REGULATORY AND MARKET ENVIRONMENT

Regulatory analysis of international mobile ROAMING SERVICES

Report

Telecommunication Development Sector

Regulatory analysis of international mobile roaming services

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This report has been prepared for ITU by Mr Robert Clarke from Clarke Mosby Mehta (www.clarkemosby.com), under the direction of the Regulatory and Market Environment Division (RME), of the Telecommunication Development Bureau (BDT). This study has been developed based on desk research as well as using data from the ITU Tariff Policies Survey, ICTEye database (www.itu.int/icteye/). ITU would like to thank Mr Akilles Loudière formerly of the European Commission and Mr Jorge Infante, former Chairman of the Expert Group on International Roaming BEREC, for their support and valuable comments in the preparation of this report.

Please consider the environment before printing this report.

Foreword

On 23-24 September 2013 in Geneva, Switzerland, the International Telecommunication Union (ITU) hosted a high-level workshop on regulatory and economic aspects of international mobile roaming, which was convened to discuss the regulatory and industry initiatives that have sought to improve competitive outcomes for international roamers, as well as the ITU report *International mobile roaming services: Facilitating competition and protecting users*.

The workshop was enlightening. Through the presentations and discussions, it became clear that countries were adopting three main approaches: from the interventionist approach of the European Union and Gulf Cooperation Council, to the negotiating approach of the Portuguese-speaking community, and a "third way" adopted by New Zealand and Australia of harnessing the threat of regulation to provoke meaningful change amongst mobile operators.

The workshop participants worked hard towards the goal of lower roaming prices, and the call was made for better resources to be made available, including standard costing tools and methodologies to address the competition issues in this market. Against this background, in closing the event, the Deputy to the Director of the ITU Telecommunication Development Bureau (BDT) assured participants that ITU will respond to calls for increased international coordination in this area and continue its work on best practices and global standards for roaming.

It is in this context that ITU has commissioned the present report. It aims to provide governments, ministries and regulators with the information they need to make informed decisions about which approach to international roaming is the right one for them, and how to affect the approach chosen.

I trust that the findings of this report will serve as a guidance to assist the membership in designing their roaming strategy in order to improve competition in this market.

Brahima Sanou
Director
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1 Introduction

According to the ITU report on "International Mobile Roaming services: Facilitating competition and protecting users" it was noted that, "there is now general agreement that the price of international mobile roaming communication services is high and is well above cost".[1] This consensus was also noted in the Summary of the ITU High Level Workshop on International Mobile Roaming.[2]

Of course, within a country, competition between mobile operators may be fierce. As a result, consumers may have access to unmetered talking options, unlimited messaging offers, and even all-they-can-eat data plans.

As soon as consumers start to use a mobile device abroad (roam), they pay a premium for accessing their normal mobile services because by definition they become "international". Competition between operators seems to slow at the border, and prices rise.

Consumer concerns regarding high international roaming service prices have been discussed and deliberated in many forums and activities of ITU including the World Conference on International Telecommunications (WCIT) (Dubai, United Arab Emirates, 3-14 December 2012) where the International Telecommunication Regulations [3] were reviewed, the ITU-T Study Group 3 Works, the ITU-T Recommendation (D.98), the Global Symposium for Regulators (GSR)[4], and other workshops and capacity building activities.

ITU-T Recommendation D.98[5] on Charging in international mobile roaming service provides many tools for lowering international mobile roaming rates including those for empowering consumers, offering market based solutions and making regulatory interventions.

However, there have also been regulatory interventions as a direct result of analysis or investigation of international mobile roaming services. For governments and regulators that have decided to undertake such analysis or investigations, this report provides a methodology. It neither advocates nor recommends such measures and is simply meant to enhance the skills of individuals who are undertaking such tasks.

This report offers practical advice on investigating international mobile roaming services[6] and provides the context and information needed to do two things: first, to choose the approach to roaming; and second, to run the day-to-day investigation that will follow.

Newcomers to international roaming may find it useful to read the Annex to this report before continuing. It describes some of the fundamental concepts involved in international roaming.

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1 The report is available at: www.itu.int/en/ITU-D/Regulatory-Market/Pages/Studies.aspx. Supra, p.8

2 Summary available at: www.itu.int/en/ITU-D/Regulatory-Market/Pages/Events2013/GE_Roaming/home.aspx

3 See www.itu.int/en/wcit-12/Pages/itrs.aspx

4 See www.itu.int/en/ITU-D/Regulatory-Market/Pages/default.aspx

5 See www.itu.int/rec/T-REC-D.98-201209-I

6 Robert Clarke led the investigation into international mobile roaming between New Zealand and Australia, culminating in the announcement of a bilateral agreement between these two countries in 2013.

2 Unilateral, bilateral and multilateral approaches

Before getting started, there is a need to make some preliminary decisions that set up the general approach to be taken to the analysis of international roaming on a national level.

2.1 What body should lead the analysis?

The first issue to consider is which organisation should lead the analysis. Broadly speaking, there are three possibilities:

- An "ex post" competition regulator (such as, for instance, the Competition and Markets Authority in the United Kingdom) could undertake the analysis and take a decision. A possible outcome, if wrongdoing is found, would be a fine for offending operators, to punish them for anti-competitive behaviour they are found to have engaged in. Milder remedies are also possible.
- An "ex ante" sector-specific regulator (such as OFCOM in the United Kingdom) could lead the analysis. A likely outcome would be the imposition on operators of obligations that are available under the current regulatory framework (for example, in some countries, wholesale price caps) and which aim to prevent anti-competitive outcomes in the market.
- The ministry responsible for telecommunication matters could lead the analysis. A likely outcome would be legislative change, which opens up the possibility of a much wider array of obligations that could be imposed on operators, such as structural reform of the international roaming market.

It may not always be possible to "choose" which organisation will lead the analysis. For example, competition regulators and sector-specific regulators may have "triggers" for their involvement that are set out in legislation, which may or may not be met at any given time.

In this context, the real issue is often simply whether the government should step in and conduct an analysis before, or even after, a competition or sector-specific regulator has acted.

The Governments of New Zealand and Australia stepped in *before* their regulators acted. In 2011, they announced a full market investigation into roaming services between their two countries. This decision was in part due to the fact that, at the time, the (ex post and ex ante) New Zealand regulators did not have the ability to share information compulsorily acquired from New Zealand operators with foreign regulators, which would have severely hampered cooperation during any regulator-led investigation.

The European Union stepped in *after* both their ex post and ex ante regulators had acted.[7] In July 2006, it announced that it would regulate the price of roaming within the European Union. This decision was based on a perception that the existing regulatory framework had proven ineffective.[8]

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[7] The European Commission started investigations against UK and German operators under ex post competition law provisions: see press releases dated 26 July 2004 (http://europa.eu/rapid/press-release_IP-04-994_en.htm?locale=fr) and 10 February 2005 (http://europa.eu/rapid/press-release_IP-05-161_en.htm?locale=en). A number of national sector-specific regulators also undertook ex ante market analyses, but did not find that their threshold for intervention was met. This included regulators from Austria, Czech Republic, Denmark, Estonia, Finland, Greece, Ireland, Italy, Poland, Spain and Slovenia. The French regulator, ARCEP, concurred in its draft market analysis, but this draft was never finalized or notified to the European Commission.

[8] See, for example, the "Background" comments in a press release dated 12 July 2006, available at: http://europa.eu/rapid/press-release_IP-06-978_en.htm?locale=en

In the end, whether a government decides to step in and carry out an analysis will depend on a variety of factors. However, a government led analysis has several advantages:

- the threshold for intervention may be more flexible than it is for regulators;
- access to a wider palette of obligations; and
- a capacity to manage "most favoured nation" concerns at the same time.

However, it also has disadvantages:

- the potential to un-nerve investors, who prefer regulatory frameworks to remain stable; and
- governments may be more susceptible to regulatory error (e.g. imposing obligations that create more problems than they solve), given that they are less closely involved in market monitoring than regulatory authorities.

2.2 Acting unilaterally

In the interests of speed and simplicity, a country may wish to act alone, or "unilaterally". Possible actions range from light-handed to highly interventionist.

At a light-handed level, this approach might include measures aimed at enhancing consumer understanding of the price of roaming, for example requiring operators from a country to personalise the "welcome SMSs" their roamers receive on arrival abroad, in which the rates for the different roaming services are clearly displayed.

At a much more interventionist level, it would be possible for a country, acting alone, to adopt what are known as "structural measures". These measures alter the structure of the market, rather than constraining behaviour within the current market structure.

This might include following the lead of the European Union, by legislating to allow end-users to choose one operator for their domestic services, and a different operator for their roaming services. This is known as "decoupling" or "unbundling" roaming services. It is based on the premise that operators do not compete strongly on retail roaming prices because, while roaming and domestic services remain sold as a bundle, customers are unlikely to switch on the basis of roaming prices alone, which over a year are normally just a small part of the end-user bill. The theory is that, if roaming were unbundled and sold as a stand-alone service, the end-user would become much more responsive to roaming price changes, and operators would be forced to compete on price.

Singapore and Australia have both adopted unilateral measures at the light end of the scale. In March 2011, the Singapore regulator, IDA, announced that from February 2012 it would oblige operators in Singapore to implement a system whereby roamers could:

a. choose to deactivate data roaming entirely, or

b. choose to have data roaming automatically suspended once the roamer runs up a SGD 100 (≈USD 80) charge.[9]

In August 2012, the minister responsible for telecommunications in Australian issued a direction requiring the Australia regulator, the Australian Competition and Consumer Commission (ACCC), to prepare an "industry standard" requiring operators in Australia to, at a minimum, provide price information to their roamers on arrival at their destination, and permit roamers to "decline continued provision" of roaming services at any time during their travel.[10]

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[9] See IDA announcement: www.ida.gov.sg/News%20and%20Events/20110314122636.aspx?getPagetype=20

[10] On 23 August 2012, the Minister for Broadband, Communications and the Digital Economy, Stephen Conroy, signed the Australian Communications and Media Authority (International Mobile Roaming Industry Standard) Direction (No. 1) 2012.

No individual country has as yet adopted structural measures unilaterally, but there is no fundamental reason why one shouldn't consider it.[11] Of course there would be risks, for example:

a. If it adopted unbundling, operators would lose economies of scope by having to service two retail markets (domestic and roaming) rather than just one. This could create inefficiency costs that ultimately end-users (and not just roamers) would have to pay.

b. However, as noted above, decoupling is also likely to mean that the operators would compete more on retail pricing for roaming services.

It is worth noting that what might be considered a "mid-level" option – retail price caps – presents challenges for any country acting unilaterally.

One issue with unilateral capping of retail prices is the risk of what economists call a "price squeeze". This is simply the risk that the retail price the operators are allowed to charge is too close to, or even below, the input costs that they themselves face in providing the roaming service (most of which are attributable to wholesale charges from foreign operators in roaming destinations). The operators get "squeezed" between the price cap and their costs, potentially forcing them out of the market.

To avoid the risk of a price squeeze, the government or regulator leading the analysis could:

a. consider making the retail price cap applicable only to an opt-in plan that operators are obliged to offer (and which customers have to actively choose), rather than forcing the retail price cap to apply to all roaming plans. This would mitigate (but not remove) the risk of price squeeze while still offering protection to consumers concerned enough to actively choose the price-capped plan; or

b. unilaterally regulate retail *margins*, by capping retail charges at a certain percentage level above the wholesale prices your operators are paying to foreign operators.[12] However, depending on how high those wholesale prices are, this approach is limited in its ability to bring prices down.

[11] Note that for certain structural measures, some coordination between countries may be needed. For example, for the local break-out ("LBO") solution in the European Union, if a regulator wishes to allow the use of local data services by inbound roamers on visited networks, home networks in *other* Member States must adapt the home location register ("HLR") in the roamers' home country.

[12] In 2007, ahead of the multilateral work by the Gulf Cooperation Council (GCC), Oman unilaterally set the maximum retail margin for its operators for (voice and data) roaming at 15 per cent above the wholesale price paid to the visited network, plus a further 7 per cent which had to be paid as a tax to the Oman Government. For roaming in the GCC region, this rule has been superseded by the Council's supra-national rules; for each country in the rest of the world, where the 2007 rule continues to apply, a weighted average of that country's IOTs is used. The 2007 rule took the form of "instructions" sent to mobile licensees by letter. See the presentation made at the WTO Symposium on International Roaming in March 2012 by Ms Maitha Ali Jaffar, of the Telecommunications Regulatory Authority of Oman, available at: www.wto.org/english/tratop_e/serv_e/sym_march12_e/presentation_%20maitha_jaffar.pdf, at p.6.

Figure 1: Range of unilateral options

	Example	Implemented unilaterally by…
Light-handed	Enhancing consumer understanding of the cost of roaming	Singapore[13], Australia[14], New Zealand[15], USA[16], Oman[17]
	Requiring consumer's consent to continue billing beyond a certain threshold	Singapore[18], Australia[19]
Mid-level	Retail price caps on roaming services	Oman[20]
Highly interventionist	Decoupling roaming services from domestic services	N/A

Source: Clarke Mosby Mehta 2013

2.3 Acting bi-laterally and multi-laterally

A few countries have now begun to work bilaterally to bring down the price of roaming services. These include the pairs New Zealand and Australia, Singapore and Malaysia, and Singapore and Brunei. They have chosen to work bilaterally to allow intervention to be considered not just at retail level but also at wholesale level. This is one of the idiosyncrasies of international roaming. The wholesale market in which a country's operators purchase the services they need to offer roaming to their customers, is not located in their country, but in the foreign destinations to which the customers travel. This means that the government and regulator have no jurisdiction over the wholesale prices abroad that feed into the retail pricing of the home operators. The solution is to coordinate with other countries.

So far, for simplicity's sake, this is usually only done in groups of two, typically with a nearby country with which much roaming traffic is exchanged. But once such a first step is complete, more ambitious bilateral efforts could be explored. For example, while EU countries have, through their supra-national authorities, addressed the issue of roaming within the EU, it will be up to each individual Member State to pursue bilateral roaming deals with non-EU members.

Multilateral efforts, with three or more countries that do not share a (regulatory or legislative) supra-national authority, could also be considered. This becomes more complicated, and as a result the

[13] From July 2011, Singapore operators had to make clear to customers the prices, terms and conditions of data roaming services so that subscribers could make informed choices on whether to opt for them. Operators also had to obtain explicit consent from consumers before providing any data roaming service.

[14] See supra, footnote 5.

[15] In May 2011, encouraged by the New Zealand Government, mobile operators agreed to a Code for Information on International Mobile Roaming Services and Charges www.tcf.org.nz/content/28ed9b7c-0bea-43af-9270-b1e48f6a7f8a.html

[16] In October 2011, following a 2010 proposal by the Federal Communications Commission to regulate, US operators agreed to an amendment to the Consumer Code for Wireless Service requiring usage alerts to be sent to customers, including "a notification to consumers without an international roaming plan/package whose devices have registered abroad and who may incur charges for international usage". This notification system had to be implemented by April 2013. Further information is available at: www.fcc.gov/bill-shock-alerts

[17] In 2006, Oman required its operators to send a free text message to their roamers, upon arrival abroad, indicating the price for roaming services. These rules were updated in 2013 and now also require operators, amongst other things, to send subscribers notice warning them that most smartphones and their applications are capable of automatically connecting to a roaming operator network when traveling abroad, and providing them with instructions on how to turn off data roaming functions to avoid unnecessary data roaming charges.

[18] See supra, footnote 4.

[19] See supra, footnote 5.

[20] See supra, footnote 6.

examples of multilateral initiatives (Southern African Development Community (SADC), the Arab League, the Association of South-East Asian Nations (ASEAN), the Initiative for the Integration of Regional Infrastructure in South America (IIRSA) have generally not yet led to significant concrete measures.[21]

Whether a country chooses to work bilaterally or multilaterally, a key issue in choosing to work with other countries is the possibility of generating "most favoured nation" claims from third countries. If a country is a signatory to the General Agreement on Trade in Services (GATS), then under Article II of that Treaty, it must "accord immediately and unconditionally to services and service suppliers of any other Member treatment no less favourable than that it accords to like services and service suppliers of any other country". This could mean, for example, that if a country decides to set a wholesale price at which operators from the partner country can purchase roaming services, a different World Trade Organisation (WTO) signatory could lodge a claim seeking access to that wholesale price for its operators too. What's more, unless it has instituted its own wholesale price rules, that country would not be obliged to force its operators to offer any given wholesale price to the operators of the original country. The access to the regulated price would be "non-reciprocal".

There are a number of ways of managing this risk:

- A country may form part of a supra-national block that is itself a signatory to the GATS. This is the case, for example, of the European Union. In such a case, legislation by the supra-national authorities that sets wholesale price caps in favour of operators from within the block, can be seen as an internal measure, rather than an external one in favour of any other GATS signatory. As such, most favoured nation rules should not apply.
- Article V of the GATS provides that, subject to certain conditions, the Treaty does "not prevent any of its Members from being a party to or entering into an agreement liberalizing trade in services between or among the parties to such an agreement…". This could mean that, if a country pursues roaming arrangements with another country with which it has a comprehensive trade agreement that liberalises trade in services, third countries would not be able to lodge "most favoured nation" claims seeking access to wholesale price caps for their operators.
- A country may simply tailor its remedies to avoid the likelihood of a "most favoured nation" claim. While operators in a third country may be keen to seek access to regulated wholesale prices a country has set, they are less likely to be interested in gaining access to other regulatory measures.

Take for example a mobile "local access" service, as available between Hong Kong (China) and China, amongst other destinations. This service allows roamers, when they enter a foreign destination, to choose between communicating as a roamer or communicating as a local, without having to swap SIM cards, and without losing the ability to receive incoming calls on their home number. If partner countries require operators to offer the other country's operators a wholesale local access that facilitates this service, and then require operators to offer such a service to their end-users, roamers between the two countries will gain the ability to access local rates when they want to, and retain access to roaming services when that is preferable.

It is far from certain that operators in third countries would push for access to the wholesale service that a country requires operators to provide. This is why mobile "local access" services remain the exception, rather than the rule, worldwide.[22]

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[21] SADC initiative is the exception, although it remains to be seen if its national regulators have the tools they need to implement the "Roam Like a Local" solution they have been tasked with overseeing (see footnote 31). In addition, in August 2013, it was announced that Caribbean countries, through the Caribbean Telecommunications Union (CTU), had successfully negotiated with one mobile operator (Digicel) to charge domestic rates for voice roaming within its Caribbean and US footprint: see the speech of the CTU president dated 9 August 2013 at www.jis.gov.jm/news/leads/34773

[22] China Mobile is the leading practitioner of mobile local-access services. Its customers in China, Hong Kong (China), Macau and Pakistan can purchase a local-access option when travelling to and from these destinations. See, for example, the offer from its Pakistan subsidiary Zong at www.zong.com.pk/international_roaming_chine-ease.html

In February 2013, New Zealand and Australia announced that they would be passing legislation to enable their sector-specific regulators to impose a mobile local-access obligation on their operators. The European Union has mandated that EU operators offer a data-only version of local-access by mid-2014.

Figure 2: Bilateral, multilateral and supra-national agreements

Bilateral		Multilateral		Supranational	
2010	Singapore-Malaysia[23]	**2008**	Arab League[24]	**2007**	European Union[25]
2012*	Singapore-Brunei[26]	**2009***	Latin America[27]	**2008**	Gulf Cooperation Council[28]
2013*	New Zealand-Australia[29]	**2011**	ASEAN[30]		
		2012*	SADC[31]		
		2014*	Trans-Pacific Partnership[32]		

* Implementation pending

Source: Clarke Mosby Mehta 2013

[23] In June 2010, the Ministers responsible for telecommunications in Singapore and Malaysia announced that they had agreed to reduce (voice and SMS) roaming prices between the two countries. This agreement became effective from 1 May 2011: www.ida.gov.sg/About-Us/Newsroom/Media-Releases/2011/Singapore-and-Malaysia-to-Reduce-Mobile-Roaming-Rates

[24] In June 2008, the Arab Telecommunications and Information Council of Ministers (www.aticm.org.eg – available only in Arabic) adopted Resolution No. 219 of 4 June 2008 approving measures on roaming charges transparency, as requested in the AREGNET Recommendation of 8 April 2008 on the international mobile roaming rates applied among Arab countries.

[25] In June 2007, the European Union adopted Regulation (EC) No.717/2007 dated 27 June 2007 on roaming on public mobile telephone networks within the Community, since amended by Regulations adopted in June 2009 and June 2012.

[26] In June 2012, Singapore and Brunei announced an agreement to bring down international roaming charges: www.ida.gov.sg/About-Us/Newsroom/Media-Releases/2012/Brunei-Darussalam-and-Singapore-Pledge-Commitment-to-Reduce-Mobile-Roaming-Rates

[27] Since 2009, as part of the Initiative for Integration of Regional Infrastructure in South America (IIRSA), both the Inter-American Telecommunication Commission (CITEL) - grouping administrations - and the Latin-American Forum of Telecommunications Regulators (REGULATEL) - grouping regulators - have instigated work on international roaming between Latin American countries. For example, in May 2013, CITEL's "Permanent Consultative Committee I" adopted a recommendation on "Regional Measures to Improve the Roaming Service in the Region" (not published at the date of writing), recommending that all Member States "ensure that users pay a competitive price for the roaming service contracted—voice, data, and SMS" and "promote the implementation of measures to lend transparency to service provision conditions". Industry also launched a Data Roaming Transparency Scheme in September 2012: see www.gsma.com/newsroom/gsma-latin-america-launch-data-roaming-transparency-scheme

[28] In May 2008, the GCC Ministerial Committee for Post, Telecommunications and Information Technology decided to introduce a retail price cap for outgoing international calls within the bloc, at 15 per cent above the charge for an equivalent IDD call. See Resolutions of the 17th Meeting of the Ministerial Committee for Post, Telecommunications and Information Technology of GCC held on 28 May 2008, as reported, for example, at p.3 of the public consultation of the Bahrain regulator TRA dated 18 April 2009: www.tra.gov.om/newsite1/Portal/Upload/Documents/283_MainConsultationPaperonRegulationoftheInternationalMobileRoaming.pdf .

[29] In February 2013, New Zealand and Australia announced an agreement to enhance the powers of their national telecommunications regulators in roaming services between their two countries: www.beehive.govt.nz/release/cer-strengthened-after-queenstown-talks.

[30] In July 2011, the ASEAN Telecommunications Regulators' Council (ATRC) added to their "Record of Intent" an Addendum on Intra-ASEAN Mobile Roaming Rates. The Addendum apparently sets out a framework that two or more ASEAN Member States can decide to adopt through an exchange of letters; it thus serves simply to facilitate bilateral and multilateral arrangements between ASEAN countries. In the Joint Ministerial Statement of the 11th ASEAN Telecommunications and IT Ministers Meeting dated 9 December 2011, Ministers welcomed the framework and encouraged Member States to "take a proactive consideration" about entering bilateral arrangements on international roaming: available at: www.asean.org/communities/asean-economic-community/category/press-releases-13

[31] In November 2012, SADC Ministers meeting in Mauritius approved the Guidelines on Implementation of Roam Like a Local (the "RLAL Guidelines"), which should become available in due course at www.crasa.org/crasa-publication.php?name=Regulatory%20Guidelines. RLAL aims "to ensure that a customer to a SADC network, while roaming, should not be significantly disadvantaged as compared to a local customer of the visited country" (section 4.0). Mobile operators across the region are asked to implement RLAL by June 2014 (but with a grace period of one year after that), and national regulators are responsible for ensuring that they do. SADC has also published Guidelines on pricing transparency for regional roaming services, available at: www.crasa.org/tempex/doc_pub_eng83.pdf

[32] The Trans-Pacific Partnership is a free trade agreement which, at the time of writing, is still being negotiated by the 12 countries involved: Australia, Brunei, Canada, Chile, Japan, Malaysia, Mexico, New Zealand, Peru, Singapore, the US and Vietnam. Press reports suggest that the draft text of the agreement contains provisions designed to facilitate bilateral roaming deals between participating countries, notably by protecting against most-favoured nation claims. See, for example, the report in the Australian Financial Review dated 12 November 2013, available at: www.afr.com/p/technology/trade_rules_could_lead_to_lower_9XT1VkTlePyKTxgl11sNxK

3 Running a roaming analysis

This section set out requirements and provides possible approaches for analysing or investigating international roaming services, to gather information on which to base decisions, be it to intervene or to refrain from intervening.

For this, there are two main types of information:

- publicly available information from operator websites and promotional material; and
- commercially sensitive information from mobile operators directly.

3.1 Publicly available information

It may be appropriate to begin the analysis or investigation by collecting publicly available information in order to check, without overly burdening any parties, whether it is worthwhile launching a fully-fledged investigation into the roaming market. If publicly available information suggests that the market is heading in the right direction, at the right speed, then further, ultimately unnecessary investigation can be avoided.[33]

Publicly available information will include headline retail prices,[34] charging units (e.g. per minute or per second), and the availability of alternative, potentially more economic, packages such as "data bundles". Issues like service reliability and the transparency of pricing can also be assessed (online forums can provide useful material in these areas). And, rather than taking just a snapshot of these matters at a given point in time, it would be useful to compare all the metrics with the situation as it existed at some recent point in the past. This will give a sense of whether the market trend shows improved outcomes for roamers.

New Zealand and Australia took this approach. In May 2010, they issued a high-level "discussion document", based on publicly available information. The discussion document compared retail pricing, service quality and features of roaming between the two countries, as it existed in 2007 against how it existed in 2010.[35] The result suggested little improvement (at least in prices and price transparency) over the period in question. The discussion document also compared retail prices available to roamers from New Zealand and Australia against prices available to their counterparts in Singapore, the USA and the United Kingdom.

Once responses to the discussion document were considered, the New Zealand and Australia governments decided that there was cause for concern and so launched a fully-fledged market investigation in April 2011.[36] It is of note that this is almost a year after the discussion document was published. In this context, if time is of the essence, it may be more appropriate for a country to proceed directly to a full market investigation using commercially sensitive information.

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[33] If necessary, the examination of publicly available information can then be repeated at a later date, to see if conclusions differ.

[34] Little information is publicly available about wholesale pricing for international roaming.

[35] A copy of the discussion document is available on the DBCDE website, at www.dbcde.gov.au/mobile_services/mobile_roaming/trans-tasman_mobile_roaming_discussion_paper

[36] The two governments set out the reasons for their decision in a document available at: www.dbcde.gov.au/__data/assets/pdf_file/0005/133943/Reasons_for_the_joint_decision_to_launch_a_New_Zealand-Australia_market_investigation_into_trans-Tasman_mobile_roaming.pdf

Figure 3: Extract from New Zealand / Australia discussion document of May 2010[37]

58. The table below compares the total charges faced by a typical New Zealand roamer travelling to Australia in Q1 2010 with the total charges using Q4 2007 prices[13]. Comparing the two sets of figures shows that prices (in nominal terms) have generally decreased only slightly for New Zealanders voice roaming in Australia over the last two years. In one case, the prices have increased.

Operator	Offer	Total fee (NZ$): Postpaid		Total fee (NZ$): Prepaid	
		Q4 2007	Q1 2010	Q4 2007	Q1 2010
Telecom	WorldMode / BlackBerry	28.75	26.25	n/a	n/a
Vodafone	Standard	29.25	29.00	39.25	50.25
	VF Traveller	20.37	19.46	27.25	27.25

Sources: *New Zealand Ministry of Business, Innovation and Employment*
Australian Department of Broadband, Communications and the Digital Economy

3.2 Commercially sensitive information

Mobile operators will hold a range of roaming information that they consider commercially sensitive. Some of this information will be sensitive because of its commercial nature (e.g. recent revenues and traffic volumes) while some of it will be sensitive simply because it is still in development (e.g. plans for price changes or for introducing new ways for customers to manage their roaming spend).

An organisation may or may not have the legal right to collect such information from mobile operators. Typically, a sector-specific regulator or ex post competition authority will have such a right, while a government might not. To facilitate matters, it can however be useful for operators to supply such information as in the absence of the information requested, they run the risk that government roaming decisions may be based more on perception than on fact.

When working in partnership with one or more countries, the next issue will be whether there is a legal right to share the commercially sensitive information collected with your counterpart organisation in those countries. For a sector-specific regulator or an ex post competition regulator, this will likely depend on whether the legislation establishing an organisation or authority provides for such information sharing and, if it does, whether the necessary pre-requisites to sharing with any given country (say, a cooperation agreement signed by the regulators concerned) have been met. Once again, a government authority may need to use subtle means of persuasion to gain operator cooperation.

Why would organisations (especially from different countries) want to share commercially sensitive roaming information? Well, the wholesale market that is relevant to roamers from one country is in another country where operators purchase the wholesale services they then repackage into a retail roaming experience, and the price at which they purchase those wholesale services affects the price roamers pay when travelling. In an ideal world, therefore the opportunity to examine those wholesale prices, to see if they are unreasonably high and/or failing to trend down over time would be necessary. A counterpart organization or authority in the other country will have a similar incentive to see the wholesale prices that operators are charging.

[37] This table concerns billing for voice roaming. The New Zealand Ministry constructed a typical profile for a New Zealand roamer in Australia: ten outgoing calls (two calls within Australia, eight calls back to New Zealand, no calls to third countries) and three incoming calls, with an average call duration of 2¼ minutes. The figures in the table represent the total bill that the roamer would face for these calls. At the time of writing, NZD1 = USD84.

It will not be fatal to the analysis or investigation if, for some reason, counterpart organisations are unable to share information collected from operators. It will however mean that the analysis will rely on the counterpart's assessment of the wholesale market, and which operators are very likely to blame for the high retail prices they may be charging. This "game of trust" could increase the risk of regulatory error, as it would be difficult to ensure that both organisations were applying comparable information gathering and assessment methodologies, to the related wholesale and retail markets.

3.3 Working with traffic and revenue information

For analysis and investigation, it will be important to consider all elements of the market:

- whether service quality is adequate;[38]
- whether a wide range of features are available;[39]
- whether prices are advertised in a transparent and clear manner;[40] and of course
- whether prices are competitive and/or trending down over time.[41]

However, it is fair to say that the analysis of pricing will be a prime aspect of any market investigation. In this regard, there are some important matters to bear in mind:

First, collect and analyse the pricing information under two broad categories: "home network" information; and "visited network" information. Each operator in a country will function simultaneously as a home network and a visited network. These are two unrelated activities and should be analysed as such. This can be considered as "commercially sensitive data" and may not be made available.

Second, in order to present a fair reflection of pricing levels, group together the figures for outgoing and incoming communications. This means, for example, considering home network revenues from calls made, and home network revenues from calls received, as a single revenue stream; home network revenues from text messages sent, and home network revenues from text messages received, as a single revenue stream; and home network revenues from data uploaded, and home network revenues from data downloaded, as a single revenue stream. This allows for the pricing practices of operators, who may (especially at retail level) charge more for communication in one direction in order to subsidise communication in the other direction. For example, in their capacity as home networks, operators typically charge what seems a high retail roaming rate for outgoing SMS, but this helps them subsidise

[38] Service quality concerns such matters as the reliability of the roaming service (how often roaming becomes unexpectedly unavailable due to network problems) and the clarity of sound (do users complain of differences with their normal domestic experience). Operators can provide objective data on these indicators. If they do not cooperate, other sources are available, such as operators' annual reports, newspaper reports of outages, and surveys of customers.

[39] This can be gauged by comparing the number of features available for roamers, compared with the number of features available for domestic mobile users. Beyond the basic voice, SMS and data communications features, this might include voicemail, short-code dialling, video-calling, call barring, caller ID, call forwarding and call waiting.

[40] Transparent prices help customers choose the mobile roaming product that best meets their needs. Such measures include clearly listing prices on operator websites or stores, being clear about whether voice billing is "per minute" or "per second", and offering easy-to-understand prices such as "per day' data roaming rates.

[41] Determining whether prices are competitive will consist in comparing the (wholesale and retail) prices operators charge against appropriate benchmarks. Those benchmarks might include: prices in the past (in the telecommunication industry, prices for the same service should generally fall over time as sunk costs are recovered); prices paid by roamers from various countries, when roaming in the same destination; cost estimates prepared by reputable economists. Examples of all these approaches can be found in the May 2010 discussion document and August 2012 draft report prepared in the course of the New Zealand-Australia roaming investigation, available at:
www.communications.gov.au/mobile_services/mobile_roaming/trans-tasman_mobile_roaming

free incoming SMS. Figure 4 uses illustrative figures to demonstrate how an analysis that follows this approach might look.

Figure 4: Example analysis of traffic and revenue information

Capacity in which operator is acting	Communication type (outgoing and incoming)	Revenue in a given year (USD)	Units of traffic (mins/SMS/MB)	Average price per unit (USD)
Home Network (retail activities)	Voice	10 000 000	33 000 000	0.30
	SMS	8 000 000	16 000 000	0.50
	Data	15 000 000	10 000 000	1.50
Visited Network (wholesale activities)	Voice	20 000 000	200 000 000	0.10
	SMS	12 000 000	60 000 000	0.20
	Data	35 000 000	46 667 000	0.75

Note: Figures are fictitious.
Source: Clarke Mosby Mehta 2013.

Third, in addition to revenues, it is important to consider the costs that operators face, both when they act as home networks and when they act as visited networks. In this regard, as a visited network, most (though not all) of the costs operators incur will be from activities they perform themselves, such as originating the communications made by foreigners who are present on their network, and terminating the communications that are received by those same foreigners. However, as a home network, while operators will incur some costs from undertaking their own activities (e.g. costs created from forwarding incoming communications to their roamer when he or she is abroad, and from marketing and billing the roaming service), most of the costs they bear will take the form of wholesale charges from the foreign network on which their roamer is hosted.[42] A useful overview of the different costs faced by visited networks and home networks is contained in the expert costing report commissioned by the New Zealand and Australia ministries.[43]

3.4 Other sources of information

As noted above, there are generally two main types of information relevant to an investigation: information from publicly available sources, and commercially sensitive information from operators. There are, however, supplementary types of information to consider.

One such type is survey data. Collecting survey data can take a lot of time and resources, and the results may not necessarily sit well with broader policy directions. However, it can also lead to a much better, evidence-based decision on whether (and how) to intervene.

[42] These wholesale charges include, but are not limited to, the infamous "Inter-Operator Tariffs" or IOTs.

[43] See Table 30 of the WIK report "Trans-Tasman Roaming: Service Costs", 30 May 2012, at p.83, available at: www.dbcde.gov.au/__data/assets/pdf_file/0017/157013/Trans-Tasman_Roaming_WIK_Study_-_Public_version.pdf

The European Union relied in part on customer survey data to justify its decision to step into the roaming issue (after regulators had acted) in 2006,[44] as well as to shape its proposals for revisions to the rules in 2011.[45] New Zealand and Australia also used survey data, both to assist with "market definition" and to help quantify the impact of high roaming charges on individuals and businesses.[46]

Another type of information to consider is expert reports. These can involve additional expense but, ensuring a better understanding of the roaming market can make assessment of whether or not to intervene, a much more robust one.

One application for such reports is in estimating the costs that operators incur when undertaking activities themselves (originating and terminating communications, forwarding communications through to the network on which the roamer is hosted, etc.). New Zealand and Australia commissioned such a report to assist with their investigation.[47]

A final type of supplementary information is the research already undertaken by bodies such as the Organisation for Economic Cooperation and Development (OECD) and the European Union Body of European Regulators of Electronic Communications (BEREC). The OECD has produced papers that examine the causes of high roaming prices and potential measures that countries can consider to remedy them.[48] BEREC has, amongst other actions, produced estimates of the cost of the most relevant roaming services.[49]

4 Choosing the appropriate intervention mechanisms

Once the roaming analysis and investigation has been carried out and that some form of intervention is required, what intervention is possible and how is it chosen?

4.1 General considerations

For a sector-specific regulator or an ex post competition regulator, the range of interventions available will likely be set out in legislation. For example, the legislation governing a sector-specific regulatory authority may enable it to impose price caps on wholesale international roaming services, while the legislation governing an ex post competition regulator may enable it to impose fines on operators.

For a government, although there will be a much wider range of options, it would nevertheless be wise to consider the nature of the national telecommunication regulatory regime in place. A light-handed regime

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[44] See European Commission press release dated 7 November 2006, available at: http://ec.europa.eu/information_society/activities/roaming/regulation/archives/eurobarometer/index_en.htm. The survey of European citizens, published on 7 November 2006, is available at: www.ec.europa.eu/public_opinion/archives/ebs/ebs_269_en.pdf

[45] See European Commission press release dated 14 February 2011, available at: http://ec.europa.eu/information_society/activities/roaming/what_is/report/index_en.htm

[46] See Trans-Tasman Roaming: Final Report, February 2013, available at: www.communications.gov.au/mobile_services/mobile_roaming/trans-tasman_mobile_roaming

[47] The report, by WIK Consultants, is available at: www.dbcde.gov.au/__data/assets/pdf_file/0017/157013/Trans-Tasman_Roaming_WIK_Study_-_Public_version.pdf

[48] See, for example "International mobile roaming charging in the OECD area", 21 December 2009, at www.oecd.org/data**oecd**/41/40/44381810.pdf; "International mobile roaming services: analysis and policy recommendations", 11 May 2010, at www.oecd.org/sti/ieconomy/48460109.pdf; and "International mobile data roaming", 30 May 2011, at www.oecd.org/sti/broadband/48127892.pdf

[49] See, for example, the BEREC report entitled "International Mobile Roaming Regulation", dated December 2010, available at: http://berec.europa.eu/eng/document_register/subject_matter/berec/reports/206-international-mobile-roaming-regulation-berec-report

might suggest that less intrusive measures are more appropriate, while a heavy-handed regime might mean that few options are off the table. Drawing on this "regulatory context" will ensure the theme of consistency that foreign investors in telecommunication markets appreciate.

Beyond these general parameters, the main consideration in choosing the appropriate intervention will be the extent of the problem that the government or regulator is looking to solve, and the proportionality of the intervention to that problem. If competition is improving through market forces but "bill shock" remains an issue, then measures aimed at improving consumer understanding of roaming prices may be all that is required. But if prices bear no relation to costs, and have remained stagnant for some time, it may be appropriate to consider price caps or structural intervention. The balance to be struck between competition and investment (or, in other terms, static and dynamic efficiency) should also be considered.

If one country has decided to partner with another country in conducting the investigation, some additional considerations will apply.

First, as outlined earlier, a wider range of options will be available if one country has a comprehensive trade agreement with another country (considering the options), because that could protect the operators from "most favoured nation" claims for unreciprocated access to, for example, wholesale price caps.

Second, the enthusiasm for wholesale measures, or retail measures, may depend to some degree on whether operators in the country concerned are "net inbound" or "net outbound", vis-à-vis the operators in the country with which it is working (although both will affect tax levies, but this is another issue that has to be discussed):

a. Net inbound operators make more money as visited networks (hosting foreign roamers on their network), than they do as home networks (charging their own customers who roam abroad). They are therefore more heavily affected by measures affecting wholesale prices.

b. Net outbound operators make more money as home networks than they do as visited networks, and so they are more heavily affected by measures affecting retail prices.

This issue was apparent when the European Union first considered its intervention in the intra-EU roaming market, with sunny "Southern" Member States (who receive many tourists) preferring retail price caps and "Northern" Member States (who send many tourists) preferring wholesale price caps.[50]

4.2 Interventions that aim to solve the underlying competition problem

It is no secret that competition between operators is typically less intense in respect of international roaming services than it is for domestic mobile services. The reasons for this have been expertly outlined elsewhere,[51] and can be expressed as follows:[52]

"a. First, international mobile roaming services are reciprocal between mobile operators. This means that, for a given operator, the wholesale component of international roaming is not just a source of cost (payments to the foreign operator) but also a source of revenue (payments from the foreign operator). As a result, operators do not make their choice of partner network on the sole basis of the wholesale price terms they have to pay; they will also consider the amount of "return traffic" that they will receive from the potential partner, as the payments

[50] In sunny countries there is also an additional incentive for governments to reduce retail charges for tourists: it lowers the cost for visiting that country, potentially increasing the number of tourists.

[51] Shortall, T., "A Structural Solution to Roaming in Europe", 2010, a working document of the European University Institute, available at: http://cadmus.eui.eu/bitstream/handle/1814/14398/RSCAS_2010_62.pdf

[52] See Regulatory Impact Statement, Trans-Tasman mobile roaming: final report, 15 November 2012, available at: www.treasury.govt.nz/publications/informationreleases/ris/pdfs/ris-mbie-ttmr-may13.pdf

they receive for this traffic can improve their net wholesale outcome (by offsetting their own payments to the foreign operator). This means that it may make economic sense for an operator to choose to pay a high price to a foreign operator with a lot of return traffic, over a low price to a competing foreign operator with little return traffic.[53]

b. By contrast, and second, retail roaming is a "subsidiary" service that is bundled with (or "tied to") domestic mobile services. As a result, customers' choice of mobile operator is based primarily on the pricing of the domestic service, rather than on the pricing of the roaming service. This means that customers are unlikely to switch operators in response to a change in the price of roaming, in turn removing any remaining incentive on operators to seek lower wholesale prices or to reduce retail margins."

It would be possible for the intervention to target either or both of these underlying competition issues, in order to unleash increased roaming rivalry between operators.

An intervention targeting the first issue (reciprocity) might involve prohibiting the operators from concluding reciprocal roaming agreements. In other words, in its relationship with any given foreign operator, each of the operators would have to decide to act solely as a visited network (hosting foreign roamers), or solely as a home network (retailing roaming services to its own customers abroad).

For example, imagine that, for a given roaming destination (Country Y), there were three operators: Operator A, Operator B and Operator C. If an operator in Country X chose to act as a visited network vis-a-vis Operator A (hosting the roamers of Operator A while they were in country X), it would be forbidden from asking Operator A to host its own roamers in Country Y. It would need to rely on Operator B or C to host its roamers in that destination.

This approach would have the advantage of encouraging the operator, when choosing between Operator B and C for wholesale roaming services, to opt for the network offering the lower wholesale price, rather than the one with more return traffic (since there would be no return traffic from Operator B or C). That should reduce wholesale prices and so create the potential for retail roaming prices to fall.

However, the approach also reduces the number of foreign networks competing to host the roamers of operators from Country X. So imagine if there were only two networks in Country Y that were technologically compatible with the operator networks in Country X.[54] If Country X's operators were forced to work with only one of them as their visited network (hosting their roamers in that country), then they would be faced with a monopolist. In that scenario, the wholesale prices they pay could actually increase.

In this context, it is not surprising that countries that have introduced reforms targeting the underlying competition problem have attacked the second issue (bundling) instead.

One way of confronting this second issue is simply to unbundle roaming from domestic services. In this regard, the European Union has adopted a regulation requiring mobile operators to offer "the separate sale of regulated[55] retail roaming services" by 1 July 2014.[56] Under this system, operators continue to

[53] This scenario is not unknown in the case of domestic mobile services. For example, mobile termination services are also provided on a reciprocal basis between operators. However, with domestic mobile services, a low wholesale price, to the extent it is passed through into retail prices, can attract new customers. There is therefore an overriding incentive on both operators to agree to a low wholesale price. There are also other factors at play in the case of domestic mobile services (such as on-net/off-net externalities) that distinguish it from the case of international mobile roaming.

[54] Many operators face this issue when seeking international roaming arrangements in the United States.

[55] Only roaming communications that are made and received in the European Union (intra-EU) are concerned. However, operators will likely find it easier to sell *all* international roaming services (regardless of where they are made or received) separately from domestic services.

[56] See Articles 4 and 5 of Regulation (EU) No 531/2012 - 13 June 2012 on roaming on public mobile communications networks within the Union: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2012:172:0010:0035:EN:PDF

provide domestic mobile services to their customers, but must allow their customers to choose a different operator to provide their international roaming services, without having to change SIM cards.

Another way of confronting this issue is to enable roamers to access local numbers in their roaming destination. New Zealand and Australia have taken this approach.[57] In February 2013, they announced that they would be legislating to equip their sector-specific regulators with a wider palette of regulatory remedies, in the event that those regulators later decide it is appropriate to intervene in the market for international roaming between the two countries.[58] One of those remedies is the ability to force operators to offer "local access" services to their customers. This would allow those customers to make and receive communications using a mobile telephone number from the visited destination (i.e. as a local user) as well as using their usual home number (i.e. as a roamer).

When unbundling is introduced in the European Union, and if local-access services are mandated by the regulators in New Zealand and Australia, customers' choice of operator for mobile services while abroad need no longer be based on the pricing of the domestic service. This will mean that customers are more likely than at present to switch roaming providers in response to a change in the price of roaming. As a result, it is hoped, operators will compete more aggressively on roaming prices.

4.3 Interventions that treat the symptoms

Trying to solve the competition problem that underlies international roaming is a complex approach. Perhaps for this reason, treating the symptoms of the problem – notably high roaming prices – has proven more popular.

In this regard, it is possible to require operators to make it clearer to their roamers how much they will be paying. The resulting "transparency" of retail pricing, it is hoped, should ensure that roamers avoid "bill shock". As discussed above, countries as diverse as Oman, Singapore, Australia and the United States have followed this approach, as have the supra-national authorities of the European Union and the GCC. Specific measures have included personalised text messages that roamers receive on arrival, indicating the prices they will pay, and requiring operators to receive express permission from roamers to continue billing after a given bill threshold has been reached.

At a more interventionist level, it is also possible to set price caps for international roaming, either at wholesale level, retail level, or both. Singapore, Malaysia and Brunei have done so, as again have the European Union and the GCC. All have opted for caps at both wholesale and retail level, since wholesale-only caps would not ensure savings were passed through to roamers, while retail-only caps would create a risk of "price squeeze"[59] (also discussed earlier in this guide). Meanwhile, New Zealand and Australia have equipped their regulators with a palette of roaming remedies that includes wholesale and retail price capping.

One of the challenges of price caps is determining the level at which they should be set. For example, it is common for regulators, when capping wholesale prices for national telecommunications services generally, to use a cap based on estimates of the costs of providing the service. However, there are

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[57] The European Union has mandated a similar, but more limited, system (in addition to its unbundling requirement). The European "local access" approach is only for data services, not voice and SMS (which will continue to be provided under the traditional international roaming model), and only provides for a direct billing arrangement between the roamer and the visited network in the visited destination. The New Zealand and Australian approach, which applies to voice, SMS and data services, allows for the scenario where the roamer wishes to have a local number, but prefers to keep the billing relationship strictly with the home network.

[58] This is the key way in which the New Zealand and Australia reforms differ from those of the European Union. While the European Union has actually decided to implement the changes, New Zealand and Australia have simply given their regulators the power to implement the changes. The threat of such intervention was judged by the New Zealand and Australia authorities to be sufficient to ensure more competitive market outcomes.

[59] A price squeeze is not a risk in the special case of caps on retail margins, such as implemented by Oman.

precious few cost estimates that have been commissioned for wholesale roaming services[60] and, as a result, benchmarking could become impractical and the regulatory organisation or authority may have to consider financing a cost estimate itself.

In respect of retail price caps, the challenges are even greater. Retail price capping is not a common measure in telecommunication markets, outside of universal service provisions mostly related to fixed-line telephony, so there is little established practice to follow. In this context, it is perhaps not surprising that Singapore and Malaysia, for example, simply started at market prices and demanded a percentage reduction each year, while the European Union set retail caps that represented more a political compromise between the European Parliament and the Council of Ministers than an accurate reflection of costs incurred by mobile operators.[61]

4.4 The threat of intervention

Sometimes, the simple fact of launching an analysis or investigation into roaming services provides incentives to see prices tumble. This was certainly the case in the European Union in the run-up to the adoption of the 2007 Regulation and, as can be seen from Figure 5, also occurred in New Zealand between May 2010 (when the initial discussion document was published) and February 2013 (when the roaming reforms were announced).

[60] The cost estimates commissioned by the New Zealand and Australian Governments, and prepared by WIK Consulting, are one of the few examples, and are available at:
www.dbcde.gov.au/__data/assets/pdf_file/0017/157013/Trans-Tasman_Roaming_WIK_Study_-_Public_version.pdf

[61] The IMCO committee of the European Parliament, in the course of its deliberations over the EU Regulation of 2007, did however commission a report by Copenhagen Economics that proposed wholesale and retail price caps based broadly on estimated costs. See "An Assessment of the Commission Proposal on Roaming", February 2007, available at: www.europarl.europa.eu/comparl/imco/studies/0702_roaming_en.pdf

Figure 5: Price changes in New Zealand roaming charges 2010-2013[62]

		Voice (USD/min)						SMS (USD/text)		Data (USD/MB)	
		Outgoing (including checking voicemail)		Incoming		Receipt of voicemail[63]					
2degrees	May 2010	1.17	↓	1.17	↓	1.17	↓	0.67	↓	25.25	↓
	Feb 2013	0.37		0.37		0.37		0.66		0.42-0.80	
Vodafone	May 2010	1.68	↓	0.84	↔	0.84	↓	0.67	↔	8.42	↓
	Feb 2013	0.74		0.84		0.00		0.67		0.42	
XT	May 2010	0.63-0.75[64]	↓	0.84	↔	0.00	↔	0.67	↔	8.42 per MB	↓
	Feb 2013	0.41-0.75		0.84		0.00		0.67		5.05 **per day** (postpaid) 2.11 per MB (prepaid)	

Source: Clarke Mosby Mehta 2013

Of course, because New Zealand operators tend to be "net inbound" in respect of Australian operators (meaning they make a net profit at wholesale level, as well as earning a retail margin), they had greater scope than their Australia counterparts to reduce their retail prices. The regulatory threat of the joint government investigation was thus able to prompt rapid and significant price drops.

Australia operators, meanwhile, tend to be "net outbound" in respect of New Zealand operators (meaning they make a net loss at wholesale level). This means that they seem more resistant than New Zealand operators to reducing high retail prices; certainly their price reductions in response to the joint investigation have taken longer to occur and been less dramatic. Nevertheless, the response in Australia recently has been encouraging: Optus has announced significant price cuts[65] and VHA has launched a per-day roaming rate for the first time (see table below for comparison with the Telecom NZ per day rate).

[62] Prices have been converted from NZD into USD. At the time of writing, NZD 1 = USD 84.

[63] Traditionally, a roamer has had to pay for the minutes "consumed" by the caller when leaving a voicemail message, even before the roamer has listened to the message.

[64] Price varies according to whether customer is prepaid or postpaid.

[65] See the report from The Spectator dated 21 August 2013 at www.businessspectator.com.au/news/2013/8/21/technology/optus-moves-revamp-global-mobile-roaming-charges

Figure 6: Per-day roaming offers from Telecom New Zealand and Vodafone Hutchison Australia, 2013[66]

	Telecom NZ offer	VHA offer
Applies to	Data roaming only	Voice, SMS and data roaming
Eligible customers	All post-paid customers	Post-paid customers signing up to new plans
Automatic or opt-in	Automatic	Opt-in
Trans-Tasman[67] **per-day rate**	USD5.05[68]	USD4.76
Extra charges	None	Usual domestic charges
Third country destinations?	8 others[69], at USD8.41 per day	2 others, at USD4.76 per day

Source: Clarke Mosby Mehta 2013

It may therefore not be necessary, once the roaming investigation is complete, to choose any form of intervention, as the market may have moved so far forward that the right balance has been struck, at least for the time being.

5 Conclusions

Undertaking an investigation into international mobile roaming services is not easy. Operators will likely have significant resources to argue their case, and may claim to understand the market better than governments and regulators. There may be difficulties in getting traffic and revenue information and, it can seem quite hard to make sense of it.

More precisely, to the extent international mobile roaming prices remain a concern for governments and regulators, this report has been intended to provide the tools on how to undertake an analysis or investigation. It has not been intended to advocate or recommend any investigation but intends to build capacity on how to conduct such enquiries.

In this context, the report has identified the different bodies that can lead an analysis, and the advantages and disadvantages for each one. It has then identified different examples internationally of unilateral action, on the one hand, and bi- or multi-lateral action on the other, before giving guidance on how a country considering such action might gather and analyse relevant market information.

Finally, it has canvassed the three main options open to a country that decides that some form of intervention is appropriate. These options are to treat the underlying competition problems, to treat the symptoms of those problems, or to harness the threat of regulation to provoke meaningful change amongst mobile operators.

66 Prices have been converted from NZD into USD. At the time of writing, NZD1 ≈ USD84.

67 For New Zealanders, "trans-Tasman" means roaming in Australia; for Australians, "trans-Tasman" means roaming in New Zealand. The Tasman Sea separates the two countries.

68 From 3 February 2014, this rate will increase to approximately USD8.41 per day.

69 From 3 February 2014, this increases to 13 third-country destinations.

Annex: The basics of international roaming

Basic concepts

From a mobile operator's point of view, international roaming is a bit like babysitting. When you head to a foreign country with your mobile phone or tablet, your operator will ask an operator in that country to look after you during your stay. When this happens, because you are heading out of the country, your operator will refer to you as an "outbound roamer".

What you may not give much thought to is that, while your mobile operator is busy arranging for you to be babysat abroad, it is itself babysitting a load of foreigners who have travelled to your country. Because these foreigners are arriving in your operator's country, it will refer to them as "inbound roamers".

So, at any given time, your operator will be juggling outbound roamers like you, and inbound roamers using their own mobile devices in your country.

This generates revenue for your operator in two ways. First, it will bill outbound roamers a retail charge for every call they make or receive, every SMS they send and all mobile data they use. (Your operator will have to pay some of this revenue to the babysitting operator but will still make a handsome return). Second, it will bill the relevant foreign operators a wholesale charge for every call made or received, every SMS sent, or every Internet surf performed, by all the inbound roamers.

Put another way, your mobile operator generates retail revenue from outbound roamers, and wholesale revenue from inbound roamers. In this context, if someone speaks of a retail roaming market, they are referring activity concerning outbound roamers. If they speak of a wholesale roaming market, they are referring to activity concerning inbound roamers.

In the industry jargon, in its dealings in the retail roaming market, your mobile operator is acting as a "home network" (because, from an outbound roamer's perspective, it is at home).

By contrast, in its dealings in the wholesale roaming market, your mobile operator is known as a "visited network" (because, from an inbound roamer's perspective, it is being visited).

What does babysitting actually involve?

You might be tempted to think that, while your mobile operator is babysitting all those inbound roamers from abroad, it treats them just the same as it does its own end-users, single-handedly carrying all their communications to the intended recipient. That is not the case.

In fact, in most scenarios, mobile operators treat inbound roamers quite differently from their own end-users. For example, if you are at home in Country X and send a text message to a friend in Country Y, your operator will send the text message directly to the friend's operator in Country Y. By contrast, if an inbound roamer in Country X, who comes from Country Z, sends a text message to a friend in Country Y, your mobile operator will send the text message back to the roamer's operator in Country Z. It will then be up to the roamer's operator to forward the message to Country Y.

This is the way the international standards bodies have set things up. It does however lead to some interesting outcomes. The text message to Country Y will usually take longer to arrive when sent by a roamer, since it has a more convoluted path to navigate to get there.

Financial terms in the babysitting business

Babysitting in the international roaming context is a wholesale business; it's about looking after inbound roamers. And it's to the wholesale market that most of the financial jargon you will hear relates.

One example is the term Inter-Operator Tariff, or "IOT". This is the price that your mobile operator charges a foreign operator every time an inbound roamer makes a call, sends a text message, or uploads/downloads data to the Internet (for example, by posting a tweet or sending an email). In other words, an IOT is a wholesale price that relates to "outgoing" communications.

Many commentators also use the term Inter-Operator Tariff to refer to a wholesale price that relates to "incoming" communications, i.e. the price that your mobile operator charges a foreign operator every time an inbound roamer receives a call or receives a text message. This is incorrect usage. The proper term for a wholesale price in respect of these incoming communications is "termination fee".

Because of their similarity to the terms "outbound" and "inbound", the introduction of the terms "outgoing" and "incoming" creates scope for confusion here. Just try to remember that outbound and inbound are ways of describing different types of *roamer*, while outgoing and incoming are ways of describing the different *directions of communication* involving an outbound or inbound roamer.

Summary of key terms

Term	Describes	Meaning
Outbound	A roamer	Home customer roaming abroad
Inbound		Foreign customer roaming in your country
Net outbound[70]	A mobile operator	The wholesale revenue it generates from hosting inbound roamers is less than the wholesale payments it makes for the hosting abroad of its outbound roamers
Net inbound[71]		The wholesale revenue it generates from hosting inbound roamers exceeds the wholesale payments it makes for the hosting abroad of its outbound roamers
Outgoing	A voice call, SMS or data communication	Made or sent by the roamer
Incoming		Received by the roamer

Source : Clarke Mosby Mehta, 2013

[70] This can also be described as "roaming out".

[71] This can also be described as "roaming in".

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