

International Mobile Roaming

- 2.1 This chapter describes how international mobile roaming (called 'roaming' hereafter) works so as to facilitate discussion of the issues surrounding roaming in later chapters. An explanation is necessary because the delivery and charging arrangements associated with roaming services are far more complex than the delivery and charging arrangements behind domestic mobile services.
- 2.2 The chapter describes the technical process for routing international roaming voice, Short Messaging Service (SMS) and data calls, describes the administrative arrangements that underpin the service, and explains how the costs of roaming services are determined.
- 2.3 Roaming is a service that allows travellers to use their mobile phone while in another country. In other words, it allows someone who has subscribed to a service provider in one country to take their mobile phone to another country and still receive coverage through their subscription in the original country. During the course of the inquiry the Committee focused on roaming services for subscribers of Australian mobile networks who travel overseas, as opposed to subscribers of foreign networks who travel to Australia. The Committee has also largely focused on issues surrounding voice roaming services, however SMS and data services are also discussed in this report.

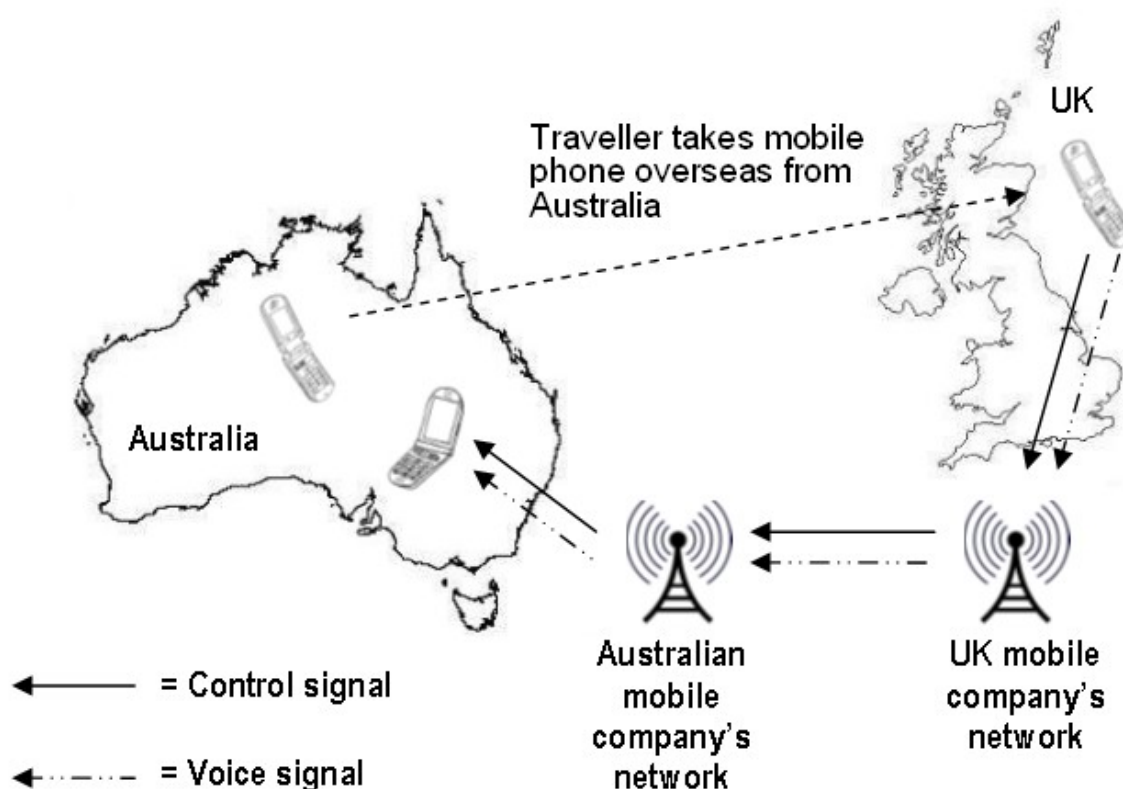
The technical aspects of international mobile roaming

- 2.4 The technical process of a roaming call is called 'routing'. To understand the routing of international mobile, SMS and data roaming services, a basic

understanding of the signalling behind mobile phone calls is needed. A mobile phone call requires two different types of signals: the 'control' signal and the 'voice' signal. The control signal carries the network data of the call. This signal allows for the mobile phone to be identified, and records the destination, length and geographical location of the call. The voice signal carries the actual voice, SMS or data message.¹

- 2.5 The routing of roaming voice, SMS and data calls is such that the 'control' signal must at some point contact the home operator's network.² This is so that the home network operator can recognise and record that a call has been made from the mobile to maintain accurate billing records.³
- 2.6 Figure one below illustrates how both the control and voice signals are routed for a roamed voice or SMS call back to Australia. For the purpose of this example, the country of origin for the roamed call is the UK.

Figure 2.1 – Sending and receiving international voice calls and SMS from and to Australia

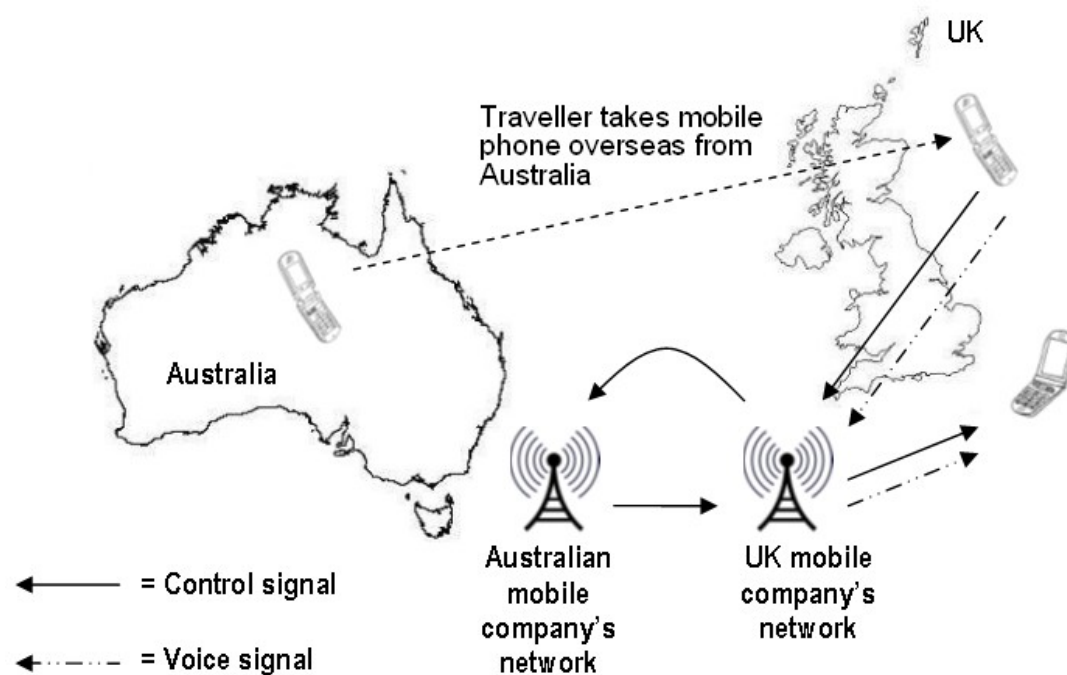


Source Department of Broadband, Communications and the Digital Economy, *Report of findings on: International mobile roaming charges*, 2008, p. 29.

- 1 Brian, M., Tyson, J. and Layton, J., *How Cell Phones Works*, 2000.
- 2 Department of Broadband, Communications and the Digital Economy, *Report of findings on: International mobile roaming charges*, 2008, pp. 29-31.
- 3 Ms Georgia-Kate Schubert, *Transcript of Evidence*, 28 November 2008, p. 51.

- 2.7 First, the traveller's handset connects to a UK based network provider. Both the control and voice signals are then routed from the UK provider's network to the Australian provider's network. Finally, the signals are delivered to the Australian landline or mobile. For a call originating from Australia to a roaming mobile, the route would be reversed.⁴
- 2.8 Figure two below illustrates how a roamed voice or SMS call to a phone in the overseas country the user is calling from is routed.

Figure 2.2 – Sending and receiving voice calls and SMS within foreign country



Source Department of Broadband, Communications and the Digital Economy, *Report of findings on: International mobile roaming charges*, 2008, p. 30.

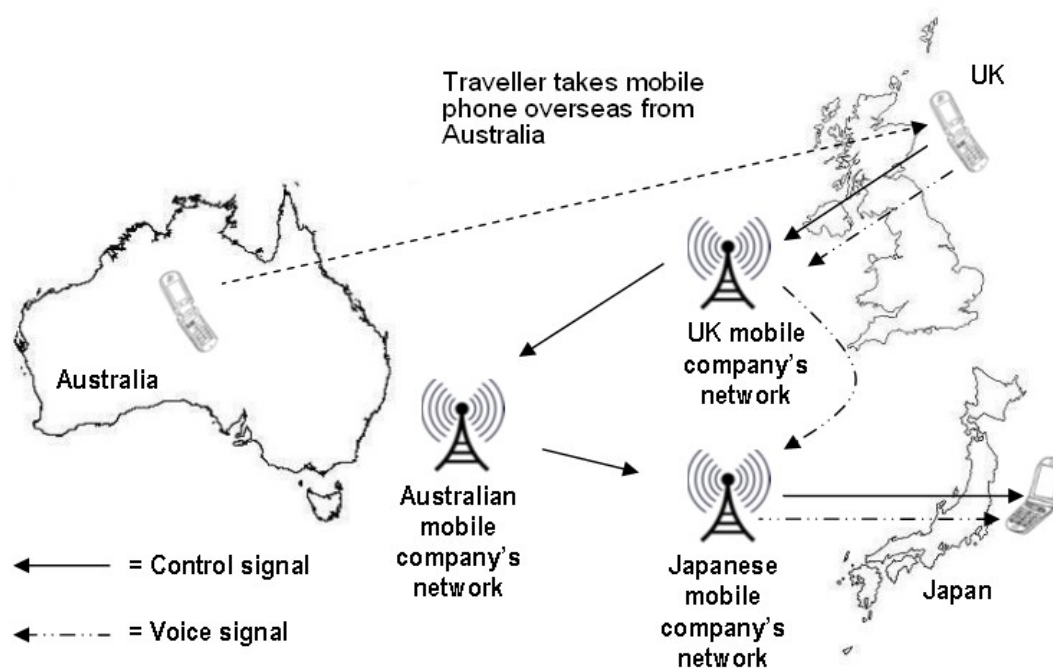
- 2.9 First, the traveller's handset connects to a UK based network provider. The voice signal of the call is routed through the UK provider's network straight to the UK based landline or mobile. The control signal of the call is routed from the UK provider's network to the Australian provider's network. The signal is then routed back to the UK provider's network and delivered to the UK based landline or mobile. For a call originating from a UK based landline or mobile to the roaming mobile, the route would be reversed.⁵

4 Department of Broadband, Communications and the Digital Economy, *Report of findings on: International mobile roaming charges*, 2008, p. 31.

5 Department of Broadband, Communications and the Digital Economy, *Report of findings on: International mobile roaming charges*, 2008, p. 29.

- 2.10 Figure three below illustrates how a roamed voice or SMS call is routed when the user is calling a phone in another foreign country. In this case, Japan has been used.
- 2.11 First, the traveller's handset connects to a UK based network provider. The voice signal of the call is routed from the UK based network straight to the Japanese based network provider and the landline or mobile phone on their network. The control signal of the call is routed from the UK provider's network to the Australian provider's network. The control signal is then routed to the Japanese provider's network and delivered to the Japan based landline or mobile. For a call originating from a Japan-based landline or mobile to the roaming mobile, the route would be reversed.⁶

Figure 2.3 – Sending and receiving international voice calls and SMS from and to other foreign countries



Source Department of Broadband, Communications and the Digital Economy, *Report of findings on: International mobile roaming charges*, 2008, p. 30.

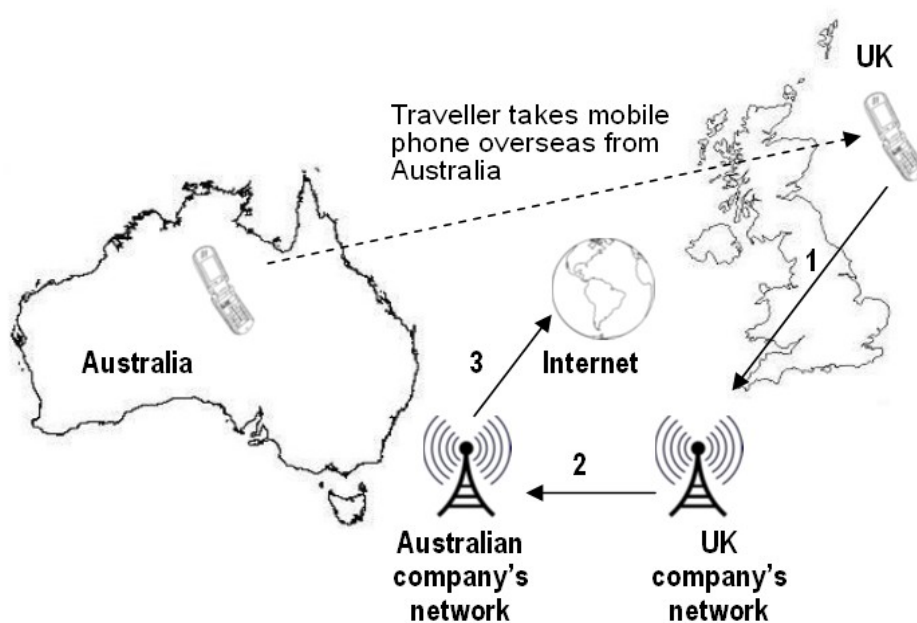
- 2.12 Like voice and SMS services, international data roaming relies on individual party to party agreements between home network operators and visited network operators where information is routed between their mobile networks. The home network operator then connects the device to

⁶ Department of Broadband, Communications and the Digital Economy, *Report of findings on: International mobile roaming charges*, 2008, p. 30.

the internet. Data roaming includes accessing email and the internet from an internet-enabled mobile phone or laptop.

- 2.13 Figure four illustrates the routing for users on Australian networks that utilize international mobile data roaming whilst in the UK. First, the traveller's device connects to a UK based mobile provider's communications network. The data from the device is then transmitted from the UK provider's network to the Australian provider's mobile communication network. The Australian provider's network then connects the device to the internet.⁷

Figure 2.4 – Accessing the internet via laptops and internet-enabled mobile phones



Source GSM Association, *Mobile SMS and Data Roaming Explained*, 2008, p. 5.

Party to party agreements

- 2.14 International voice, SMS and data roaming relies on bilateral agreements between country-of-origin service providers (home network operators) and foreign country service providers (visited network providers).⁸

⁷ GSM Association, *Mobile, SMS and data roaming explained*, 2008, p. 5.

⁸ ACCC, *Mobile services review: International inter-carrier roaming*, 2005, p. 4.

- 2.15 The Australian Competition and Consumer Commission (ACCC) describes these agreements as negotiated between two mobile operators who seek to get the best commercial arrangement depending on the relationship between the two. The Department of Broadband, Communications and the Digital Economy (DBCDE) advised the Committee that there does not appear to be any logic or consistency between party-to-party agreements in different countries and among different providers.⁹ It is difficult to gain insight into the negotiation and operation of these agreements because much of the information surrounding these agreements is claimed to be commercially sensitive.¹⁰ Vodafone Australia, for example, argued that the lack of transparency surrounding these agreements is not unique and is necessary for operators to remain competitive.¹¹
- 2.16 Notwithstanding this, the ACCC found that the general principles behind the agreements have been laid down by the Global System for Mobile communications (GSM) Association. The GSM Association is a wireless industry association facilitating the development, uptake and promotion of GSM mobile technology.¹² GSM technology is a widely used form of mobile phone technology with 80 percent of the world's population being covered by GSM mobile networks.¹³
- 2.17 The GSM Association has developed the Inter-Operator Tariff (IOT) system to guide the charging arrangements set down by operators when negotiating party-to-party agreements. The IOT is charged by the visited network operator to the home network operator for allowing the home network's subscribers to use the visited network.¹⁴
- 2.18 In addition to the IOT, the GSM Association provides a Standard International Roaming Agreement that can be used by operators as a basis for their roaming agreements.
- 2.19 While party-to-party agreements are based on the IOT and the standard agreement, the ACCC argues that the terms of these agreements vary greatly among operators, depending on the market strength of the parties involved.¹⁵

9 Mr Keith Besgrove, *Transcript of Evidence*, 24 September 2008, p. 5.

10 Mr Colin Oliver, *Transcript of Evidence*, 24 September 2008, p. 5.

11 Ms Georgia-Kate Schubert, *Transcript of Evidence*, 28 November 2008, p. 46.

12 ACCC, *Mobile services review: International inter-carrier roaming*, 2005, p. 15.

13 GSM Association, www.gsmworld.com, viewed on 4 February 2009.

14 ACCC, *Mobile services review: International inter-carrier roaming*, 2005, p. 4.

15 ACCC, *Mobile services review: International inter-carrier roaming*, 2005, p. 4.

Charging arrangements

2.20 During the inquiry, the Committee noted that the charging arrangements for international roaming are quite complex. This section will describe the types of end user charges involved in international roaming and the composition of these charges.

Charge types

2.21 The Committee surveyed the types of charges applied by Australian network providers for international mobile roaming services. The information for this survey was sourced from the Telstra¹⁶, Optus¹⁷, Vodafone¹⁸, and '3'¹⁹ websites.

2.22 The survey determined that different charging arrangements apply for outgoing voice calls, incoming voice calls, outgoing SMS, incoming SMS and data services. Below is a description of the charges involved for all five types of services.

Outgoing voice call

2.23 When a traveller places a roamed voice call:

- to a phone within the country they are in;
- to their home country; or
- to another foreign country,

a charge is applied to the traveller who makes the call. This charge is usually a per-minute rate and varies depending on which country the traveller is calling from and the fees negotiated in the agreement between the traveller's service provider and the overseas service provider. These fees may be very different to the fees charged to domestic users of the overseas provider.

Incoming Voice Call

2.24 When a traveller receives a call that originates:

- from the country they are in;

16 Telstra Corporation Ltd, www.telstra.com.au, viewed on 5 February 2009.

17 SingTel Optus Pty Limited, personal.optus.com.au, viewed on 5 February 2009.

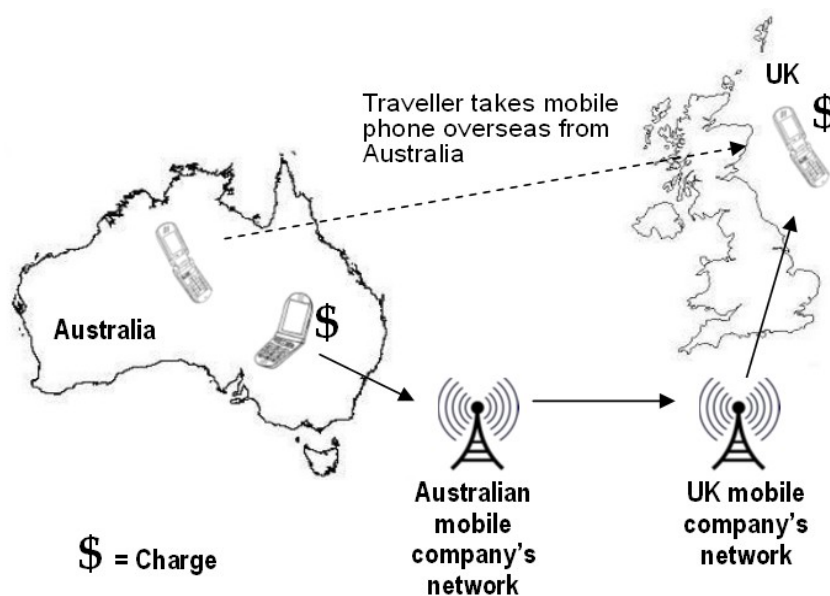
18 Vodafone Australia, www.vodafone.com.au, viewed on 5 February 2009.

19 Hutchison 3G, www.three.com.au, viewed on 5 February 2009.

- from their home country; or
- from another foreign country,

two charges are usually applied. One charge is applied to the person who makes the call to the roamed mobile and a separate charge is applied to the traveller who receives the call on the roamed mobile. The charge to the person who makes the call is the standard charge they would usually face for calling the mobile if it was on its home network. The charge to the traveller is the rate for receiving calls via international roaming mandated by their home network provider. This rate is usually a per-minute charge that varies depending on the country the traveller is in. This differs from local calls where there is no charge for receiving a call. Effectively, the traveller is charged for the international leg of a received call. This arrangement is illustrated below.

Figure 2.5 – Charges when a person in home country calls an internationally roaming mobile



Source Department of Broadband, Communications and the Digital Economy, *Report of findings on: International mobile roaming charges*, 2008, p. 30.

2.25 Figure five shows where the two charges would apply for a person on an Australian network calling a roamed mobile in the UK. First, the person making the call from Australia would pay their usual charge for calling the traveller's mobile if it was on its home network. The call is then routed through the Australian network to the UK network and delivered to the traveller's mobile. The traveller then pays a charge to receive the call on the UK provider's network. This arrangement would be the same for calls to the traveller's mobile that originate from within UK or from another country. Both the caller and receiver would be charged for the call.

- 2.26 The arrangement above is the most common among the providers surveyed. However, the Committee notes that Hutchison 3G offers a deal where travellers do not pay to receive calls in certain circumstances.

Outgoing SMS

- 2.27 In regards to SMS, where a traveller sends an SMS from their roamed mobile to another mobile:
- in the country they are in;
 - in their home country; or
 - in another foreign country,
- a single charge is applied to the traveller only. This charge is usually a set amount for each 160-character SMS message. A message that contains more than 160 characters would be charged as two or more messages.

Incoming SMS

- 2.28 When a traveller receives an SMS message:
- from within the country they are in;
 - from their home country; or
 - from another foreign country,
- only the sender is charged. The sender would face their usual charge for sending an SMS to the mobile if it was on its home network. Usually, no charge is applied to the traveller for receiving an SMS message.

Data

- 2.29 For data roaming, a charge is applied to the traveller to access data services. Usually, this charge relates to the amount of data downloaded and uploaded, or is a fixed fee which provides a limit on the amount of data that can be downloaded and uploaded.²⁰
- 2.30 These charging arrangements are summarised in the table below.

20 GSM Association, *Mobile, SMS and data roaming explained*, 2008, p. 3.

Figure 2.6 – Common international mobile roaming charging arrangements

Type of call (from perspective of roamer)	Charge faced by roamer	Type of charge faced by roamer	Charged faced by other party	Type of charge faced by other party
Outgoing voice call	Yes	Per minute	No	No
Incoming voice call	Yes	Per minute	Yes	Per minute
Outgoing SMS	Yes	Per message	No	No
Incoming SMS	No	No	Yes	Per message
Data	Yes	Per data amount	No	No

Source Telstra Corporation Ltd, www.telstra.com.au, viewed 5 February 2009; SingTel Optus Pty Limited, personal.optus.com.au, viewed 5 February 2009; Vodafone Australia, www.vodafone.com.au, viewed 5 February 2009; and Hutchison 3G, www.three.com.au, viewed 5 February 2009.

2.31 In this chapter the Committee has endeavoured to provide a description of how international mobile roaming works and how the costs are arrived at.

2.32 From the description, it is clear that, both technically and in terms of how charges are determined, roaming is much more complex than standard local calling arrangements. The complexity of roaming is an influence on the cost of roaming services. Of particular note is the fact that a traveller using roaming pays for both made and received calls. For example, a traveller who:

- receives a call, but allows the call to go to voicemail;
- retrieves the message from voicemail; and
- returns the call,

is effectively paying for four international calls. This pricing arrangement is almost certainly responsible for a number of unexpectedly high bills.

2.33 The complexity of the charging arrangements for roaming was identified by the Consumers' Telecommunications Network as a significant part of the problem consumers had with roaming charges:

... they do not understand that if somebody calls them they get charged for a proportion of the call. That charge when they are receiving is not clear. ... even if people try to control their call costs, it is hard for them to calculate if they receive calls from people in other countries and other zones how much it costs them

to receive the call. It is as much as it has been costing them to make calls from overseas.²¹

- 2.34 The Telecommunications Industry Ombudsman reported a particular example, relating to data roaming, which had come to their attention:

We have another case that is still open that I thought I would share with you. This is where the complainant says to us that he approached his company in a retail shop. He said he was off to Europe, specifically to the UK, Ireland and France, and he wanted a plan that could give him internet access while he was there. The company sold him a plan that said it was like home pricing, so that international roaming data charges were the same in selected countries as they are in Australia. It is not cheap, but not outrageous either. The complainant used his internet in Britain and Ireland on this basis and he incurred moderate charges, the same as he would here. He then went to France and that was not included in the like-home pricing. He incurred a debt of several thousand dollars over a few days before he was barred for unusually high usage. He was going back to Ireland where he wanted to use his service and the company insisted that he pay part of those charges, even though they were in dispute. That investigation is still underway at a senior level at the TIO.²²

- 2.35 The Australian Government is not in a position to directly alter these arrangements as they are set in place by the GSM Association. The best that can be done in relation to these arrangements is for the Committee to ensure that travellers are appropriately informed. The suitability of the information provided to travellers is discussed in chapter four.
- 2.36 In the next chapter, the Committee will discuss the findings of previous inquiries into the costs of international mobile roaming.

21 Ms Danielle Notara, *Transcript of Evidence*, 28 November 2008, p. 7.

22 Ms Deirdre O'Donnell, *Transcript of Evidence*, 28 November 2008, pp. 19-20.

