	0	0	0

		Total traffic (Rest of World)	
		Billed minutes (millions)	**Total revenues (000s USD)**
3.1.4	Rest of World	0	0

		Non group volumes (millions)		Non group total revenues	Group volumes
	Wholesale Roaming Voice Minutes and Revenues (excl. VAT, incl. discounts) - Q2 2015	**Actual minutes**	**Billed minutes**	**(000s USD)**	**Actual minutes (millions)**
3.1.5	GCC Member States	0	0	0	0
	Local calls within your country	0	0	0	0
	Calls back home or calls to another GCC country	0	0	0	0

Total traffic (Rest of World)

		Billed minutes (millions)	Total revenues (000s USD)
3.1.6	Rest of World	0	0

		Non group volumes (millions)	Non group revenues (000s USD)	Group volumes (millions)
3.2	**Wholesale SMS - Q1 2015**			
3.2.1	GCC Member States	0	0	0

		Total traffic (Rest of World) Total volumes (millions)	Total revenues (000s USD)
3.2.2	Rest of World	0	0

		Non group volumes (millions)	Non group revenues (000s USD)	Group volumes (millions)
	Wholesale SMS - Q2 2015			
3.2.3	GCC Member States	0	0	0

		Total traffic (Rest of World) Total volumes (millions)	Total revenues (000s USD)
3.2.4	Rest of World	0	0

		Non group volumes (million MB)	Non group revenues (millions USD)	Group volumes (millions MB)
3.3	**Wholesale Data Services - Q1 2015**			
3.3.1	GCC Member States	0	0	0

		Total traffic (Rest of World) Total volumes (millions)	Total revenues (000s USD)
3.3.2	Rest of World	0	0

		Non group volumes (millions MB)	Non group revenues (millions USD)	Group volumes (millions MB)
	Wholesale Data Services - Q2 2015			
3.3.3	GCC Member States	0	0	0

		Total traffic (Rest of World) Total volumes (millions)	Total revenues (000s USD)

3.3.4	Rest of World	**0**	**0**