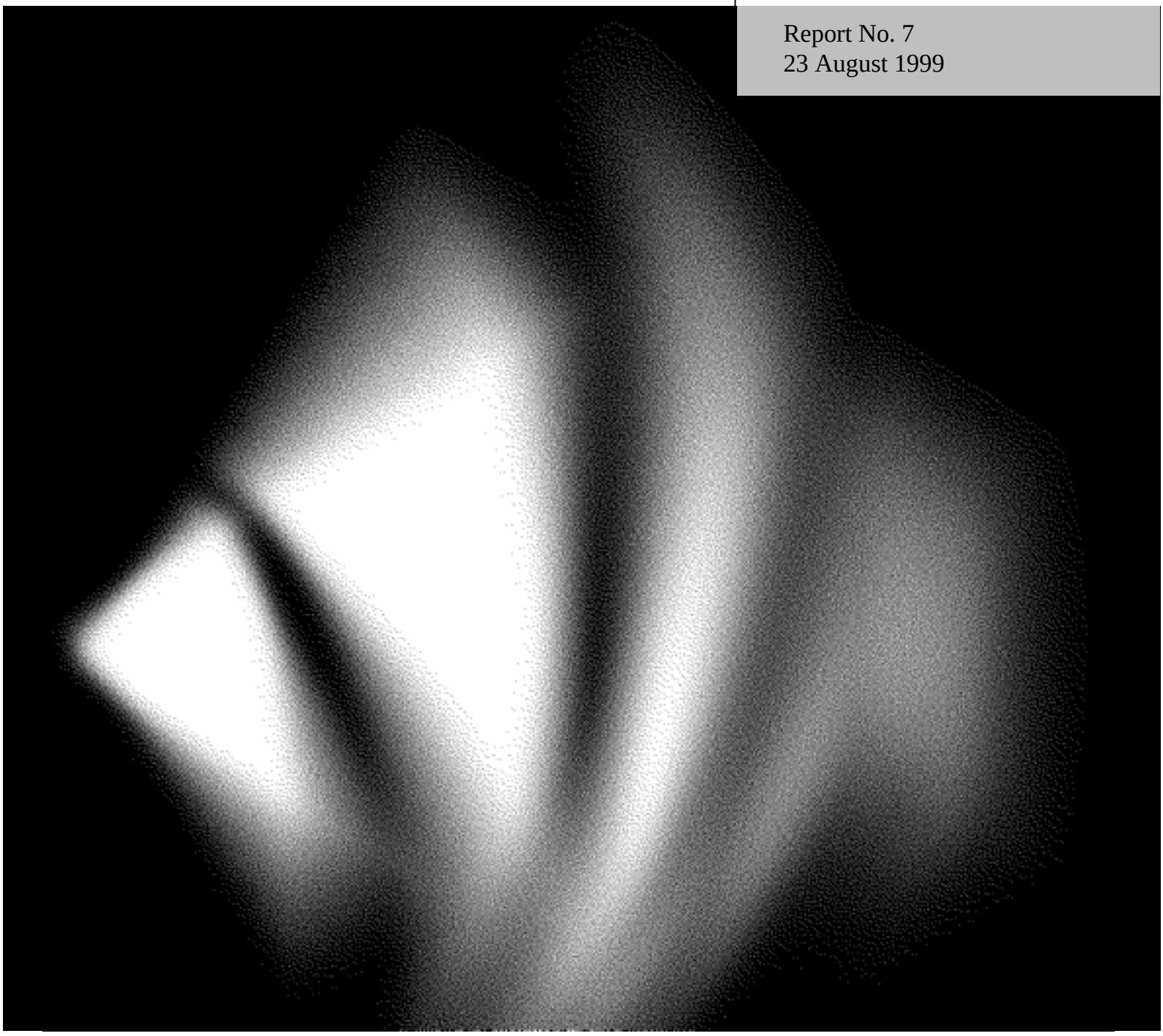
PRODUCTIVITY COMMISSION

International Telecommunications Market Regulation

Inquiry Report

Report No. 7
23 August 1999



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The Productivity Commission, an independent Commonwealth agency, is the Government's principal review and advisory body on microeconomic policy and regulation. It conducts public inquiries and research into a broad range of economic and social issues affecting the welfare of Australians.

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23 August 1999

Senator the Hon. Rod Kemp
Assistant Treasurer
Parliament House
CANBERRA ACT 2600

Dear Assistant Treasurer

In accordance with Section 11 of the *Productivity Commission Act 1998*, I have pleasure in submitting to you the Commission's report on *International Telecommunications Market Regulation*.

Yours sincerely

Mike Woods
Presiding Commissioner

Terms of reference

I, ROD KEMP, Assistant Treasurer pursuant to Parts 2 and 3 of the *Productivity Commission Act 1998* hereby:

1. Refer International Telecommunications Market Regulation for inquiry and report within six months of receiving this reference. The Commission is to hold public hearings for the purpose of the inquiry.
2. Specify that in making its recommendations, the Commission aim to improve the overall economic performance of the Australian economy.
3. In particular, request that the Commission examine and report on:
   (a) the various settlement arrangements which exist in the international telecommunications market (for example accounting rates and internet peering models) with a focus on any emerging arrangements in the international carriage services component of that market;
   (b) whether international agreements or asymmetric national policies concerning market conduct and market structure may give rise to distortions or mispricing of the above settlement arrangements, including a discussion of the welfare implications for representative market participants;
   (c) the competitive conduct and investment behaviour of Australian firms in the international telecommunications market both domestically and internationally (for instance their participation in global alliances and new infrastructure investment) and whether any linkages may be drawn with prevailing international settlement arrangements;
   (d) community benefits from reform of settlement arrangements, examining both the domestic and international components of the international telecommunications market, including:
      (i) benefits attributable to previous reform of settlement arrangements;
      (ii) benefits attributable to increased domestic competition, especially since 1 July 1997;
      (iii) potential benefits from further reforms; and
      (iv) any evidence on the effect of foreign policies on pricing and market access on Australian net traffic flows; and
   (e) options for reform, including those appropriate for consideration in the context of future GATS negotiations for telecommunications from the year 2000.

4. Specify that the Commission:

   (a) take account of any recent studies undertaken, including Australia's official involvement in international fora; and

   (b) have regard to the established economic, social and environmental objectives of the Australian Government.

ROD KEMP

23 February 1999

[reference received 23 February 1999]

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Abbreviations and explanations

Abbreviations

ABS	Australian Bureau of Statistics
ABT	(WTO) Agreement on Basic Telecommunications
ACA	Australian Communications Authority
ACCC	Australian Competition and Consumer Commission
APEC	Asia Pacific Economic Cooperation
ATM	Asynchronous Transfer Mode
ATUG	Australian Telecommunications Users Group
bps	bits per second
BT	British Telecom
DFAT	Department of Foreign Affairs and Trade
DOCITA	Department of Communications, Information Technology and the Arts
FCC	Federal Communications Commission (US)
GATS	General Agreement on Trade in Services
Gbps	Gigabits per second, or 1×10^9 bits per second
GDP	Gross Domestic Product
IC	Industry Commission
Inmarsat	International Maritime Satellite Organisation
INTELSAT	International Satellite Organisation
IP	Internet Protocol
IRU	Indefeasible Right of Use
ISP	Internet Service Provider
ISR	International Simple Resale
ITRs	International Telecommunications Regulations
ITU	International Telecommunications Union
Mbps	Megabits per second, or 1×10^6 bits per second

MFN	Most Favoured Nation
MIU	Minimum Investment Unit
OECD	Organisation for Economic Cooperation and Development
PC	Productivity Commission
PoP	Point of Presence
PSTN	Public Switched Telephone Network
TPA	*Trade Practices Act 1974*
TSLRIC	Total Service Long Run Incremental Cost
USO	Universal Service Obligation
VoIP	Voice over Internet Protocol
WTO	World Trade Organization

Explanations

Page reference numbers	The page reference numbers cited in this report are taken from printed copies held by the Commission. Because several submissions were originally received as electronic files, the cited page numbers may differ from page numbers in printed copies held by others.

Overview and findings

This report focuses on the reform of international telecommunications markets, in particular on the payment arrangements between providers of international telecommunications services. It examines possible inefficiencies associated with those arrangements, covers community benefits arising from recent reform and considers issues relating to future reform.

The Commission has concluded that the broad strategies adopted by Australia in pursuing international telecommunications reform are appropriate. Key findings are that:

- liberalisation of the Australian domestic telecommunications market has been central to reform of Australia's international telecommunications sector;
- similar domestic market liberalisation in other countries is of benefit to Australia; and
- Australia should continue to build strong bilateral and regional relationships to maximise its effectiveness in pursuing telecommunications reform in multilateral forums.

Background

International telecommunications markets in Australia and many other countries have been subject to rapid change during the last decade or so due to:

- regulatory reform aimed at market liberalisation, either unilaterally or under the auspices of the World TradeOrganization (WTO);
- rapid technological change which has driven down the underlying costs of existing services and enabled the provision of new services; and
- rapid growth in consumer demand, especially for the Internet.

However, not all governments support reform of the traditional payment arrangements for international telecommunications — their monopoly providers would face a significant loss of earnings from abroad — and some have been delaying the reform process. As a result, little has been achieved so far in the institutional reform of those arrangements.

Payment arrangements

Traditionally, payment by providers in one country to providers in other countries for most international telecommunications traffic has taken place under the *accounting rate system*. In brief:

- a per minute rate — the accounting rate — is agreed between a provider in one country and a provider in another;
- a settlement rate is then agreed, usually at half of the accounting rate;
- payment is made by one provider to the other, based on the *balance* of the traffic between them and the agreed settlement rate.

With the developments noted above, the basic premise underlying this system has lost much relevance. Modern international telecommunications are no longer limited to jointly provided services by monopolists in each country of a series of bilateral relationships. They are now traded in many different technical and commercial ways, often in contestable markets.

Indeed, many countries with liberalised markets have given telecommunications providers greater freedom than in the past to negotiate payment arrangements on a commercial basis. Thus, although the accounting rate system remains important on some routes, prices on many routes are increasingly being determined commercially. This includes payment for cable or satellite capacity, for interconnection (origination and termination) services and for the rapidly growing Internet.

Inefficient pricing

Agreed accounting rates were originally intended to represent the total costs of international calls, but underlying costs have declined rapidly and the gap between these costs and the accounting rates has widened. Further, Australia's total international outwards traffic under the accounting rate system has significantly exceeded inwards traffic. Thus, although the relative importance for Australia of the accounting rate system has declined, Australian providers have had to make payments to foreign providers for the balance of traffic under the system at rates which greatly exceed costs.

There is also evidence of inefficient pricing (that is, of prices exceeding underlying costs) for the services now provided outside the accounting rate system. For example, access to international cable capacity has at times been difficult to obtain, and then only at high prices (although this could change with a planned massive expansion in cable capacity). Charges for interconnection to the local loop continue

to significantly exceed underlying costs in some markets, including Australia. For international Internet traffic, Australian providers at present pay for both inwards and outwards traffic with the United States.

Competitive conduct and investment behaviour

It is difficult to link the competitive conduct and investment behaviour of international telecommunications providers directly to the inefficiencies inherent in past and existing payment systems. Nevertheless, there is considerable evidence that providers adopt strategies to minimise the adverse effects of payment systems, and continue to exploit available market power. The opportunities have been expanded by the recent liberalisation of telecommunications markets in many countries, coupled with technological change.

Australian providers seek to minimise costs by, for example:

- changing the routing of traffic to take advantage of arbitrage opportunities;
- forming alliances with foreign providers to give an end-to-end service; and
- investing in facilities in other countries.

Although these strategies can reduce the costs imposed on Australian providers, and provide some community benefit, greater benefits would be obtained by reform of the payment arrangements themselves, coupled with further liberalisation of domestic telecommunications markets.

The competitive conduct of foreign providers could also disadvantage the Australian community. Here also, continuing liberalisation of telecommunications markets would bring benefit through reducing opportunities for anti-competitive behaviour.

Benefits from reform

Australia commenced reform of domestic telecommunications as far back as 1975. Liberalisation progressed much further in July 1997 when a new telecommunications regulatory regime — intended to promote the long term interests of end users and the efficiency and international competitiveness of the Australian telecommunications industry — came into effect. These changes facilitated competition in the Australian market, and opened up access to foreign providers.

Australia has been engaged also in seeking reform through the WTO and the International Telecommunications Union (ITU). Some progress has been made, but further liberalisation of domestic markets and reform of payment systems is needed.

So far, the reform process has brought worthwhile benefits for Australia. These include reductions in accounting rates and consumer charges, growth in telecommunications traffic, greater freedom for providers to invest in other countries and to establish alliances, and a growing supply of international cable capacity.

Measuring these benefits poses considerable difficulties. However, most of the revenue loss to Australia from high accounting rates (tentatively estimated at some $108 million for 1995-96 at the provider level) may have already been eliminated. This is mainly because of the marked decline — facilitated by the reform process — in the relative importance of the accounting rate system for Australian international telecommunications traffic.

In regard to the possible future benefits from reform, it is noted that:

- an excess price in the order of 2–3 cents per minute may apply in Australia to interconnection withTelstra's domestic network;
- on a per minute equivalent basis, an excess price of over 10 cents may apply on leased lines for international traffic; and
- in regard to Internet traffic with the United States, Australian providers bear a total excess cost of about $45–72 million per annum.

Although these estimates may appear small in absolute terms:

- they are important relative to the size of the international telecommunications sector;
- unless matched by price reductions, the potential gains will increase as underlying costs continue to fall;
- the estimates do not capture all remaining inefficiencies; and
- the estimates are based on current traffic volumes. As traffic volumes are increasing rapidly — for example, Internet traffic is doubling each year — the potential gains will also increase rapidly.

Further, these estimates are likely to understate the benefits which could be obtained at the consumer level through efficient pricing.

Findings

- The traditional accounting rate system for international telephony has significantly declined in importance in recent years. There is increasing scope for commercial negotiation between providers, with prices determined on the basis of the services required.
- Accounting rates for international telecommunications traffic to and from non-liberalised countries remain well above underlying costs.
  - Australia could increase pressure for reform through negotiation with other countries in the ITU to extend endorsement of alternative calling procedures and to seek removal of categories of international traffic, such as that originating or terminating on mobile networks, from the accounting rate system.
- There is evidence of inefficient pricing for some services between liberalised markets, including the Internet.
  - The relative importance of domestic interconnection in the total costs of international telecommunications continues to grow. The work of the ACCC should ultimately result in a better alignment of interconnection prices with underlying costs.
  - There is a potential anomaly in levying a Universal Service Obligation contribution on international satellite operators, but not on international cable consortia.
- It is difficult to link the market conduct and investment behaviour of international telecommunications providers directly to the inefficiencies inherent in past and existing payment systems. There is considerable evidence, however, that providers adopt strategies that minimise the adverse effects of those systems and that they continue to exploit remaining market power.
- While individual providers adopt strategies to reduce the costs imposed on them by inefficiencies in payment arrangements, greater benefit to the community would be obtained by reform of the payment arrangements themselves and further liberalisation of markets.
- Although the available estimates of the losses arising from inefficiencies in payment arrangements appear relatively small, they are likely to underestimate the full benefits which could be obtained from current and future reform.
  - The potential benefits from reform would be more visible if the ACCC included more services in the scope of its annual public report on telecommunications charges paid by consumers and also published

information about the underlying costs making up the elements of international telecommunications services.

- The broad strategies adopted by Australia in pursuit of telecommunications market reform in general, and of reform of international telecommunications payment arrangements in particular, have been appropriate. They include:
  - liberalising the Australian domestic telecommunications market;
  - pursuing liberalisation of domestic markets of other countries through the WTO;
  - following through on the commitment of WTO members to take up reform of the accounting rate system in forthcoming negotiations;
  - seeking a commercially negotiated cost-based pricing approach to international telecommunications and its various service components, including originating and terminating interconnection;
  - continuing to seek reform through the ITU;
  - building strong bilateral and regional relationships to maximise Australia's effectiveness in multilateral forums; and
  - pursuing reform of Internet charging arrangements in an international context.

1 Introduction

1.1 Scope of the inquiry

The Commonwealth Government has asked the Commission to inquire into international telecommunications market regulation. In particular, the Commission has been asked to report on:

- the various settlement arrangements which exist and are emerging in the international telecommunications market;
- whether international agreements or asymmetric national policies concerning market structure and conduct give rise to distortions or mispricing of the settlement arrangements;
- the competitive conduct and investment behaviour of Australian firms in the international telecommunications market, both domestically and internationally;
- community benefits from reform of the settlement arrangements; and
- options for reform.

The Commission has interpreted 'settlement arrangements' broadly to include all payment arrangements between providers of international telecommunications services, not just the traditional accounting rate system applying to international telephone calls.

In undertaking the inquiry, the Commission has been asked to have regard to the Government's established economic, social and environmental objectives. In addition, the Commission's general policy guidelines require it, amongst other things, to recognise the interests of the Australian community generally. Thus, although the inquiry focuses on payment arrangements between providers in relation to international telecommunications traffic, the effects of those arrangements on consumers, such as businesses and households, and on the community as a whole are also relevant.

Aspects of domestic regulation particularly relevant to international telecommunications are covered in the inquiry.

The terms of reference are set out at the beginning of the report on pages V and VI. The Commission was asked to submit its final report by 23 August 1999.

A separate National Bandwidth Inquiry is currently being undertaken by the Australian Information Economy Advisory Council. The Commission has endeavoured to minimise duplication of the work of that inquiry, which is due to report by October 1999.

1.2 The inquiry context

Over the past decade, international telecommunications markets in Australia and in other countries (such as the United States and the European Union) have been subject to rapid change.

Market liberalisation

Regulatory reform aimed at achieving market liberalisation has been of major significance. Under the World Trade Organization (WTO) 1994 General Agreement on Trade in Services and the 1997 Agreement on Basic Telecommunications, many countries have scheduled commitments to market access (ie the opening of domestic markets to foreign providers), national treatment (treating domestic and foreign firms equally) and pro-competitive regulation for 'basic telecommunications' (for more details see section 3.1). This includes voice telephone, telex, telegraph and private leased circuit services.

For some countries — including the United States, the United Kingdom, New Zealand and Australia — these agreements lock in existing unilateral reforms. For others, they imply substantial additional market liberalisation. Box 1.1 provides a summary of Australia's reforms and describes the key features of the existing regulatory arrangements.

Despite progress so far, many countries still have some way to go before their markets are as liberalised as Australia's. These countries typically have significant restrictions on market access, including monopoly supply of services and barriers to foreign equity in domestic providers. These remaining restrictions are likely to be addressed in the next round of WTO services negotiations which is due to commence by 1 January 2000.

Box 1.1 **Regulation of Australia's telecommunications market**

Significant changes to Australia's telecommunications regulatory environment have been implemented as far back as 1975 when Telecom was formed out of a government department, initially with full government ownership and with a statutory monopoly on the supply of telecommunications services. A number of liberalising changes were subsequently made, including:

- corporatisation, giving Telecom (now Telstra) a more commercial focus and establishing AUSTEL, an independent regulator;
- increasing competition, first in the form of alternative suppliers of customer premises equipment and value added services, and later in the network from Optus, a second licensed network carrier; and
- privatisation — the domestic satellite operator, AUSSAT, was sold to Optus, complete with a network licence.

On 1 July 1997, a new telecommunications regulatory regime came into effect in Australia which is intended to promote the long term interests of end users and the efficiency and international competitiveness of the telecommunications industry. Key features of the new regime are as follows.

Carriers and carriage service providers

- The owner of a network unit used to supply carriage services to the public must hold a carrier licence granted by the Australian Communications Authority.
- There is no limit on the number of carrier licences which can be issued. Carrier licence conditions impose obligations to contribute toward the cost of universal service obligations, fulfil industry development plans and comply with telecommunications access regulation.
- A carriage service provider supplies a telecommunications service to the public using network facilities owned by a carrier. Carriage service providers are not required to be licensed, but have many of the same obligations as carriers.

Competition safeguards

- The telecommunications industry is subject to general competition law specified in Part IV of the *Trade Practices Act 1974,* as well as industry specific rules under that Act, administered by the ACCC, in relation to anti-competitive conduct and telecommunications access (see below).
- The ACCC may issue a competition notice where it considers a carrier or carriage service provider to be engaging in anti-competitive conduct.
- Under provisions of the *Telecommunications Act 1997*, the ACCC may respond to anti-competitive conduct by international telecommunications operators (see box 4.6).

(Continued on next page)

Box 1.1 **(continued)**

Telecommunications access

- The ACCC may declare services subject to telecommunications access rules.
- Where services are declared, providers must comply with their access obligations: on commercially agreed terms and conditions; as detailed in an access undertaking accepted by the ACCC; or as determined by the ACCC through arbitration when the parties cannot agree.
- The Telecommunications Access Forum is required, among other things, to draft an access code setting out model terms and conditions.

Price control arrangements

Telstra is subject to a number of price control arrangements. For example, under revised controls taking effect on 1 July 1999, a CPI minus 5.5 per cent price-cap applies to a basket of eight of Telstra's services: connections, line rentals, local, trunk and international calls, domestic and international leased lines and digital cellular mobile. Other price-caps also apply.

Privatisation of dominant carrier

One-third of the equity in Telstra was sold in 1997, with a further equity sale to be completed later in 1999. This will bring private ownership to about 49.9 per cent.

Source: DOCITA (website at http://www.dcita.gov.Australia); IC (1997b).

Market-based changes

In addition to these regulatory reforms, there have been significant market-based changes. Rapid technological change has driven down the underlying costs of providing telecommunications services, including international telecommunications services. Examples include the digitalisation of many services (including voice traffic), optical transmission and the continuing development of compression and multiplexing techniques. These have enabled the volume of traffic sent along cables and through satellite systems to be increased many times over.

A second significant market-based change is the rapid growth in consumer demand, particularly for data services and those provided over the Internet. This growth in demand has, in turn, sparked investment in new network capacity, for example in international submarine cables and in satellites.

Pressures on payment arrangements

Liberalisation of markets, technological change, and growth in demand have contributed to pressures on the payment arrangements between providers of international telecommunications services.

The traditional *accounting rate system*, in particular, has been under severe pressure. Under this system:

- a per minute rate — the accounting rate — is agreed between a provider in country A and a provider in country B;
- a settlement rate is then agreed, usually at half the accounting rate; and
- payment between the providers is based on the *balance* of the traffic between them at the agreed settlement rate.

The system, and the pressures undermining it, are described in more detail in chapter 3, with its economic effects analysed in chapter 4. A particular problem with the system is that the agreed rates of payment have been usually well above the underlying costs of providing international telecommunications.

Many countries with liberalised markets, including Australia, New Zealand, the United States and the United Kingdom, now permit their telecommunications providers to negotiate payment terms and conditions on a more commercial basis than in the past. Nevertheless, although the situation is changing rapidly, the accounting rate system still applies to a significant volume of international traffic, particularly to and from non-liberalised markets.

Despite the changes now permitted in some liberalised markets, to date there has been little internationally coordinated institutional reform of the accounting rate system although:

- in June 1999, Study Group 3 of the International Telecommunications Union — the multilateral organisation of 188 government and private sector members responsible for its development — approved a recommendation designed to permit alternative methods of remunerating providers (see appendix A for more detail about the ITU and its activities);
- the ITU is also currently considering proposals to phase settlement rates down closer to cost-based target levels; and
- the US Federal Communications Commission has unilaterally capped the settlement rates that US providers can pay to foreign providers (also see appendix A).

There are pressures in other areas of payment as well. For instance, there is growing pressure to free up access by providers to international cables and for interconnection rates (for connecting international and domestic networks) to be aligned more closely to underlying costs.

Payment arrangements applying to Internet traffic, including the arrangements between US and non-US Internet service providers (ISPs), are also coming under pressure. A concern of providers outside the United States is that the cost of international Internet capacity is not shared equitably. International attention is currently being given to the question of Internet pricing by groups such as the telecommunications working group of the Asia Pacific Economic Cooperation forum.

This inquiry has provided the opportunity for a public review of progress in reforming international telecommunications in the context of the recent developments outlined above.

1.3 Consultation

To facilitate participation in the inquiry and to allow the maximum degree of public scrutiny in the six months specified by the Assistant Treasurer, the Commission:

- held informal discussions with 15 groups with varied interests and perspectives;
- released an Issues Paper to assist those wishing to make written submissions;
- invited written submissions — 20 submissions were received from providers and users of international telecommunications, peak organisations and government agencies;
- released a Position Paper in June 1999 setting out preliminary options; and
- conducted a public hearing in Sydney on 21 July 1999 to receive feedback on the Position Paper.

Appendix B lists the names of organisations and individuals who have participated in the inquiry.

The Commission expresses its appreciation to those who provided written submissions to a firm deadline, or gave freely of their time to discuss inquiry issues.

1.4 Report structure

Chapters 2 and 3 of this report set out background information about the international telecommunications market and payment arrangements. Chapter 4 analyses inefficiencies in payment arrangements, while chapter 5 looks at quantifying the benefits of reform. Chapter 6 discusses issues and options for reform.

2 International telecommunications market

Australia is a relatively small participant in the international telecommunications market. For example, in 1997, outgoing traffic from Australia made up only 2.2 per cent of outgoing traffic minutes from OECD countries (OECD 1999, p. 61). Further, international telecommunications services account for only a relatively small part of the Australian economy, comprising around 0.3 per cent of GDP in 1997 (OECD 1999, p. 60).

Nevertheless, international telecommunications services are important to many Australian households and businesses. For households, these services facilitate social and family ties between countries while for businesses, international telecommunications services are vital in facilitating trade, and are an input for a wide range of industries. DFAT considered that 'the cost of international telecommunications, whether by phone, fax or via the Internet, is an important determinant of Australian exporters' international competitiveness ...' (sub. 11, p. 1). As an input for the services industries, total telecommunications makes up 5 per cent of costs (ABS 1997). Telecommunications plays a lesser role in manufacturing, mining, agriculture, forestry and fishing, where it makes up between 1 and 2 per cent of costs.

In addition, growth in telecommunications contributes to growth in services trade in its own right. Exports of communications (of which telecommunications forms the major part) grew at an annual average rate of 19 per cent in the four years to 1997-98, contributing to a growth figure for services trade of 9.5 per cent over the same period (sub. 11, p. 1).

The importance of international telecommunications is likely to continue to increase in the future, especially with rapid growth of the Internet and electronic commerce.

2.1 Describing the market

International telecommunications services are provided by way of networks of country-to-country satellite and cable links, together with domestic infrastructure in the sending and receiving countries (more details are given in IC 1997a and 1997b).

The international telecommunications market can be described in a number of ways, including the following:

- Services provided. Examples are telephone calls and facsimile services, email, data, video and Internet access.
- Technology employed in transmitting information (some commonly used technologies are explained in box 2.1). In this regard, however, DOCITA commented that 'Technical advances, particularly digitalisation, are rapidly undermining the assumptions that associate particular services with particular technologies' (sub. 6, p. 15). For example, a telephone call can be provided either over traditional circuit switched links or over the Internet, using Internet Protocol (box 2.2).
- Payment arrangements between providers (these arrangements are explained in more detail in chapter 3). In brief, these arrangements include:
  - the traditional accounting rate system and recent variants;
  - payment for the individual facilities used in service provision, such as international leased lines and interconnection to domestic markets; and
  - payment for Internet traffic.

The rest of chapter 2 presents information about international traffic volumes, Australian providers and consumers, and recent trends in consumer prices.

2.2 Traffic volumes

Data relating to the international telecommunications market are generally incomplete and sometimes contradictory. This is partly a result of Australia's light handed regulatory approach to telecommunications — to date only limited information about the market has been collected by official bodies and/or has been required to be published (see section 6.6 in chapter 6 for some comments on future information reporting). Nevertheless, some indicators of trends are available.

Box 2.1 **Common telecommunications technologies**

Analogue signals: Signals by which information (such as voice or data) is conveyed using continuously varying amplitude (strength) and frequency (tone). In contrast to digital.

Digital signals: Signals by which information is conveyed by way of discrete values (one or zero) which vary in time.

Channel: A path along which signals can be sent between two or more points.

Circuit switching: Temporary direct connection between two or more points in order to provide the users with exclusive use of an open channel with which to exchange information. A continuous circuit path is set up between the sender and receiver, in contrast to many forms of packet switching, in which no such continuous path is established.

Packet switching: Messages sent across a network are broken up into a series of separate 'packets' each containing a small portion of the original message. Packets are then sent across the network to their destination. Depending on the transmission protocol, each packet may travel a different route and arrive at different times. Upon arrival all packets are re-assembled into their original message.

Asynchronous Transfer Mode (ATM): An international packet switching standard using a cell based approach in which each packet of information features a uniform size of 35 bytes. All packets take identical routes to their eventual destination through a 'virtual' circuit. ATM has the advantage of smaller packet sizes and less destination address information than some other packet switching standards. This results in faster speeds in the switching process.

Frame relay: A high speed (up to 45 Mbps) packet switching protocol used in wide area data networks.

A leased line: A 'leased line' is the lease of a specified amount of cable capacity for a specified period. It generally provides a physical or virtual circuit to the user.

Transmission Control Protocol (TCP): TCP and IP (Internet Protocol) are the dominant communication protocols on today's Internet. TCP enables two machines to transmit data back and forth in a manner transparent to the operating system of each. It defines the handling of packets, including segmentation, reassembly, connection, separation and recovery of lost packets.

Internet: The Internet is a worldwide 'network of networks', interconnected by routers and common communications protocols (TCP/IP). Although the Internet backbone (large national networks) and other networks are often provided over the same lines as traditional telephone networks, the traffic from each network is fundamentally different. Whilst Internet traffic is packet switched, traditional telephone traffic is circuit switched. From the consumer perspective, common uses of the Internet include electronic mail (email) and the World Wide Web.

Source: Derived from APEC (1999); Budde (1999b, p. 3); McKie-Mason and Varian (1997); Nelson (1998, pp. 448, 465); OECD (1999 p. 93); PC (1999, pp. xv, xvii).

Box 2.2 **Traditional voice traffic and Voice over Internet Protocol (VoIP)**

Voice traffic can be carried from sender to receiver by various technologies, including traditional telecommunications links and Internet Protocol.

Traditional international telephone voice traffic is usually carried from a domestic sender to the international gateway in the domestic country via the local (and often the domestic long distance) Public Switched Telephone Network (PSTN). The PSTN provides the basic infrastructure for telecommunications services, and is available to all users. Traffic is carried to the international gateway of the destination country and is then carried to its final destination by the PSTN of the foreign country. All of this is circuit switched — a dedicated channel of agreed bandwidth is established between the sender and the receiver for the period of the call.

Voice over Internet Protocol (VoIP), a packet switched service, involves the provision of voice calls using the Internet Protocol (IP). A protocol is a set of rules for computers to follow when communicating with each other. Standard protocols allow computers from different manufacturers using different software to communicate effectively. IP provides a unique 32-bit address for each machine connected to a network, and handles addressing and forwarding of packets of data.

Although IP is one of the dominant protocols on today's Internet, it can also be used on public and private networks. Similarly, VoIP can be provided over the Internet, or through other public or private networks.

Source: Derived from APEC (1999); OECD (1999); PC (1999).

Telstra estimated that total international PSTN traffic (that is, circuit switched traffic carried over infrastructure that is available to all users) to and from Australia has been growing strongly in recent years (table 2.1). Over the period from 1995-96 to 1998-99, outgoing PSTN traffic increased by 21 per cent (approximately 7 per cent annually), and incoming traffic by 40 per cent (12 per cent annually).

Table 2.1 **Telstra's estimate of international PSTN traffic from and to Australia, 1995-96 to 1998-99 (millions of minutes)**

Direction of traffic	*1995-96*	*1996-97*	*1997-98*	*1998-99*[a]
From Australia	1150	1316	1365	1393
To Australia	944	1090	1219	1319

[a] Annualised estimate based on data to April 1999.

Source: Telstra (sub. 4, p. 4).

In the past, international PSTN traffic from and to Australia has largely been settled through the accounting rate system. For instance, in 1997, around 80 per cent of total telephony traffic between Australia and the United States was settled according to the accounting rate system (see table 3.2 in chapter 3). However, Telstra

indicated that, over time, providers have moved away from the accounting rate system to more commercially focused arrangements, such as one-way prices agreed by both parties and one-way prices set by destination. Such arrangements now cover approximately 80 per cent of Telstra's current total business (sub12, p. 1). Global One also stated that other forms of payment have become more prevalent:

> Australian carriers can now employ [wholly] owned circuits, IPLs/ISR [International Private Lines/International Simple Resale, where providers switch international traffic onto leased whole circuits] or cost based settlement rates on such routes. (Sub13, p. 2)

It is predicted that international PSTN traffic will continue to increase in absolute terms although, as later discussed, its share of overall international traffic will decrease. Ovum (1998, p. 250) estimated that outbound Australian PSTN traffic will increase by about 170 per cent over the period from 1998 to 2008. A continuing decline in charges, a high elasticity of demand and ongoing globalisation of economies were expected to be major factors generating this traffic growth.

The most important destinations for Australian outgoing PSTN traffic are the United Kingdom, New Zealand and the United States (table 2.2). A number of Asian countries are also important traffic destinations. Data for previous years (up-to-date aggregate data are not available) show that, for incoming traffic, the United Kingdom, New Zealand and the United States are again the most important.

Table 2.2 **PSTN traffic from Australia, 1997-98**

Country	*Per cent*
United Kingdom	15
New Zealand	12
United States	11
Singapore	4
Hong Kong	4
Japan	3
Canada	3
Malaysia	3
Indonesia	3
China	3
Rest of World	40
Total	**100**

Source: TeleGeography (1998, p. 159).

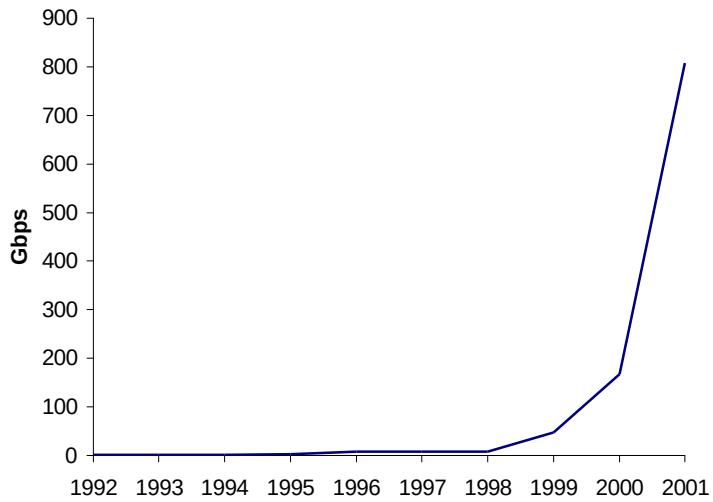
Given its market position, Telstra's top three traffic destinations and sources mirror those for Australian providers as a whole. Telstra's 1998 annual report states that, for 1997-98, the three main destinations of Telstra's international calls were the United Kingdom (19 per cent of outgoing minutes), New Zealand (15 per cent) and

the United States (13 per cent). The three main sources of Telstra's international calls were the United States (23 per cent of incoming minutes), New Zealand (19 per cent) and the United Kingdom (17 per cent).

Despite the continuing growth of international PSTN traffic, other types of traffic including international data traffic, Internet traffic and international simple resale have been increasing at a faster rate. Where payments are made between providers for these types of traffic, they are generally on the basis of the facilities used: for example, the lease of private lines and the provision of interconnection services.

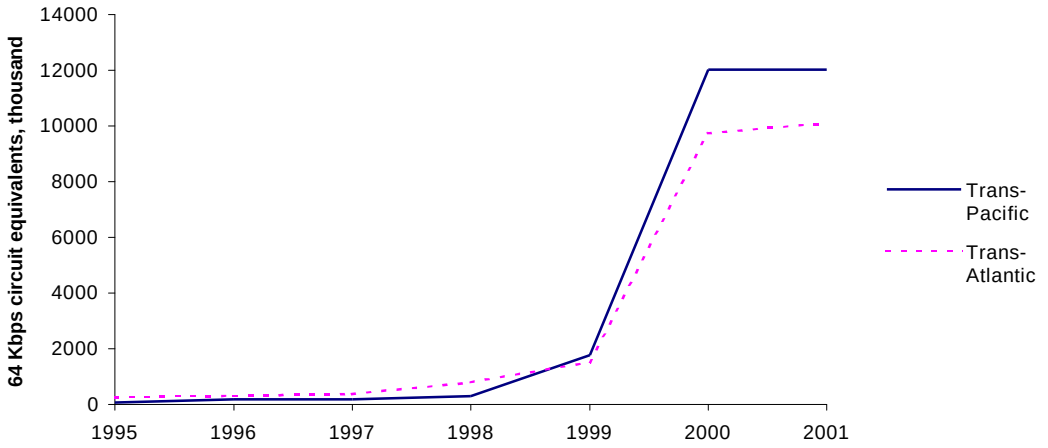
Although a comprehensive measure of the total volume of such traffic is not available, the total capacity of international cable and satellite links is expected to increase much more rapidly than the PSTN traffic component, for Australia and globally. This suggests major growth in non-PSTN traffic. Planned capacity out of Australia could increase markedly in 2001 (figure 2.1), mainly due to the 640 Gbps Australia-Japan link planned by Telstra. Total capacity crossing the Pacific and Atlantic oceans is set to increase substantially in 2000 (figure 2.2).

Figure 2.1 **International digital cable capacity out of Australia, 1992 to 2001**



Data source: ICPC (1999); Telstra (sub. 4, p. 4).

Figure 2.2 **International cable capacity crossing the Pacific and Atlantic oceans[a], 1995 to 2001**



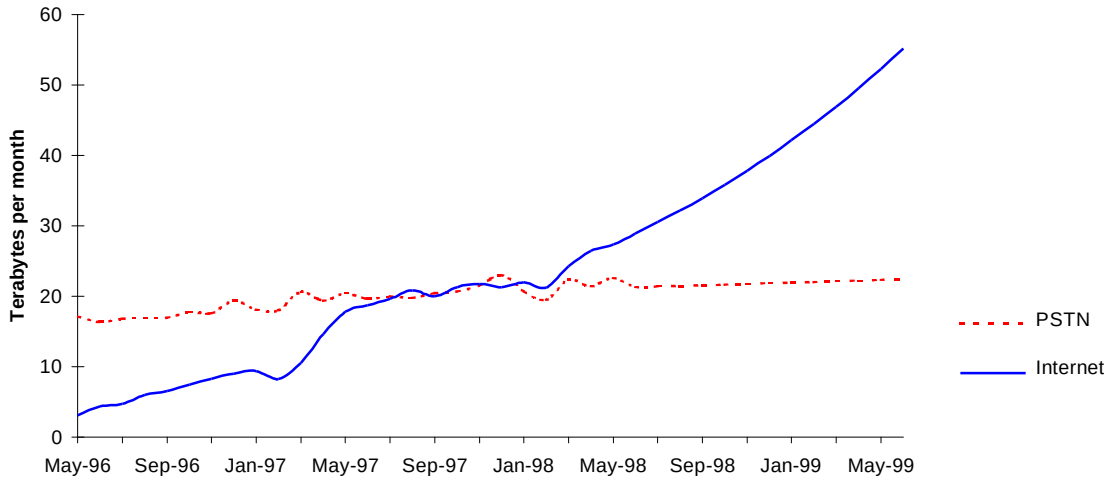
a Does not include cables such as Telstra's 640 Gbps cable link between Australia and Japan planned for 2001 (which causes the sharp rise in planned capacity for 2001 in figure 2.1).

Data source: FCC quoted by Telstra (sub. 4, p. 4).

Internet

Internet traffic is increasing at a rapid rate and has become the predominant form of traffic on many routes. For Telstra's international routes, Internet traffic has been consistently greater than PSTN traffic since early 1998 (figure 2.3).

Figure 2.3 **Telstra's international PSTN and Internet traffic[a]**



a Data after 30 June 1998 are Telstra forecasts.

Source: Telstra (sub. D18, p. 2).

According to Telstra, the majority of Australian international Internet traffic is imported into Australia, although the proportion of exported traffic is increasing over time (table 2.3).

Table 2.3 **Australian international Internet traffic (terabytes)**

Direction of traffic	*1995-96*	*1996-97*	*1997-98*	*1998-99*[a]
Outgoing	10	125	325	595
Incoming	40	235	555	860

a Annualised estimate based on data to April 1999.

Source: Telstra (sub. 4, p. 5).

Although it is difficult to track Internet traffic flows by source or destination, some indicators are available. Telstra estimated that, of the Australian Internet traffic that is carried over international links, 86 per cent of foreign originating traffic is sourced from the United States, and 64 per cent of Australian originating traffic is destined for the United States (table 2.4). The data in tables 2.3 and 2.4 together suggest that, in absolute terms for 1998-99, some 740 terabytes originated in the United States destined for Australia, and 380 terabytes originated in Australia destined for the United States.

Table 2.4 **Estimated origin and destination of Australian Internet traffic, 1999**

Region	*Origin of traffic (per cent)*	*Destination of traffic (per cent)*
US	86	64
Europe	6	13
Asia	4	14
Other	3	9

Source: Telstra (sub. 4, p. 5).

Because of the significance of US traffic, Telstra's Internet capacity to the United States far outweighs its capacity to any other country (table 2.5).

Table 2.5 **Telstra's Internet network deployment, 1999**

Country	*Mbps*
US	363
Asia	26
NZ	16
Total	**405**

Source: Telstra (sub. D17, p. 1).

2.3 Australian providers

Deregulation of the Australian telecommunications market in July 1997 signalled the end of the duopoly in the provision of fixed line carrier services (Telstra and Optus), and the three provider mobile services market (Telstra, Optus and Vodafone). By August 1999, the number of carrier licences had increased to 31 (although some providers have more than one licence). These carriers are able to provide international telecommunications services, although not all presently do so.

A provider does not have to be licensed as a carrier to own or lease switching facilities or international cable circuits. In mid-1999, as well as licensed carriers, there were about 80 other providers of telecommunications services and more than 600 Internet service providers. The vast majority were not involved directly in the provision of international telecommunications services.

Several of the new entrant licensed carriers and service providers are the Australian subsidiaries or affiliates of foreign telecommunications companies. These include:

- AT&T Australia Ltd (United States);
- BT Australasia (United Kingdom);
- Kokusai Denshin Denwa Co Ltd (KDD) (Japan);
- MCI International Australia Ltd (United States);
- NTT (Nippon Telegraph and Telephone) Australia Ltd (Japan);
- Singapore Telecom (Singapore);
- TMI Australia (Telecom Italia) (Italy);
- Telecom New Zealand (New Zealand); and
- Teleglobe Australia Pty Ltd (Canada).

Although Telstra has lost international PSTN market share since July 1997, it remains the dominant provider at the Australian end of that market. Prior to July 1997, Telstra sent around 70 per cent of outgoing international PSTN traffic (at the carrier level) from Australia to the rest of the world and terminated 73 per cent of incoming traffic, with Cable & Wireless Optus sending and receiving the remainder. Since then, Telstra's share of international PSTN traffic has fallen around ten percentage points for both outgoing and incoming minutes. This market share loss, however, has been offset by growth in demand, so that the number of minutes sent and received by Telstra has increased (Telstra1998).

In regard to the Internet, Telstra receives and sends over three-quarters of the international traffic to and from Australia (Budde 1999a, p. 3). Other international traffic providers include Cable & Wireless Optus, AAPT, and OzEmail. As noted above, Internet traffic has been growing very rapidly.

Investment and alliances

There is a trend towards consolidation in the international telecommunications market. Mergers and acquisitions, as well as joint ventures and alliances, are leading to fewer operators with larger market shares. Telstra stated:

> The trend towards large international telecommunications mergers and alliances, and more recently 'mega-mergers', is significant. It is becoming a growing feature of the current international telecommunications market that major companies compete and grow by mergers and acquisition. (Sub.4, p. 7)

Factors driving the trend toward fewer providers include:

- a reduction in barriers to trade in international telecommunications;
- converging technologies;
- the ability to offer uniform cross border services to business customers, in particular multinational corporations;
- scale economies in billing and administration; and
- the need to increase foreign market share in response to increasing domestic competition from smaller operators providing specialist services.

Some reports predict rapid and radical consolidation of the world's major providers down to between 5 and 10 superproviders in three years (Lowe 1999, p. 8c). Rationalisation is also expected in the Australian telecommunications industry — a survey of telecommunications executives predicted the long term survival of only 5 carriers, 23 other providers of telecommunications services and 35 Internet service providers (Deloitte Touche Tohmatsu 1998, p. 13).

The major global telecommunications alliances as at August 1999 were as follows:

- AT&T and BT Concert;
- MCI and WorldCom;
- Infonet/Unisource;
- Global One; and
- WorldPartners.

These alliances, company groups with worldwide interests such as Cable & Wireless, and internationally connected providers such as Equant and SITA, provide end-to-end services, typically to large business customers such as multinational corporations. Such traffic normally takes place outside the traditional accounting rate system.

According to Telstra (sub. 4, p. 2), foreign carriers have set up in Australia in various ways, including:

- full or partial acquisition of equity in Australian telecommunications companies; and
- establishment of 'points of presence' (PoPs) in the major metropolitan centres to service both retail and wholesale customers.

Australian providers also invest in other countries. For example, Telstra has established points of presence in the United States, the United Kingdom and New Zealand. Box 2.3 summarises Telstra's global strategy.

2.4 Australian consumer demand

Nature of demand

There are several key features of the demand for telecommunications (including international telecommunications) services which distinguish it from the demand for many other goods and services.

One feature is that the consumption of telecommunications services (in common with other network facilities-based activities) requires access to the telecommunications network. Access gives consumers benefits from actually using the network, as well as benefits when the network is not used. For example, a consumer may benefit from an*option* to make an emergency call, even though he or she does not actually make the call.

Another feature is that telecommunications services are rarely consumed in isolation. For example, the connection of additional consumers to the network benefits existing consumers because the number of telephones (and the like) that can be reached is increased and, where a consumer makes a call or sends an email, another party — the receiver — is affected.

A third feature of telecommunications demand is that it is expressed in many forms such as by time of day (peak or off-peak), distance and volume (number of minutes or bytes).

Box 2.3 **Telstra's global strategy**

Telstra's goal is to be a globally significant communications company, facilitating seamless delivery of products and services to both wholesale and corporate customers. Telstra already has widespread network capability through cable and satellite agreements and equity agreements with global communications consortiums. To further its global service network, Telstra plans to increase its switching points of presence around the globe. The company's international and wholesale businesses have been identified as two key areas for future growth.

Some international investments by Telstra are listed below.

- Invested US$171 million under a ten year partnership with the Vietnamese Government carrier, VNPT, to upgrade Vietnam's international network. More investment is expected in Vietnam as Hanoi recently became a Telstra regional headquarters. Telstra also has a similar contract to upgrade the international network of Cambodia.
- Owns 60 per cent of a joint venture, Mobitel (Private) Ltd, which operates a digital mobile telephone network in Sri Lanka.
- Launched India's first meshed satellite based voice and data network as part of Telstra Vishesh Communications Ltd, a joint venture with India's VSNL. Telstra is also building a network management system for the Indian Government.
- Looking for a buyer for its 20 per cent stake in Mitra Global Telekomunikasi Indonesia (MGTI), formed to install phone lines for the Indonesian Government. Telstra has written down the value of its $60 million investment in MGTI to zero. It has a $42 million exposure to the project relating to performance requirements.
- Spending $50 million over the next three years to extend its Internet backbone into the Palo Alto Internet exchange in the United States, to give greater control over Internet routing and reliability. Involves adding 45Mbps of both way fibre capacity to the United States and New Zealand, and establishing a joint Internet router at the Palo Alto Internet exchange with the other members of APIC (Asia-Pacific Internet Community) — Dacom Corporation (Korea), KDD Corporation (Japan), Cable and Wireless HKT (Hong Kong) and Singapore Telecom.
- Planning a 640 Gbps international cable between Australia and Japan with nine other regional companies — China Telecom, Chunghwa Telecom (Taiwan), Cable & Wireless HKT (Hong Kong), Japan Telecom, Korea Telecom, KDD Corporation, NTT WorldWide Networks (Japan), Singapore Telecom and Telekom Malaysia.

Source: Derived from Banaghan (1999); Butler (1999); Corben (1999); Riley (1999); Telstra (1998, 1999a, 1999b, sub. 4, sub. D16).

Responsiveness of demand to price changes

Studies of the responsiveness of demand to changes in price (or the price elasticity of demand) for certain types of telecommunications services were reviewed in an Industry Commission staff paper (IC 1997b, chapter 3). The studies, which focused on telephone calls, generally found that prices have a greater influence on the consumption of international calls than for long distance or local calls. In Australian studies, the price elasticity of demand for international calls was greater than one — this means that an increase (decrease) in price would result in a more than proportionate decrease (increase) in the quantity demanded. Moreover, the studies found that residential users are more responsive to price than business users, and more responsive in the off-peak than the peak periods.

Level of consumer expenditure

The average spending of an Australian business on international calls in 1997-98 was around $315, with the average residential user spending around $76, or about a quarter of the amount spent by business (OECD 1999, pp. 174, 178–179).

2.5 Recent trends in Australian consumer prices

Changes in consumer prices give an indication of the benefits from reform (provider prices are covered in chapter 3).

Participants were generally of the view that consumer prices for international telecommunications services have substantially declined in recent years. For example, Cable & Wireless Optus noted that its standard reference prices (a subset of peak, off-peak and weekend rates based on a three minute call duration and its ten most popular international call destinations) had fallen 26 per cent in real terms since 1992 (sub. 5, p. 4). In addition, DOCITA noted that, between June 1997 and June 1998, price reductions of up to 65 per cent had occurred for some international calls (sub. 6, p. 34). Further, Telstra stated that its average traffic weighted price per IDD minute decreased by 72 per cent over the year to May 1999. Over this period, the most dramatic price falls were for high volume destinations such as the United States, United Kingdom and New Zealand (sub. D17, pp1, 4–5).

Although this view was confirmed in studies produced by the ACCC, the Productivity Commission and the OECD, there was general agreement in the

studies that retail prices in Australia were still above those provided in some other developed nations (see box 2.4).

Box 2.4 **Retail prices for international telecommunications services**

The ACCC reported that Telstra's overall weighted international call price had decreased by 27 per cent from 1992 to 1998. The ACCC also compared the price of a Telstra call from Australia to a particular country with the price of the same call made from that country to Australia. While in 1992 Telstra compared well — with most calls made from other countries being more expensive than the equivalent Telstra call — in 1998 this situation was reversed. In 1998, the prices of Telstra's international calls from Australia were consistently more expensive than identical calls initiated in other countries. This was caused by price decreases in the countries compared, rather than Telstra price increases.

The Productivity Commission compared the performance of Australia's telecommunications services industry with those in other, generally high performing, countries. This study found that European countries had lower prices for a basket of both residential and business PSTN international calls than the non-European countries (including Australia) used in the comparison. This is likely to reflect, in part, the international call profile of the relevant countries — European countries had larger traffic volumes and generally called closer neighbours, while the Australian traffic profile had a smaller volume of international calls that traversed greater distances. Telstra has attributed the low consumer prices faced in Sweden and Finland to their light handed regulatory regimes (sub. D17, p. 8).

The OECD compared member countries' average peak prices for calls with other OECD countries. It found that average Australian peak international prices had decreased since 1991, but that other OECD countries had (on average) achieved greater reductions in peak prices.

For dial-up retail users of the Internet, the most important price is the combined PSTN and Internet access price at peak and off peak rates. For consumers staying on line for 20 hours per month and calling an Internet service provider for the price of a local call from the largest city, the OECD ranked Australia as having the third cheapest peak rate and tenth cheapest off-peak rate.

Source: ACCC (1998d); OECD (1999); PC (1999).

A recent Government decision to retain price caps on a range of services provided by Telstra is intended to reduce average consumer prices (Alston 1999). As a result of this decision, Telstra is required to reduce average prices for a broad basket of services, including local and international calls and leased lines, by at least 5.5 per cent each year in real terms.

Access and pricing of digital data and transmission services were investigated by the ACCC in 1998 (ACCC 1998b). The ACCC subsequently 'declared' (that is, it specified that it could now arbitrate to resolve disputes about the terms and conditions of supply) certain data services and modified previous declarations in order to address price rigidities and increase the effectiveness of the declarations in meeting the needs of access seekers (ACCC 1998c).

Despite this action, ATUG (sub.3, p. 3) suggested that the benefits of recent telecommunications reform have not flowed through to users of dedicated links or data services (this is discussed further in section 6.6).

3 Payment arrangements and pressures for change

Until recently, the traditional accounting rate system under the auspices of the International Telecommunications Union (ITU) has been the predominant form of payment between providers in one country and providers in other countries for international telecommunications services. However, in recent years this system has been under pressure and a number of other payment arrangements have been growing in importance.

This chapter commences with a brief review of the role of the ITU and other significant international institutions involved with international telecommunications. It then describes various payment arrangements for international telecommunications setting out: details of the accounting rate system and pressures on this system; payments made for the individual components of service such as cable usage and interconnection; and peering, transmission and interconnection payments for the Internet.

3.1 International institutions

Arrangements for the pricing of international telecommunications can be traced back to 1865, when 20 European nations came together to form what is now known as the ITU. In recent years, however, the WTO has also begun to have an important role in telecommunications. As well, the actions of the US Federal Communications Commission (FCC) have significant international implications. Each of these institutions is discussed briefly below, with greater detail provided in appendix A.

The ITU, of which Australia is a Member State, is an international organisation within which governments (Member States) and the private sector (Sector Members) coordinate global telecom networks and services. It has established International Telecommunications Regulations (ITRs) which Member States are bound to uphold. Their purpose is to:

- establish the general principles which relate to the provision and operation of international telecommunications services offered to the public, as well as to the

underlying international telecommunication transport means used to provide such services;

- set rules applicable to governments and providers; and
- facilitate global interconnection and interoperability of telecommunications facilities and promote the harmonious development and efficient operation of technical facilities, as well as the efficiency, usefulness and availability to the public of international telecommunications services (sub. 6, p. 11).

As well, a number of recommendations have been developed which aim to set out methods which countries can use to implement the ITRs. Compliance with the recommendations is not compulsory. In recognition of pressures for change, work is being undertaken by the ITU to develop and refine recommendations relating to the accounting rate system. ITU recommendations adopted in June 1999 could assist future reform by allowing a choice of payment systems (see appendix A and section 6.2).

The WTO Agreement on Basic Telecommunications (ABT), which came into force in February 1998, brought basic telecommunications into the scope of the General Agreement on Trade in Services (GATS) for the first time. According to DFAT (sub. 11, p. 5 and personal communication), 69 countries (the European Union counting as one), accounting for around 93 per cent of world telecommunications trade, entered commitments. This number had grown to 75 countries at November 1998 (WTO 1998a). The agreement binds governments and their regulators to varying commitments about market access (including foreign direct investment controls) and national treatment. In addition, a total of 57 countries, including Australia, agreed to be bound by a Reference Paper, which sets out pro-competitive regulatory principles for basic telecommunications services.

According to DFAT's submission, members of the WTO sought to agree on a set of principles within the GATS for dealing with international accounting rates and settlements for telecommunications (sub.11, p. 6). As they were unable to agree at that time, the accounting rate system was not covered by the ABT. However, WTO members have agreed to return to the accounting rate issue at the next round of GATS negotiations due to begin by 1January 2000.

Because of the volume of international telecommunications to, from, or through the United States, the actions of the FCC have important significance for the accounting rate system. Of particular note is the FCC's attempt to unilaterally impose 'benchmark' or price caps on US settlement rates. Under a 1997 order, settlement rates negotiated by US providers may not exceed 15 (US) cents per minute for foreign providers in upper-income nations; 19 cents per minute for foreign providers

in middle-income nations; and 23 cents per minute for foreign providers in lower-income nations. These benchmark rates are being phased in from 1 January 1999 over the period to 2003.

3.2 The international accounting rate system

The accounting rate system was developed by the ITU, initially for international telegraphy, and later for other forms of international telecommunications traffic.

Conceptually, the accounting rate is meant to represent the total end-to-end cost of making an international call. This comprises the cost of:

- carrying the call through the domestic network of the country where the call originates to an international gateway (ie origination);
- international carriage typically by either cable or satellite to an international exchange in the other country (international transmission); and
- carrying the call from that international exchange to the called party (termination).

Accounting rates are generally denominated in US dollars, gold francs, or Special Drawing Rights (a monetary system based on a 'basket' of major currencies) per *paid minute* of traffic. These accounting rates are normally negotiated bilaterally between an international traffic provider in one country and a provider in the other and/or between telecommunications administrations. Once the accounting rate has been agreed, settlement rates are then determined, usually at half the accounting rate.

Rather than making continuous payments to one another, providers settle their net balances at the end of the settlement period. On any bilateral route, the actual amount paid or received by a provider for call termination services is related to the provider's *balance* of incoming and outgoing traffic at the end of the settlement period, and the (relevant) settlement rate (box3.1). Thus, where traffic between countries is balanced, no payment is made. Where there is a high settlement rate, the payment made for a traffic imbalance is greater than where the settlement rate is low.

Special arrangements apply when traffic transits through one or more intermediate countries between its origin and destination.

Although comprehensive information on accounting rates for traffic to and from Australia is not available, the FCC publishes accounting rates between the United States and other countries, including Australia (see table3.1). This information,

published in July 1999, apparently indicates that some providers have been able to negotiate lower accounting rates than Telstra on the United States/Australia route. Telstra has subsequently advised the Commission that it has moved to different confidential commercial arrangements with US carriers (sub. D17, p. 5).

Box 3.1 **Settlement for international telephony under the accounting rate system**

When a call is made from country A to country B, the provider in country A collects and retains the full customer charge and is liable to pay the provider in country B to carry the call from the (notional) midpoint of the international circuit to its final destination. In the same way, when the provider in country A terminates a call from country B, it is liable to receive a payment from country B. In practice, payment is made according to the balance of traffic.

Suppose that at the end of a settlement period:

- a provider in country A has terminated 100 minutes of traffic sent to it by a provider in country B; and
- the provider in country B has terminated 80 minutes of traffic sent from the provider in country A.

Then country A has a surplus of incoming over outgoing traffic of 20 minutes with the country B provider. Similarly, the provider in country B has a deficit of the same magnitude with the provider in country A. Therefore a net payment is made by the deficit provider in country B to the surplus provider in country A. The value of the payment would be 20 minutes multiplied by the (relevant) settlement rate per minute.

Even though accounting rates have fallen in the last few years in non-liberalised markets, they generally remain higher for traffic with non-liberalised markets. In the absence of available Australian data, US rates provide a useful proxy, at least until 1999 when the FCC's benchmark rates begin to take effect. The accounting rates between the United States and the non-liberalised market of China, for instance, remain significantly higher than with liberalised markets, such as Australia (table 3.1).

Despite pressures on the accounting rate system (outlined below), it remains important. For example, US data show that accounting rate traffic in 1997 accounted for 91 per cent of telephone traffic billed by Australian providers which originated in Australia and terminated in the United States, and 79 per cent of US billed telephone traffic which terminated in Australia (table 3.2).

Nevertheless, the situation may be changing rapidly. Telstra advised the Commission that more commercially oriented arrangements now cover approximately 80 per cent of its current PSTN business (sub 12, p. 1).

Table 3.1 **Selected accounting rates with the United States: Australia, Singapore and China, 1993 to 1999 ($US)**

	1993	*1994*	*1995*	*1996*	*1997*	*1998*	*1999*[a]
Australia							
Telstra	.76	.59	.59	.45	.42	.30	.29[b]
Optus	.76	.59	.59	.43	.15 or less	.15 or less	.15 or less
AAPT							.30
Axi-Corp Primus					.20	.20	.20
TNS-Telegroup[c]					.10	.10	.10
Singapore	.86	.92	.92	.90	.85	.52	na
China	2.93	2.91	2.67	2.13	1.69	1.40	1.13

a The FCC adopted benchmark settlement rates for countries to be phased in over the period to 1 January 2003. From 1 January 1999, the settlement rate for Australia and Singapore was 15 US cents per minute, while the settlement rate for China is to be 23 US cents per minute by 1 January 2002. **b** Although this rate has been published by the FCC, Telstra advised that it has moved to different confidential commercial arrangements with US carriers. **c** In February 1999, Telegroup filed for relief under the US Bankruptcy Act.

Source: FCC (1999a, 1999b).

Table 3.2 **Australia-US international telephone traffic, 1997 (per cent)**

Traffic payment	*Billed by Australian provider (excludes transit traffic)*	*Billed by US provider*
Traditional settlement	91	79
Non traditional settlement[a]	9	21
All traffic	100	100

a Includes International Simple Resale (ISR), hubbed, switched and other traffic that is settled outside the FCC's International Settlement Policy based on the accounting rate system.

Source: FCC (1998, Tables A1, A62-64).

3.3 Pressures on the accounting rate system

Until recently, international operators in most countries were monopolies and were generally also the sole providers of local and domestic long distance facilities and services. Within this environment, the accounting rate system provided the advantages of simplicity, ease of administration and predictability. It provided a stable basis for international telephony pricing and settlements between providers as long as several fundamental criteria continued to be satisfied: international services being jointly provided by monopoly partners; collection rates (ie end user charges) approximately equal for the same call in both directions; settlement rates lower than collection rates; and incoming and outgoing traffic being approximately in balance (Madden and Savage 1997, p. 21).

These conditions have become increasingly less relevant because of: the increasing liberalisation of telecommunications markets; new technologies which have reduced the cost of providing international services; increased transmission of data compared with voice; imbalances in traffic flows; and the lack of specific provision for rapidly growing areas such as mobile and the Internet. Because accounting rates have not adjusted rapidly enough, these factors have placed the traditional accounting arrangements under pressure.

The nature of telecommunications services provision

The traditional concept of international communications as a jointly provided service is breaking down. DOCITA 'promotes the understanding of international telecommunications as a traded service, in which an operator in country B provides a termination service to complete a call or deliver a message that is initiated through an operator in country A' (sub. 6, p. 28). As the World Telecommunication Development Report indicated:

> We are moving from a world of one-to-one relations to a world of many-to-many. (ITU 1997, p. 6)

The examples given in box 3.2 of a number of ways in which communications emanating from a provider in one country may be carried to their destination in another country illustrate the breaking down of the monopoly supplier jointly provided service model.

These transmission possibilities illustrate an active market in international carriage of telecommunications, independent of any one country's national rules or market regulations. They do not rely on the traditional notions of joint provision, of half-circuits or a 'midpoint' of the international circuit.

Global alliances and other ways of 'doing business' are further eroding the bilateral relationship between providers. For example, as DOCITA points out:

> Global wholesale carriers such as PanAmSat or (in future) Project Oxygen also make it unnecessary for individual carriers to negotiate directly with every carrier who might terminate a service for them. To remain valid, the international regulations must recognise the participation of new entities such as those that aggregate traffic from a number of sources and deliver it with greater efficiency than a myriad of bilateral relationships could achieve. (Sub. 6, p. 32)

Box 3.2 **International telecommunications as traded services**

To illustrate the traded services nature of international telecommunications, this box lists a number of different supply arrangements. Other possibilities also exist.

- Cable owned jointly by the provider originating and the provider terminating the signal.
- Cable capacity owned wholly by one provider and terminating in the territory of another country.
- Cable capacity leased from a consortium in which one or both of the providers have invested.
- Satellite capacity owned by a provider (eg Cable & Wireless Optus), leased (eg Telstra from PanAmSat), or allocated from an international satellite co-investment organisation (INTELSAT or Inmarsat).
- Capacity on alternate routing obtained on the bandwidth spot market.
- Services wholly managed by a third party or consortium (eg Global One, WorldCom MCI, AT&T).
- Services 'terminated' in a third country and refiled to destination to take advantage of differences in capacity and service pricing.

Source: DOCITA (sub. 6, pp. 14-15).

Further, the ACA goes on to comment that:

> the emergence of global alliances between major telecommunications providers may see the emergence of commercial 'ownership' of all aspects of the international network, including international telecommunications lines, which might well alter the traditional approach to settlement rate strategies, based on commercial realities. (Sub. 7, p. 9)

Following liberalisation of the Australian market in July 1997, there are about 12 international providers and global alliances operating from Australia (sub. 4, p. 2).

Traffic imbalance

The continuation of accounting rates at levels significantly above underlying costs, together with large traffic imbalances have added to the pressure for accounting rate reform. For the United States, the settlement deficit has grown from $1.2 billion in 1985 to $5.4 billion in 1996, amounting to around 3 per cent of the total US trade deficit. Australia also had a settlement deficit — accounting rate traffic for Australia was estimated to be around 25 per cent greater than inbound traffic in 1995-96. Providers in developing countries, which have a higher volume of inbound than

outbound traffic, are estimated to receive about $10 billion a year in settlement payments (Ovum 1998, p. 159).

New forms of traffic

ITU recommendations 'apply to the exchange of traffic across the Public Switched Telephony Network (PSTN). There are no regulated arrangements governing settlements for some rapidly growing market segments such as mobile phones and Internet services' (sub. 6, p. 25).

No differentiation of accounting rates is made between international calls to or from fixed network subscribers and to or from mobile network subscribers. In particular, no allowance is made for the higher charges often levied for interconnection with mobile networks compared to interconnection with fixed networks. As a result, on international calls to or from mobile phones, either the international facilities operator or the mobile operator has to incur a loss when originating or terminating a call. This is becoming a significant issue with the rapid growth in use of mobile phones, including for international calls.

Some responses

The growing liberalisation of domestic telecommunications markets has enabled monopoly providers in non-liberalised countries to seek to take advantage of international providers in liberalised markets. As well, providers in liberalised and non-liberalised countries have sought to exploit the weaknesses of the accounting rate system.

Exploitation of market power

To guard against exploitation of market power, some countries (although not Australia) currently adopt the following measures:

- *Proportionate return* where the amount of bilateral traffic returned to a provider by its foreign correspondent is determined by the proportion of the country's total outgoing traffic originated by that provider's customers. For example, a provider with 30 per cent market share of outbound international minutes on a particular route would expect to receive 30 per cent of the inbound traffic on the same route.
- *Parallel accounting* requires that each provider serving a route receives the same settlement rate for terminating calls. It prevents a monopoly originating provider

from negotiating lower rates from competing terminating providers. Parallel accounting also limits the ability of a competitor in a country to gain an advantage over its rivals.

Chapter 4 explains various ways in which providers can seek to exploit remaining monopoly powers.

Alternative calling procedures

International telecommunications providers can use a number of alternatives to the traditional arrangements for routing traffic. These alternatives 'bypass' the traditional cost-sharing arrangements of the accounting rate system. They may be practised by traditional facilities-based providers or by service providers who operate exclusively or partly by reselling the services of others. DOCITA identifies refile, callback, international simple resale (ISR) and end-to-end interconnection as examples of alternative calling procedures (sub. 6, p. 26). As the ACA similarly points out:

> Inequities in the current system of settlement rates [have] led to development of alternative calling procedures including calling cards, country direct services, international resale and callback. (Sub. 7, p. 8)

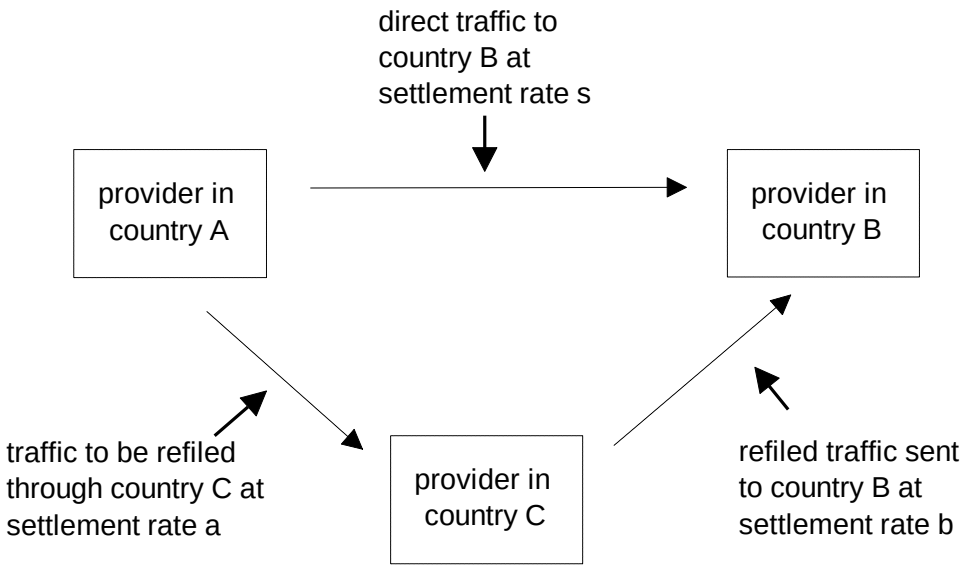
ISR and interconnection both involve the provision of the international component of the telecommunications service by one provider, rather than by different providers in the originating and terminating countries. More details are given in chapter 4. Refile and callback are described below.

Refile

Refile is a form of transit routing where an intermediate country is incorrectly recorded as the point of origination in order to take advantage of a lower settlement rate for traffic from the intermediate country to the destination country. For instance, assume a provider in country A can route traffic directly to country B at a particular settlement rate, whereas a provider in country C can route traffic directly to country B at a lower settlement rate. If the difference between the two settlement rates is significant then, rather than pay the higher settlement rate governing the direct route, the provider in country A may route its traffic to a provider in country C, which then forwards the traffic to country B at its settlement rate. For this service, the provider in country A pays the provider in country C a negotiated fee (figure 3.1). The provider in country C may, for reasons such as exploiting proportionate return policies with country B, be theoretically able to refile country A's traffic to country C free of charge to A.

The recommendations of the ITU do not allow refile.

Figure 3.1 **Refile**



Callback

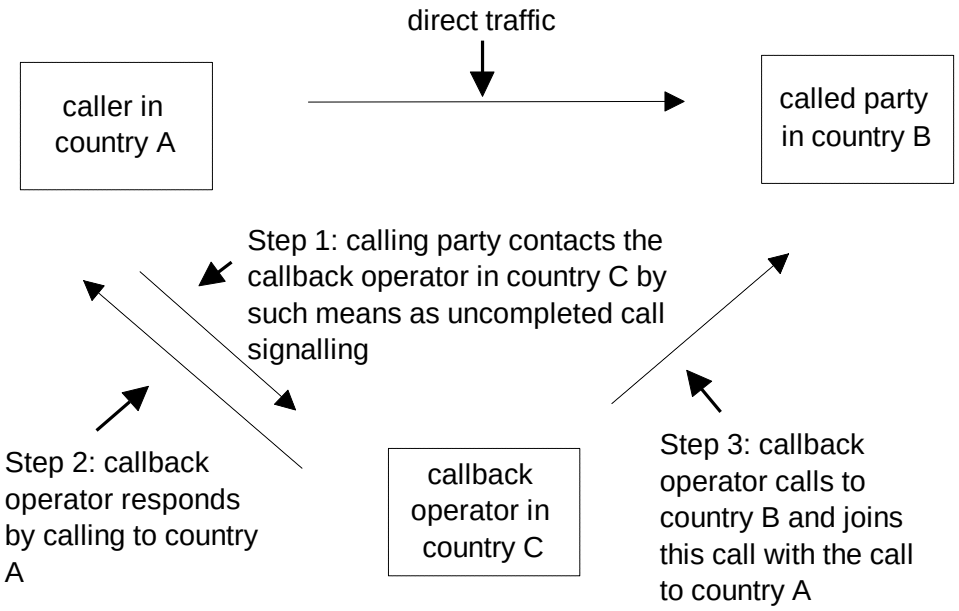
Callback is spurred by a combination of differential retail and wholesale prices. It involves the joining of two calls by a callback operator: one from the operator to the calling party, the other from the operator to the called party. In many cases, the costs of the two calls from the callback operator is cheaper than if the calling party contacted the called party directly using a domestic provider's services. Callback operators tend to be located in countries (such as the United States) which have negotiated low settlement rates for call termination, while their customers are in countries with high retail prices for international calls (figure 3.2).

Although the ITU has been under some pressure from some countries to ban callback, its Council has determined that it is the sovereign right of each country to regulate telecommunications services. As of October 1998, callback is prohibited in 86 countries including China, India, Indonesia, Malaysia and the Philippines (ITU 1998).

3.4 Payment for facilities

Payment for traffic outside the accounting rate system tends to be based on the facilities used or capacity purchased. This focuses attention on the underlying elements making up the costs of international telecommunications, namely, cable or satellite circuits and interconnection costs.

Figure 3.2 **Callback**



Cables

Access to cable can be obtained in several ways. One involves the lease of half circuits (for example, to access the United States, it would be necessary to lease a half circuit from an Australian provider, as well as a half circuit from a US provider). Payment is generally on a capacity basis. Telstra and Cable & Wireless Optus have been the main providers of international leased line half circuits from Australia.

Alternatively, cable capacity can be purchased as a minimum investment unit (MIU), or leased by means of an Indefeasible Right of Use (IRU) in a cable consortium (box 3.3).

Different arrangements for access are likely to apply to newer cables, soon to come on line, some of which are being constructed by investors not traditionally associated with the international telecommunications industry. Some of the cables

will be available to carriers only, on others full circuit capacity could be open to all comers.

Box 3.3 **Access to cables**

Minimum investment unit (MIU): this is equity in capacity on international cables in cable consortia. It differs from an IRU in that it gives ownership of the cable, voting rights, and rights to extra capacity if the design capacity of a cable is subsequently expanded. This is often restricted to major carriers.

Indefeasible Right of Use (IRU): this is a measure used to denote the right to use cables during the time and bandwidth specified in the IRU. It is essentially a lease on part of a cable. IRU owners usually have the right to use capacity for the life of the cable and are liable to pay maintenance charges.

Source: Ovum 1998.

Prices paid by providers

Chapter 4 sets out some evidence that access to cable capacity can be expensive relative to the underlying costs. Further, access has been difficult because of restricted capacity.

There is also evidence that prices for the Australian end half circuit have been higher than for the far end half circuit. According to Nelson (1998, p475), average standard prices in 1998 for the use of a 2Mbps half circuit from Australia to the United States were:

- Telstra half circuit fibre — $84 000 per month;
- US carrier half circuit fibre — $40 000 to $60 000 per month;
- satellite — $75 000 per month;
- discount rates are offered on fixed term contracts (for example one, three, and five year periods).

Telstra has indicated that 'list prices are not the actual prices that customers pay. In today's competitive market all carriers including Telstra have strong off-tariff discounts which have been used since February 1997' (sub. D19, p. 1).

Interconnection

Interconnection charges are paid by providers for connection of international circuits and traffic to the PSTN, mobile networks or to the Internet (see section 3.5 for payments for ISP interconnection).

Prices paid by providers

There is little direct evidence of the prices paid by providers of international telecommunications for access to Telstra's domestic network. However, in recent work, the ACCC has examined Telstra's undertakings for PSTN access for different call durations and two traffic profiles. These profiles are for:

- a ubiquitous access seeker interconnecting with Telstra in each of its 66 call collection areas; and
- a limited access seeker with a limited number of points of interconnection in mainly CBD and metropolitan areas.

ACCC's assessment of these undertakings for a number of traffic profiles is set out in table 3.3. The average charge per minute for a ubiquitous access seeker for a 4 minute call was 4.73 cents per minute. This is about 15 per cent higher than the average charge for a limited access seeker because there is a higher proportion of traffic in CBD and metropolitan areas and during off-peak times.

Table 3.3 **Average access charges in Telstra's 1997 PSTN undertaking[a] (cents per minute)**

Duration of call	*Ubiquitous access seeker*	*Limited access seeker*
2 minute	4.99	4.07
4 minute	4.73	4.01
6 minute	4.64	3.99
10 minute	4.57	3.97

a Unsuccessful calls comprise 27 per cent of total calls. The above charges exclude Telstra's general operations and maintenance charge in the Undertaking of 0.026 cents per conversation minute. An intra-call collection area trunk charge is incurred in about 10 per cent of successful calls.

Source: ACCC (1999a p. 45).

In June 1999, the ACCC rejected the terms and conditions of Telstra's undertakings for PSTN originating and terminating access. It estimated that the efficient cost of access was between 1.73 to 2.53 cents per minute in 1998-99.

3.5 Payment for Internet traffic

In order to fully understand payment arrangements for international traffic relating to the Internet it is necessary to have some understanding of Internet payment arrangements within both the United States and Australia, including the role of 'peering'.

Peering has traditionally been extensively used for Internet interconnection, originating when Internet access was managed principally by a limited number of subsidised regional entities. Under peering, providers can agree to accept all Internet traffic addressed to their network without any charge. Such agreements can be based on a 'sender keeps all' (SKA) settlement. In broad terms, this is sustainable where there is an equality of traffic being exchanged and/or where the parties involved perceive equal benefit from the interconnection.

Payment for Internet traffic within the United States

Many of the largest US private backbone providers have bilateral 'peering' arrangements to exchange traffic with each other. However, in April 1997, UUNet one of the major ISPs in the United States, announced that it would only continue peering with ISPs that met minimum requirements regarding quality of service and backbone capacity. It would no longer accept peering requests from other ISPs whose infrastructure would not allow for the exchange of similar traffic levels. The company stated that these ISPs were seeking to use its network free of charge and were not providing it with a return on its growing investment in infrastructure. Most major ISPs in the United States are now adopting a similar approach.

Since only large ISPs can effectively meet these criteria, the peering agreements with smaller ISPs have been rescinded, and they are now being charged for the interconnection service.

Payment for Internet traffic within Australia

Telstra is Australia's largest provider of international Internet transmission links. Telstra and a few competing providers of backbone networks offer transmission and interconnection services to ISPs and amongst one another. Telstra also operates as an ISP in its own right.

Until recently, Telstra made no payment for any traffic that was carried by other ISP competitors on its behalf. As a result, the ACCC issued a competition notice in May 1998 stating that Telstra had engaged in anti-competitive conduct by charging its

Internet competitors for services by Telstra while, at the same time, refusing to pay for the similar services it received from those same Internet customers. The ACCC expressed concern that Telstra's conduct could lead to it monopolising the Internet industry in Australia. Telstra subsequently signed an agreement crediting OzEmail for the carriage of Telstra's Internet traffic. Agreements were subsequently made with other competitors, Connect.com and Cable & Wireless Optus.

Payment for Internet traffic between Australia and the United States

Australian ISPs pay the full cost of the international capacity needed for transmission of Internet traffic to and from the United States. They also pay port charges (ie interconnection charges) to link into the Internet in the United States, although US providers do not pay to link into the Internet in Australia.

Telstra indicated that there is a range of options available to non-US Internet providers to buy connectivity to the United States:

- The US international half circuit lease and the Internet port charge are bundled together into a single monthly tariff, usually on a flat rate/utilisation independent basis. Such bundling can be easily done by US telecommunications providers who own both international half circuit capacity to Australia and Internet backbones.
- The half circuit lease and the port charge are tariffed and billed separately by the same provider.
- The half circuit lease, domestic tail lease and the port charge are procured and paid to separate operators.
- The non-US operators acquire fully owned capacity to the United States, lease domestic tail circuits, establish their own Internet Point of Presence (PoP) in the United States and pay for port charges as required to one or more Internet operators. As noted in box 2.3, Telstra intends to extend its Internet backbone into the United States and establish, jointly with a number of Asian carriers, an Internet router at the Palo Alto Internet exchange.
- The non-US client connects to a local PoP of the US operator (eg UUNet in Sydney) and pays a port charge. (Sub. 8, p. 4)

However, all these options involve the payment by Australian providers of the entire cost of international Internet transmission and interconnection.

3.6 Summing up

The traditional payment arrangement for international telecommunications — the accounting rate system — is rapidly breaking down. A number of other arrangements are gaining prominence, including payment based on the components of service supplied. Essentially, international telecommunications is being transformed from a service jointly supplied by providers in more than one country, to being a broadly traded service.

These developments have been driven by factors such as domestic market liberalisation, technological change, development of new services and growth in demand, rather than by ITU sponsored change of the international payment arrangements.

4 Inefficient pricing of payment arrangements

This chapter examines 'distortions or mispricing' of payment arrangements. This phrase, which is used in the terms of reference, is interpreted by the Commission to mean the effects of inefficient pricing; that is, the effects of a divergence between the price charged to providers and an appropriate cost benchmark. The chapter begins by defining such a benchmark. It then discusses in broad terms the nature of the effects of inefficient pricing on providers, final consumers and the community as a whole. It concludes by presenting available evidence.

Evidence of inefficient pricing may be observed directly from comparisons between prices and costs of international telecommunications services and indirectly, for example, from providers' competitive and investment responses to divergences.

However, caution is required in attributing particular provider responses to inefficient pricing of payment arrangements as other factors may be at play. For example, although inefficient prices may induce providers to form alliances with other providers or to engage in international simple resale, such responses may have occurred because of new opportunities arising from market liberalisation, technological change and growth in demand.

Determining the overall impact of inefficient pricing of payment arrangements on the Australian economy would involve aggregating the various economic effects, not only for international telecommunications services, but for all activities in which these services are inputs. There are insufficient data available to undertake such an analysis.

4.1 Defining the cost benchmark

A widely accepted theoretical benchmark for assessing the efficiency of a price charged in a payment arrangement is the long run marginal cost of providing the relevant international telecommunications service (see box 4.1). (For a review of benchmarks other than long run marginal cost see IC 1997b and BTCE 1997.)

In principle, long run marginal cost is the addition to the total cost of a facility involved in providing the last unit of service, allowing for future changes in capacity and technology. It includes operating costs, depreciation and provision for a normal return on capital, but not unallocable (or common) costs. As the provision of a service usually entails a number of facilities, the cost benchmark consists of the sum of a number of long run marginal costs.

Box 4.1 **Long run marginal cost pricing and public utility services**

To assess the pricing of telecommunications services, it is useful to draw on the general literature governing the pricing of public utility services. These services typically are provided by government monopolies, involve facilities (or infrastructure) such as roads, dams and sewerage treatment works and exhibit a particular cost profile (see below).

The literature notes that there is a conflict between pricing for the efficient provision (and use) of the services and pricing to recover total costs (that is, ensuring viability).

- Efficiency would require that prices be set where the consumer valuation (or willingness to pay) at the margin is equal to marginal cost; that is, the addition to the total cost of providing the last unit of service. Marginal cost typically declines with increases in units of the service. Long run marginal cost (LRMC) is marginal cost which reflects changes in technology and capacity. Short run marginal cost (SRMC) reflects a given technology and capacity.
- However, if price were to be set at marginal cost (whether LRMC or SRMC) and this were below average cost, then the provider would experience a loss and its viability would be affected.

An approach to resolving this conflict involves setting prices equal to LRMC plus a mark up to enable the recovery of unallocable costs and, thus, ensure viability. Ways of minimising the inefficiency associated with pricing above marginal cost are to:

- undertake Ramsey-Boiteux pricing (price services according to the elasticity of consumer demand); or
- impose an additional access price (where prices do not vary with use).

For example, to assess the settlement rate charged by a provider in country B to a provider in country A, the relevant cost benchmark is the long run marginal cost of carrying and terminating telephone calls in country B. Assuming that providers in countries A and B have equal responsibility for international transmission capacity, the benchmark consists of the sum of the long run marginal costs of:

- transmitting the call from the midpoint of the international circuit to the international gateway in country B;

- using the international gateway in country B; and
- transmitting the call from the international gateway to the called party in country B.

However, there are situations in which it would be theoretically or practically inappropriate to apply the concept of long run marginal cost to the pricing of international telecommunications services.

- As noted in box 4.1, basing price on long run marginal cost may not enable recovery of the total cost of providing a service and, thus, enable provider viability. To achieve full cost recovery, price may need to be set above long run marginal cost. The ACCC uses this approach when assessing telecommunications prices (see box 4.2).
- Also, pricing at long run marginal cost would not lead to efficient use of a facility in the short run where capacity is fully utilised or there is congestion; that is, where there is high demand for existing capacity. In this situation, it would be more efficient to price at (the higher) short run marginal cost. Such pricing would act as a signal to providers to invest in the augmentation of existing capacity.
- Finally, measuring long run marginal cost can be a complicated exercise. Indeed, telecommunications regulators often use long run average cost, which is easier to derive and in some circumstances (such as constant returns to scale in provision) approximate long run marginal cost.

The remainder of this chapter proceeds on the basis of assessing prices in payment arrangements against various cost benchmarks. Although these benchmarks do not always reflect long run marginal cost, they serve to illustrate inefficient pricing of payment arrangements.

4.2 Broad economic effects of inefficient pricing

The prices charged under a payment arrangement that are above the appropriate cost benchmark may have various economic effects on providers, final consumers and the community as a whole. The effects on providers and final consumers depend on whether a provider makes or receives payments. The effects on community welfare depend on whether payments are made to a domestic provider or to a foreign provider.

Box 4.2 The ACCC's approach to assessing telecommunications prices

The ACCC's assessment of telecommunications prices involves the application of a total service long run incremental cost (TSLRIC) benchmark. This is defined as the 'forward looking incremental cost' of providing the whole service when the other activities of the provider remain unchanged. TSLRIC includes operating and maintenance costs, a normal commercial return on capital and common costs 'causally related' to the service (ACCC 1997, pp. 28, 38).

In its recent assessment of Telstra's price undertaking for originating and terminating access services to its public switched telephone network, the ACCC considered whether to include a contribution to the 'access deficit' in relation to Telstra's customer access network (CAN) in its cost benchmark. The access deficit is the difference between 'non-call related costs', such as line related costs, and 'non-call related revenues', such as line rental and connection revenues.

The ACCC noted that retail price caps on residential line rental and connection charges applying until 30 June 1999 (consisting of, among other things, a CPI minus 1 per cent price cap on residential line rentals and collection charges) constrained Telstra from increasing the charges with the result there was an access deficit on residential lines (but not on business lines or ISDN lines) (ACCC 1999a, p. 50). It said that:

> in the long-term, not allowing Telstra to recover a part of any residential access deficit from originating and terminating access charges may:
>
> - encourage inefficient entry, by constraining Telstra from competing on its relative merits in the long-distance and mobile markets;
> - discourage efficient investment by entrants (by making using Telstra's CAN more commercially attractive than building alternative facilities);
> - prevent Telstra from recovering legitimate costs;
> - result in Telstra under-investing in upgrading the CAN; and
> - create inefficient arbitrage opportunities (as different calls using the CAN will incur different charges). (ACCC 1999a, p. 51)

The ACCC accordingly decided that it would include a contribution to Telstra's residential access deficit in its cost benchmark (ACCC 1999a, p. 52).

The ACCC did not form a view on whether Telstra would be able to increase line rental and connection charges to fully recover line-related costs under new retail price caps to apply from 1 July 1999 to 30 June 2001. These include, among other things, a retail price cap of CPI on a basket of line rentals and local calls for residential and business customers and a retail price cap of CPI minus 5.5 per cent on a basket of digital cellular mobile telephone services, connections, domestic leased lines, international leased lines, local calls, trunk calls and international calls. However, the ACCC stated it would give further consideration to how the access deficit should be treated under them.

Effects on providers

An excessive price under a payment arrangement affects a provider in different ways depending on whether it pays or receives the price. If the provider pays, its expenditure is higher than it would otherwise be. The provider may mitigate this effect in the short term by passing on a proportion of the extra expenditure it must pay through an increase in retail prices to final consumers. In the longer term, if market conditions and regulation permit, the provider may reduce or avoid payments through the implementation of various competitive and investment strategies such as:

- investing in new international infrastructure capacity, new technology, foreign points of presence or alliances with other providers;
- pursuing alternative payment arrangements; and/or
- routing its traffic in alternative ways.

On the other hand, if a provider receives an excessive price, its revenue is higher than otherwise. In the short term, it may retain the extra revenue to increase profits which, in turn, may be used for investment or be distributed to shareholders. In the longer term, if the market is liberalised, the existence of any excess profits in the industry (that is, profits in excess of what is normal) may attract the entry of new providers.

Although the responses of providers to pricing inefficiency in payment arrangements are rationally-based — that is, the responses are prompted by a desire to reduce or avoid unnecessary costs on them or to exploit market power — they do not lead to an allocation of resources which maximises community-wide welfare. Indeed, as is noted later, inefficient prices in payment arrangements may impose welfare losses on the whole community.

Effects on final consumers

Final consumers may also be affected by excessive prices under payment arrangements, albeit less directly than providers. For example, as noted above, a provider who pays an excessive price may, in the short term, pass a proportion of the extra cost on to final consumers by increasing retail prices. In response, consumers may reduce demand for the service and/or increase demand for substitute services. The extent to which higher retail prices are sustained other than in the short term, however, depends on the competitiveness of the industry (that is, the likely price response of the provider's competitors) as well as the availability of substitutes.

Effects on community welfare

Excessive prices in payment arrangements may impose welfare losses on the community. Box 4.3 illustrates this using a framework which focuses on first order effects at the provider level in the international telecommunications market in Australia. Although effects at the final consumer level are not explicitly captured, they are likely to be at least of the same magnitude provided there are no other factors (other than payment arrangements) influencing prices.

The extent of the total welfare loss varies according to whether payments are made by domestic providers to another domestic provider or to a foreign provider. In both cases, the welfare loss includes the excess of the foregone value to providers (which reflects foregone value to final consumers) over the long run marginal cost of the service. If payments are made to foreign providers, the welfare loss also includes the additional expenditure made by providers to obtain the service. This additional expenditure is a direct transfer to foreigners and is, thus, not available to the community to use in other activities. However, if payments are made to other domestic providers, the additional expenditure is not lost to the community, but is transferred domestically.

The welfare losses captured in box 4.3 constitute an important basis for estimating the benefits available from reforms to payment arrangements. These benefits are examined further in chapter 5.

4.3 Evidence of inefficient pricing: the accounting rate system

Direct evidence

Despite declines in recent years in both settlement rates and the costs of terminating international telephone calls, ITU Recommendations and Regulations continue to enable providers to set settlement rates which diverge significantly from underlying costs.

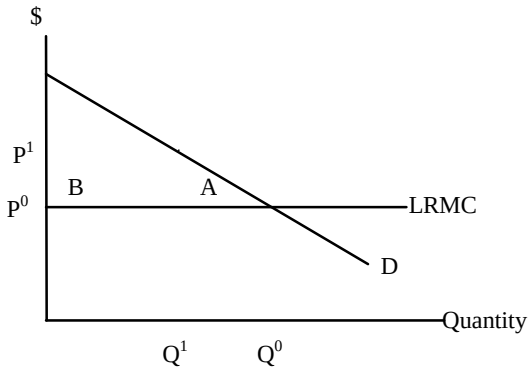
Settlement rates which exceed costs are a particular problem on routes to and from countries which have not liberalised their markets. For example, in a series of developing country case studies commissioned by the ITU in 1998, 'effective' settlement rates exceeded 'effective' costs per minute (in US cents) by 36 per cent for Colombia, 144 per cent for Lesotho, 182 per cent for India and 429 per cent for Sri Lanka (Wetteman and Kelly 1998, p. 26).

Box 4.3 **Welfare losses of payment arrangements**

Welfare losses may arise for Australia if the price charged under a payment arrangement exceeds the long run marginal cost (LRMC) of providing the international telecommunications service. This can be seen from the following partial equilibrium diagram which shows the (derived) demand by Australian providers for the service, D, in relation to the LRMC of provision. Although the diagram focuses on effects at the provider level, the effects are likely to be at least of the same magnitude at the final consumer level if there are no other factors influencing prices to consumers.

To simplify the analysis, it is assumed that LRMC is constant. In this situation, there is no need to raise prices above LRMC to recover total costs, as LRMC and long run average cost are the same.

In the diagram, the price charged to providers, P^1, is associated with quantity demanded by and supplied to providers of Q^1. Had the efficient price, P^0, been charged, the quantity demanded and supplied would have been higher at Q^0.



One welfare loss of charging price P^1 is the excess of the foregone value to Australian providers who would have purchased more of the service at the long run marginal cost of providing it. This is represented by triangle A.

Depending on the source of supply, the additional expenditure made by Australian providers to purchase the service at price P^1, represented by rectangle B, may also be a welfare loss.

- If foreigners provide the service, rectangle B accrues to them and, thus, is a transfer to foreigners which is not available for Australians to use in other activities. In this case, rectangle B also represents a welfare loss.
- If Australians provide the service, rectangle B accrues to Australians and is, thus, not a welfare loss, but a domestic transfer. How the cost of rectangle B is finally distributed between Australian providers purchasing the service and final consumers will depend on the responsiveness of consumer demand with respect to price (or price elasticity) or on the degree of competition.

Thus, the total welfare loss to Australia of paying price P^1 under a payment arrangement is the sum of triangle A and rectangle B in the case of foreign supply, and only triangle A in the case of Australian supply.

Until recently, above cost settlement rates also continued to be a problem on routes between Australia and other liberalised countries. This can be seen using price and

cost data from TeleGeography (1998) for an international call from the United States to Australia (see the table in box 4.4). The settlement rate for terminating a call in Australia was 15 US cents per minute in July 1998. However, the per minute cost of terminating a call in Australia — assuming this was the same as the Australian interconnection rate (1.6 US cents per minute) and half circuit cost (0.3 US cents per minute) — was 1.9 US cents per minute. Thus, the settlement rate was about eight times the cost of call termination.

However, the problem of above cost settlement rates on liberalised routes is declining in significance. As Global One Communications said:

> Due to the liberalisation of the Australian market and those of its primary correspondents (USA, New Zealand, Japan, Hong Kong/ISR, EU), the issue of excessive settlement rates and subsidisation of foreign carriers/users has substantially eased. (Sub. 13, p. 2)

An exceptional case where settlement rates may not exceed costs relates to mobile services. Ovum observed that, where an international telephone call is destined to a mobile subscriber, the settlement rate is 'not usually enough to cover both the cost of the mobile operator's domestic termination rate and the cost incurred by the international facilities operators' (1998,p. 23). As noted in chapter 3, the accounting rate system does not differentiate between calls to (or from) mobile subscribers and calls to (or from) public switched telephone network (PSTN) subscribers.

From an Australian provider's viewpoint, such divergences between settlement rates and costs only matter if there is a traffic deficit on a route; that is, the outgoing traffic from Australia on a route is greater than the incoming traffic. For example, Telstra expressed concerns about the settlement rates that it has with India, Sri Lanka, Pakistan, Nepal, the Middle East countries and Russia because they are 'significantly above cost and because there is a net outflow of traffic from Australia to these countries' (sub. 4, p. 18).

Indirect evidence

Refile

Refile may be regarded as indirect evidence of inefficient pricing of the accounting rate system. As explained in chapter 3, it involves the rerouting of traffic between two countries through a third country to exploit settlement rate differences.

Box 4.4 **Comparing the cost to a provider of different payment arrangements**

A US provider has generally four basic methods of carrying a call to Australia:

- settlement with the Australian provider;
- interconnection with the Australian provider;
- international simple resale; and
- service resale.

Using Telegeography's data on price/cost elements of an international call from the United States (Washington DC) to Australia in the table on the next page, it is apparent that the cost of carrying a call to Australia for the US provider varies according to the method used.

Settlement with Australian provider

To switch a call from the customer's telephone to its own long distance network, the US provider first pays the local exchange provider in Washington DC an origination fee of 1.8 US cents per minute. The provider than moves the call along a 'backhaul' route; that is, from its national network to the undersea cable landing station. The provider shifts the call onto the international 'half circuit' it owns, then pays the Australian provider a settlement fee to transfer the call onto its matching half circuit and to the final destination. The US provider's marginal cost of using its own backhaul and international half circuit is 0.3 US cents per minute. The settlement rate for the Australian-end of the call is 15 US cents per minute. The total cost to the US provider of the call is 17.1 US cents per minute.

Interconnection with Australian provider

Foreign providers can interconnect directly with Australian facilities. Rather than financing a half circuit and paying the settlement rate, a US provider can purchase a whole circuit all the way to an international gateway in Australia, which costs 0.6 US cents per minute, then pay an Australian provider 1.6 US cents per minute to switch and terminate the call. The total cost to the US provider of the call (which includes their own origination and backhaul costs) is 4 US cents per minute.

International simple resale

A provider is not required to own its own circuits. Instead, it can switch traffic onto US-Australia private lines leased from other providers. Total cost to the US provider of the call including origination, private line lease and interconnection in Australia is 11.6 US cents per minute.

(Continued on next page)

Box 4.4 **(Continued)**

Service resale

To offer its customers access to Australia, the US provider can purchase the minutes carried over another provider's network in bulk and market those minutes as its own. The two charges required for end-to-end service resale include 4 US cents for origination and US domestic long distance and 7 US cents per minute for the international carriage and termination. Total cost is 11 US cents per minute.

Price and cost elements of an international call from the United States to Australia (US cents per minute, July 1998)[a]

	Origination cost or price (US end)	Half circuit cost (US end)[b]	Half circuit cost (Aus. end)[b]	Whole circuit leasing price	Settlement rate[c] (Aus. end)	Inter-connection rate (Aus. end)[d]	Whole-sale rate	Total
Retail price[e]								47.0
Payment arrangement								
Settlement	1.8	0.3	-	-	15.0	-	-	17.1
Inter-connection	1.8	0.3	0.3	-	-	1.6	-	4.0
ISR	2.7	-	-	7.3	-	1.6	-	11.6
Wholesale for resellers	4.0	-	-	-	-	-	7.0	11.0

[a] Some elements in the table reflect long run marginal costs, some elements are prices charged. [b] Refers to international circuits. Costs per minute calculated assuming that each 64kbps circuit is compressed at a 5:1 ratio and is used for ten years and that each voice path is used for four hours a day. [c] Settlement rates are for peak rate traffic terminated by the largest Australian provider. Includes the cost of carrying a call along a 'backhaul route'; that is, from the national network to the undersea cable landing station. [d] The interconnection rate used by Telegeography differs from Telstra's 1997 price undertaking for originating and terminating access services to the ACCC. [e] Retail prices are based on MCI One International Calling Plan.

Source: TeleGeography (1998, pp. 59, 61).

Accurate estimation of the extent of refile is difficult, in part, because of the unwillingness of some providers to volunteer this information. (However, Telstra stated in its annual report for 1997-98 that it engages in refile — see Telstra 1998, p. 6.) Refile is not permitted under ITU Recommendations and Regulations. Ovum, however, reports estimates of refiled traffic consisting of between 10 and 30 per cent of global traffic (Ovum 1998, p. 148).

The US Federal Communications Commission's (FCC) settlement rate benchmarks, adopted in 1997 and phased in from 1January 1999, could promote greater refile of traffic. There are two possible sources:

- from US providers unable to provide a direct service to a benchmarked country if providers in that country were to refuse to terminate incoming traffic from the United States at the lower benchmark rate; and
- from providers in other countries seeking to exploit the benchmark rates.

Although refile is commonly described in the context of providers exploiting differentials in settlement rates on different international routes, it may also occur as a means of exploiting differentials between domestic charges (such as for terminating to mobiles and for carriage of data) and settlement rates. For example, Ovum observed that high rates for terminating domestic calls to mobiles have created an incentive for providers, particularly in New Zealand, Sweden and the United Kingdom, to engage in mobile refile:

> Operators that refile [national originating] calls, carry it to another country and reoriginate the call back into the first country, [thus] passing the call to the incumbent fixed network operator under the conventional accounting rate system. The total cost to the refiling operator is the settlement payment in either direction plus its network costs. ... This can be lower than the charge it would have to pay for terminating the call under the normal domestic arrangement. (Ovum 1998, p. 235)

A major effect of refile is to place pressure on terminating providers to lower settlement rates. Cable & Wireless Optus asserted that, as a result of refile, between 1997 and 1999, prices for terminating calls from Australia to China and Pakistan have fallen by 50 per cent and to India by 10 per cent (sub. 5, p. 14).

Callback

Another example of indirect evidence of inefficient pricing of the accounting rate system is callback. Callback arises because of differentials in retail and wholesale prices and involves the joining of two calls by a callback operator: one from the operator to the calling party, the other from the operator to the called party (see chapter 3).

Callback is reported to be globally insignificant, but growing particularly in monopoly markets. Kelly (1996) reported industry estimates of one per cent of global traffic in 1995. He also noted that callback traffic increased tenfold since 1993. Ovum has recently reported in similar terms (Ovum 1998, p. 140).

Callback has various effects. One major effect is that it reverses traffic flows, particularly between competitive and monopoly markets (FCC 1996, para 12). An

example of such a shift in traffic occurred in Hong Kong, where callback is legal but there is a monopoly provider. Over a period of 18 months, traffic between the United States and Hong Kong shifted from a balance of one to one to an imbalance in October 1996 of seven minutes of outbound traffic from the United States to Hong Kong for every minute of inbound traffic from Hong Kong to the United States (FCC 1996, para 12). Such reversals in traffic flows can further affect the settlement payments of countries with callback operators, such as the United States.

Another effect of callback is that it places pressure on the prices to final consumers charged by dominant or incumbent providers as the prices charged by callback operators are generally lower. For example, for certain Australian routes, callback operator prices were approximately 36 to 85 per cent of the standard prices charged by Telstra in 1997 (OECD 1997, table 7). The OECD observed that:

> A number of operators [such as Telintar in Argentina] have begun to reduce international prices for telephony and have begun to introduce volume discounts for large customers in order to recapture traffic that they have lost to callback operators. (OECD 1997, p. 26)

Xavier has also attributed Singapore Telecom's 'sharp price decreases' in recent years, despite having legislative monopoly status for the ensuing decade, to competition from callback operators (Xavier 1997, p. 229).

Internet telephony

Growth in the use by providers of Internet telephony (or voice over Internet Protocol) may also be considered indirect evidence of inefficient pricing of the accounting rate system. Internet telephony involves the transmission of international (and domestic) voice calls by means of Internet Protocol (see box 2.2).

Internet telephony permits Internet service providers (ISPs) and others to bypass the accounting rate system and take advantage of the lower payments involved in accessing the Internet. As Ovum said:

> Internet messages are sent to all destinations for the same fixed charge to the originator. The only ongoing cost incurred by the originator is for contacting the Internet access node — typically the cost of a local call. Internet service providers are using this as a way of bypassing accounting rates, allowing international calls for the price of a local call. (Ovum 1998, p. 13)

Telstra said:

> As a phone to phone substitute ... most observers agree that [Internet telephony] will exploit a finite 'arbitrage' opportunity in certain markets created by high retail international tariffs and high interconnection/termination charges. [Internet telephony]

> allows the bypass of international carrier termination rates, especially in protected/regulated markets. (Sub. 4, p. 13)

At this time, because of its inferior voice quality, Internet telephony does not appear to be a significant threat to traditional means of voice call transmission. Telstra estimated that around 360 million minutes of voice calls are being carried over the Internet Protocol, equivalent to about five per cent of total international voice minutes (sub. 4, p. 13). The ACA, however, said:

> [the inferior speech quality] will be quickly overcome, and [Internet telephony] currently represents a significant driver to reduce carriage costs, for both new and established providers. As quality increases, the divergence of costs and prices might be expected to close up significantly. (Sub. 7, p. 7)

Anti-competitive behaviour by foreign providers

The combination of above cost settlement rates and asymmetries between providers in terms of the degree of competition they face in their home markets may contribute to anti-competitive behaviour. If there is asymmetry in competition, there may be an incentive for providers whose home market is closed (foreign monopolists) to engage in anti-competitive behaviour in markets open to competition to acquire a greater share of the rents from above cost settlement rates.

The main forms of anti-competitive behaviour are whipsawing, one way bypass and predatory pricing (see box 4.5). These forms of behaviour can impose welfare losses on the community with the competitive market because they involve:

- in the case of whipsawing and one way bypass, revenue transfers from competitive providers to foreign monopolists, which is not available for competitive providers to use in other activities; or
- in the case of predatory pricing, the long term risk of price increases to final consumers in the competitive market.

Such behaviour can be dealt with by regulators in various ways, for example, in Australia under Rules of Conduct for dealings with international operators and the general anti-competitive provisions of the Trade Practices Act.

Evidence of the incidence of these behaviours in the Australian market is not clear. DOCITA was of the view that the Rules of Conduct have acted as a sufficient deterrent to such conduct (sub.6, p. 36).

Box 4.5 **Types of anti-competitive behaviour by foreign providers**

Whipsawing occurs when a foreign monopolist uses its bargaining leverage against particular providers from competitive markets (competitive providers) to acquire a greater share of the stream of rents flowing from the accounting rate system by reducing the settlement rates it pays and/or by increasing the settlement rates it receives for call termination services. Where a traffic imbalance in favour of the competitive market (or monopoly market) arises, competitive providers would receive (or make) lower (or higher) settlement payments and thus experience reduced revenues. The extra revenue transferred to the foreign monopolist under whipsawing is effectively a welfare loss to the community with the competitive market; the extra revenue is no longer available to the competitive provider to use in other activities.

One way bypass occurs when a foreign monopolist either sets up an affiliate or leases a private line in a competitive market and terminates (or even refiles) its own incoming traffic. The bypass is 'one way' because competitive providers are unable to obtain equivalent entry in the foreign monopolist's home market. As a result of one way bypass, competitive providers would receive a significantly reduced number or even a cessation of incoming calls from the monopoly market, resulting in a traffic imbalance in the foreign monopolist's (or affiliate's) favour. Competitive providers would make higher settlement payments and thus experience reduced revenues. The extra revenue transferred to the foreign monopolist under one way bypass is effectively a welfare loss to the community with the competitive market; the extra revenue is no longer available to the competitive provider to use in other activities.

Predatory pricing occurs when a foreign monopolist uses the revenues it receives from terminating calls at above cost settlement rates to subsidise the predatory pricing strategy of an affiliate in a competitive market. Predatory pricing is a short term strategy which involves the affiliate setting its prices to consumers below the cost of provision which other providers cannot match without losing revenues. In principle, it could lead to the other providers exiting the industry, thereby allowing the affiliate to raise its prices in the longer term.

The actions of regulators

Since the early 1990s, national regulators have responded to concerns and perceived problems about the accounting rate system in a number of ways. Their responses, in themselves, provide indirect evidence of inefficient pricing of the accounting rate system.

In relation to the level of settlement rates, the most notable action to date has been by the US FCC. In a 1997 Order, the FCC unilaterally capped the settlement rates that US providers can pay to foreign providers through the imposition of benchmarks. As noted in chapter 3, the benchmark rates vary according to the level of country income (measured by Gross National Product per capita) and are being

phased in over a four year period beginning 1 January 1999. More information about this action is given in appendix A.

Various actions have also been implemented to deal with any anti-competitive behaviour of foreign monopolists. Examples of regulatory responses in Australia and the United States are given in box 4.6.

An issue is the extent to which the potential benefits from such regulatory responses are undermined or outweighed by any resulting inefficiencies. For example, although proportionate return is intended to address whipsawing, it may deter new entry into the international telecommunications market. As Ovum noted:

> The operation of proportionate return ... acts as a barrier to entry to new carriers, because it favours established operators by guaranteeing them a flow of return traffic. (Ovum 1998, p. 165)

Similarly, parallel accounting may constrain prices to levels that are above what would tend to occur in a competitive market. Again, Ovum said:

> This is because a lower [settlement rate] offered to one party would immediately be available to all other parties. In such circumstances, no operator will reduce its rate, since it would not result in a compensatory gain in market share. Parallel accounting therefore prevents operators competing on price to attract terminating traffic. (Ovum 1998, p. 166)

Telstra expressed concerns about the effects of 'inflexible regulatory arrangements'. Specifically, it considered that requirements for:

- prior approval of the national regulator to any changes in settlement rates would result in delays and provide a barrier to foreign providers agreeing to changes;
- bilateral agreements to be filed with the national regulator would provide an administrative barrier to providers agreeing to rate reductions and may make them reluctant to do so because of concerns about confidentiality; and
- parallel accounting and proportionate return would effectively prohibit foreign providers from entering into new more commercially orientated arrangements (sub. 4, p. 12).

Other responses

Participants and various commentators referred generally to other types of provider responses which could, in certain circumstances, be taken as indirect evidence of inefficient pricing of the accounting rate system (see, for example, DOCITA sub. 6, p. 28; Telstra sub. 4, pp. 12–13; Leive 1997; and Ovum 1998).

Box 4.6 **Regulatory responses to anti-competitive behaviour of foreign providers**

Australia

The ACCC may deal with the anti-competitive behaviour of foreign monopolists under Rules of Conduct for dealings with international operators prepared by the Minister in accordance with Part 20 of the *Telecommunications Act 1997*. The object of the Rules is to prevent 'international telecommunications operators' from engaging in 'unacceptable conduct' in Australia.

'Unacceptable conduct' is the use of market power or any legal rights or legal status, or any other conduct, in a manner that is, or is likely to be, contrary to Australia's 'national interest'. No examples of what constitutes unacceptable conduct are given either in the Rules or by the ACCC.

The Rules provide, among other things, that:

- providers operating in Australia 'use all reasonable endeavours to prevent, mitigate or remedy unacceptable conduct' engaged by the international operator;
- the ACCC can request information from an Australian provider or international telecommunications operator about agreements in relation to charges or telecommunications traffic;
- the ACCC may direct an Australian provider to:
  - make an agreement with an international telecommunications operator on specific charges for an international service dealt with under the agreement; or
  - make an agreement with an international telecommunications operator in relation to allocating all or part of latter's traffic to providers in a particular manner; or
  - act in its dealings with an international telecommunications operator in a particular manner to prevent, mitigate or remedy unacceptable conduct engaged in by the operator;
- if the agreement (or a provision of the agreement) is inconsistent with the Rules of Conduct it becomes unenforceable. In addition, providers (carriers) are effectively in breach of a licence condition and, thus, subject to pecuniary penalties of up to $10 million upfront plus $1 million for each day that the breach continues to occur.

There is potential overlap between the Rules and the general anti-competitive provisions of the *Trade Practices Act 1974*. For example, if an international telecommunications operator has assets in Australia and was behaving anti-competitively, the ACCC could apply the Trade Practices Act provisions, rather than the Rules. However, only the Rules could apply where international telecommunications operators had no assets in Australia.

(Continued on next page)

Box 4.6 **(continued)**

Up to the time this report was finalised, only one complaint had been lodged under the Rules. As the complainant did not substantiate its complaint, ACCC took no further action (sub. D20, p. 4). DOCITA said that:

> in the absence of [such action], DOCITA would have to assume that no foreign policies were having the effect of supporting anti-competitive conduct in the Australian market. (Sub. 6, p. 36)

United States

The FCC deals with the anti-competitive behaviour of foreign monopolists through its International Settlements Policy and through its 1997 Order on benchmark settlement rates.

The International Settlements Policy addresses whipsawing by requiring equal division of accounting rates, non-discriminatory treatment of US providers, proportionate return of inbound traffic and parallel accounting. The need to comply with the Policy was recently lifted in relation to arrangements between US providers and foreign non-dominant providers on competitive routes. Although the FCC considered Telstra to have market power in the Australian market, Telstra is not subject to the Policy because the Australia-US route is an approved International Simple Resale (ISR) route and the company operates ISR agreements with US providers (sub. D18, p. 4).

The 1997 Order addresses one way bypass and predatory pricing (described in the Order as 'price squeeze') through benchmark settlement rates. The FCC deals with one way bypass by permitting a foreign provider to offer services over international private lines only if at least half of the traffic on the route in question is settled at rates at or below the relevant benchmark. The FCC deals with predatory pricing by requiring all US providers to pay the foreign provider no more than the relevant benchmark rate.

Source: DOCITA (sub. 6); ACCC (sub. 10); and appendix A.

These responses have included:

- investment in new capacity;
- leased line resale (also known as private line resale or international simple resale);
- international alliances of operators; and
- interconnection.

However, there has been no evidence presented to the inquiry of specific examples of these responses, particularly in relation to Australian providers, which could be directly attributed to above cost settlement rates.

4.4 Evidence of inefficient pricing: payments for facilities

The main payment arrangements assessed here relate to interconnection to the domestic PSTN, leasing of international cable capacity and access to 'backhaul'.

Direct evidence

Interconnection

There is direct evidence that prices for interconnection to Telstra's PSTN in Australia are not reflective of underlying costs.

Telstra lodged a price undertaking with the ACCC in 1997 for originating and terminating access services to its PSTN. The ACCC assessed the average usage-based price of 4.73 cents per minute in the undertaking to be at least two times total service long run incremental cost (TSLRIC). (The ACCC also assessed this price against historical cost and international price benchmarks.) TSLRIC was estimated at between 1.87 and 2.77 cents per minute, depending on trench lengths. It consisted of:

- between 0.45 and 1.10 cents per minute contribution to the residential 'access deficit' on the customer access network (CAN) — the difference between residential 'non call-related costs', such as line related costs, and residential 'non-call related revenues', such as line rental and connection revenues; and
- between 1.42 and 1.67 cents per minute 'call conveyance' costs (ACCC 1999a, p. 72 and box 4.2).

Although the ACCC noted the argument that it was efficient to recover costs of the CAN from line rentals and connection charges (and thus obviate the need for including a contribution to the access deficit in the cost base for assessing Telstra's price undertaking), it said:

> to the extent that Telstra is constrained from increasing line rental and connection charges by retail price cap regulations and does incur an access deficit on recovery of the efficient costs of the CAN, then it must recover these costs from call revenues. This includes some or all of local calls, long distance calls, toll-free calls, fixed to mobile and mobile to fixed calls ... (ACCC 1999a, p. 49)

The ACCC thus decided that, given retail price controls applying until 30 June 1999, it would include a contribution to Telstra's residential access deficit in its cost benchmark. The ACCC did not form a view on whether Telstra would be able to

increase line rental and connection charges to fully recover line-related costs under new retail price controls to apply from 1 July 1999 to 30 June 2001. It stated, however, that it will give further consideration to how the access deficit should be treated under the new controls (ACCC 1999a, p. 52).

Leasing of lines

There is direct evidence to suggest that the prices for leasing international cable capacity exceed underlying costs. Telegeography (see the table in box 4.4) estimated the price for leasing a whole circuit between Australia and the United States in July 1998 at 7.3 US cents per minute compared with a cost of 0.6 US cents per minute; thus, the price is about twelve times that cost.

Also, it is possible to infer that prices are not cost-based from data collected recently by the OECD on pricing differences between countries for leasing similar capacities and lengths of cable. The data show that (OECD 1999, p. 189):

- for domestic leased line prices in 1998, the United States and Australia were, respectively, 68 and 6 per cent below the OECD average, whereas Japan and New Zealand were, respectively, 13 and 8 per cent above the OECD average; and
- for international leased line prices in 1998, Australia and Japan were, respectively 116 and 35 per cent above the OECD average, whereas the United Kingdom and the United States were 18 and 16 per cent, respectively, below the OECD average.

Telstra, however, considered that the OECD data are 'skewed towards shorter routes pricing and also towards countries which have better economies of scale' (sub. D19, p. 2).

Backhaul

Some participants commented on pricing inefficiencies associated with access to backhaul; the inland private circuit between a cable landing station and a domestic provider's switch. Global One Communications noted that:

> In Australia ... Global One amongst others is compelled to pay exorbitant Telstra prices for backhaul transmission as such transmission is non or weakly contested. Similarly, in a number of other jurisdictions, where Global One operates, the incumbent monopolist control over the last access/transmission mile(s), often means that any competitive advantage in wet transmission is soon eroded by the monopoly pricing of dry, backhaul transmission. (Sub. 13, p. 2)

Indirect evidence

Practical restrictions in purchasing international capacity from cable consortia

Although legal restrictions in purchasing capacity from traditional cable consortia such as through IRUs have been lifted in many countries, in practice, availability to non-members can remain restricted. The restricted availability arises because of the internal requirements imposed by consortia members on the purchase of capacity as well as limited capacity available for purchase. Ovum said:

> [Carriers who are] co-owners or [existing consortium members] have had opportunities to buy capacity as Minimum Investment Units, and can buy common reserve capacity from the consortium. Co-owners are able to purchase whole capacity circuits. ... carriers that are not co-owners face restrictions on the capacity they may acquire, and a pricing policy that may have little relation to the economic value of the asset they are acquiring. In addition, they have to persuade two operators to sell them matched capacity, and neither operator may be prepared to sell without the prior agreement of the other. (Ovum 1998, p. 170)

TeleGeography also noted the restrictiveness of consortia rules that require non-members to purchase international cable capacity in the form of IRUs rather than more short term (and cheaper) property rights (TeleGeography 1998, p. 93).

However, given the current growth in investment in new cable capacity and the emergence of new cable consortia, such practical restrictions are likely to become less important.

Investment in new cable capacity

The combination of continuing high pricing of, and practical access restrictions to, existing capacity have created incentives for new international cable investment by providers, including by those not originally from the telecommunications industry. Ovum offered the following investments as examples:

- the Fibre Optic Link Around the Globe (FLAG) — a 27000 km cable commissioned in 1997, linking Europe, the Middle East and Asia and costing $US1.5 billion with most of the funding coming from non-telecommunications sources;
- FLUTE — a plan for a submarine cable system linking the United Kingdom, Belgium and the Netherlands; and
- Hermes Europe Railtel — a joint venture between Global TeleSystems Group (a US telecommunications provider) and Hit Rail BV (a Dutch company which is owned by a consortium of 11 European rail operators) (see Ovum 1998, p. 146).

Telstra, however, has argued that investments such in the TAT 12/13 cable, the TPC-5 cable, the Southern Cross cable and in the SE-ME-WE-3 cable are not examples of responses to excessive pricing or practical access restrictions, but of strong demand growth:

> Surely, what we are seeing here is not inefficiency but rather the market at work – that is, the response of supply to strong and sustained growth in demand. (Sub. D17, p. 3)

4.5 Evidence of inefficient pricing: payments for Internet traffic

As noted in chapter 3, there are many different types of payment arrangements between ISPs. The main payment arrangement examined here is between major ISPs (that is, backbone providers) outside of the United States (such as Telstra) and major ISPs in the United States (such as UUNet). This payment arrangement includes payments by non-US ISPs to US ISPs for leasing their half circuits and for 'port charges' (which may be regarded as charges for interconnection with backbone networks). US ISPs make no such payments to non-US ISPs.

This payment arrangement has arisen because of the ability of a few large US ISPs to exert market power over international access to major US backbone networks. This market power is not surprising given the history of the development of the Internet, which begins with substantial investment by the US Government and includes the early adoption of peering arrangements. Telstra said:

> the market power of the larger USA Internet networks vis a vis non USA operators is reinforced by the structure of Internet interconnections which developed originally in the USA. This structure reflects not only the nature of Internet technology but also the lack of any agreed transactions or payment systems between major backbone providers. … At the moment, given the continued preponderance of the USA as both a source and destination of Internet traffic and the effective absence of international cost transfers to USA operators, there is little pressure on the USA operators to change current arrangements with non USA operators. (Sub. D18, p. 3)

Assessment of the payment arrangement requires identifying the services provided under the arrangement that are demanded by, or benefit, a customer ISP as well as the relevant prices and underlying costs. The services include the provision of capacity (or bandwidth) to facilitate the transport of Internet traffic to and from the ISP and interconnection with the ISP's backbone network, but not content as this is generally demanded by, or benefits, the original sender or final recipient of Internet traffic.

Direct evidence

There are pricing inefficiencies in the payment arrangement to the extent that prices (or the absence of prices) charged for the services provided to customer ISPs do not match underlying costs or reflect the benefits received.

- Non-US ISPs are paying for capacity to enable the transport of traffic from which they do not benefit — they pay for capacity required to send and receive all traffic to and from the US. (Conversely, US ISPs are not paying for capacity to enable the transport of traffic from which they benefit.)
- US ISPs are benefiting from interconnection with backbone networks in other countries for which they do not pay 'port charges'.
- Flat pricing structures in US 'port charges' to non-US ISPs may not reflect the costs of any congestion that the latter impose on other customers (see later for evidence of congestion). (However, some backbone providers such as Telstra, UUNet and NZGate, do charge on a usage basis, for example, on a per bit, byte or packet received or sent.)

Determining the degree to which ISPs benefit from Internet traffic is complex. At this time, ISPs do not have in place a system to track and determine the nature of traffic. The APEC Telecommunications Working Group noted:

> in the case of the Internet as currently constituted, ISPs have lacked the resources to track traffic and cost causation and, until now, have had little incentive to devise metering and tracking systems. (APEC 1999a, chapter 3, p. 2)

Simply observing the direction of traffic flows may not be enough.

First, an ISP may generate substantially more outbound traffic than inbound traffic as a result of external file transfer requests and World Wide Web visits to sites located on, or accessible through, its network. The APEC Telecommunications Working Group said that 'a more complete examination of the ... transaction would show that the US ISP has responded to an initial request for service originated via another ISP' (APEC 1999a, chapter 3, p. 2).

A second complication is the 'push and pull' nature of traffic. As Nelson (1998, p. 478) noted, 'a question arises as to who is responsible for payment of data automatically sent by Internet sites whether or not the user seeks it'. Examples include unsolicited advertising banners.

Another complication is the seemingly random pattern of routes that traffic may take. The OECD noted:

> If the traffic flowing between [a] ... country and the United States was contained within a single international link and the geographical borders of both countries a model for

> sharing infrastructure costs might be self evident. However, the Internet does not transport traffic in such a precisely defined or bounded way. Not only might IP packets travel along different paths, traversing different countries, but so might the routing information drawn from global root servers. (OECD 1998, p. 37)

It is also not appropriate to presume there is symmetry in the benefits between non-US ISPs and US ISPs. The APEC Telecommunications Working Group said:

> The balance of utility has skewed heavily to the United States, because of the attractiveness of what US sites have to offer and because the ISPs seeking access historically have had less to offer by way of both networking facilities and number of Web sites. (APEC 1999a, chapter 3, p. 4)

Telstra acknowledged that the Australian benefit of 'Internet connection' to the United States is higher than that for United States to Australia and, accordingly, the traditional half circuit sharing formula governing the transmission of voice calls should not automatically apply. It estimated the delineation of benefits as 20 to 30 per cent to US ISPs and 70 to 80 per cent to Australian ISPs (sub. 4, p. 15).

Despite the complexities noted above, some work is currently being undertaken within the industry to develop a billing system standard. Press reports indicate that 19 of the world's major providers of telecommunications services met in California recently to develop an Internet billing standard, which is to be called the Internet Protocol Detail Record. They intend to finalise development of the standard by the end of 1999 and to present the result to the appropriate standard setting bodies (Australian Financial Review, 5 August 1999, p. 28).

Indirect evidence

Investment in cables and port facilities

Because non-US ISPs must pay for Internet traffic to and from the United States, they have a significant incentive to reduce this payment through investment in new capacity to and port facilities in the United States. This incentive is compounded by congestion problems on the Internet due to flat rate port charges (see below) as well as by the pricing differentials involved in leasing existing cable capacity (and noted in section 4.4).

The extent to which non-US ISPs are responding in this way is indirect evidence of inefficient pricing of the payment arrangement.

Australian providers such as Telstra have been making substantial investments in recent years in new (largely cable) capacity to, and port facilities in, the United

States. Telstra has expanded its international network for Internet carriage significantly over the last five years; its total capacity to the United States increased from 1.5 Mbit/s to 280 Mbit/s between 1994 and 1999 and is estimated to increase to over 4 Gbit/s by 2003 (sub. 4, p. 3). As noted in box 2.3, Telstra is giving particular focus to extending its network into the Palo Alto Internet Exchange by investing $50 million in adding capacity and establishing a router in conjunction with other regional providers.

Alternative routing strategies

The implementation of alternative routing strategies by non-US ISPs is also indirect evidence of inefficient pricing of the payment arrangement in relation to both acquiring international cable capacity and interconnection.

'Hot potato' routing is a strategy whereby a non-US ISP finds a site provided by another ISP for low cost offloading of traffic and transportation over a long haul to the final destination. The APEC Telecommunications Working Group said:

> In the worst case scenario, an ISP in the Asia Pacific region might secure access to the rest of the world courtesy of one or more US ISPs and via one peering point [which] the Asia Pacific ISP accessed via selfprovisioned international private lines. While seemingly burdensome to force selfprovisioning the ability to access the rest of the world via other ISP facilities presents quite a bargain, particularly in light of comparatively cheap private line rate for access to the United States relative to other points. (APEC 1999a, chapter 3, p. 5)

The OECD observed that European countries with less expensive trans Atlantic prices may be the points of departure for ISPs with trans European networks to 'aggregate' international traffic; for example, UUNet's largest connections between Europe and the United States are from the United Kingdom (OECD 1998, p. 39).

The rerouting of domestic and/or intra-regional Internet traffic by way of the United States may also occur. The OECD reported that more than half of intra-European and intra-Asian traffic is transported by way of the United States (OECD 1998, p. 10).

Various commentators (such as the APEC Telecommunications Working Group and the OECD) attributed this rerouting to the relatively high cost of domestic leased lines and interconnection in non-US countries. For example, the OECD noted:

> that it is often less expensive for European ISPs to purchase trans Atlantic capacity, to traffic exchange points in the United States, than to purchase equivalent trans European capacity to European Internet exchange points. (OECD 1998, p. 39)

Recent data from the OECD, referred to in section 4.4, support these observations.

Congestion

Congestion, particularly at the point of international interconnection, may be indirect evidence of inefficient pricing of the payment arrangement and, in particular, of flat pricing structures. Congestion can manifest itself as either a traffic loss (a packet does not reach its destination) or a traffic delay (Nelson 1998, p. 464).

Various commentators have referred to anecdotal evidence of congestion. For example, MacKie-Mason and Varian (1997, pp.41–2) said:

> many services on the Internet have experienced severe congestion problems. Large FTP archives, Web servers at the National Centre for Supercomputer Applications, the original Archie site at McGill University, and many services have had serious problems with overuse. ... Congestion on the trans-Atlantic link, which has been only 6 megabits per second, has been quite severe, causing researchers who require substantial bandwidth to schedule their work during the wee hours. Since the advent of WWW and CU-SeeMe video-conferencing, there has also been seriously disruptive congestion in Europe. Indeed, for a period beginning in 1995, EUnet (the main European Internet backbone) forbade the use of CU-SeeMe without advance permission.

Telstra considered that the absence of an 'international payment mechanism' for traffic carriage to be a major cause of congestion in the Internet. It said that:

> The international telephony system however distorted and inefficient it may have been, provided good rewards for successful calls and none for failed calls, encouraging operators to dimension for peak usage. The Internet, operating under a 'best efforts' service paradigm, provides far less rewards for units of traffic carried, no direct penalties for dropped packets, hence less direct incentive to invest in increased network capacity. A range of technological solutions has been developed for the problem of quality of service but it is difficult to see how these can be deployed across multiple networks in different geographies without an inter-provider payment system. (Sub. D17, pp. 6–7)

4.6 Summing up

There is various direct evidence of 'distortions or mispricing' or inefficient pricing of payment arrangements:

- the settlement rate charged by Australian providers for terminating a call from the United States is about eight times TeleGeography's estimate of the cost of call termination;
- settlement rates paid in respect of traffic to and from other countries also greatly exceed underlying costs;

- Telstra's price for interconnecting to its PSTN is at least two times the ACCC's estimate of the efficient cost of providing the service (which includes a contribution to the 'access deficit' as well as the cost of 'call conveyance');
- the price of leasing a whole circuit between Australia and the United States is about twelve times TeleGeography's estimate of underlying cost;
- various aspects of the payment arrangement applying to Internet traffic between the United States and other countries exhibit pricing inefficiency in that non-US ISPs are paying for capacity to enable the transport of traffic from which they do not benefit, and US ISPs are benefiting from interconnection with backbone networks in other countries for which they do not pay 'port charges'.

The existence of this broad range of pricing inefficiencies has influenced the competitive and investment behaviour of providers. Providers have sought to minimise the cost of pricing inefficiencies on themselves and have continued to exploit remaining available market power. Although such 'second-best' behaviour is rationally-based it does not lead to an allocation of resources which maximises community-wide welfare; indeed, inefficient prices may impose welfare losses on the community.

Although there is considerable evidence of the competitive and investment behaviour of Australian providers in international telecommunications markets around the world, it is difficult to link this behaviour directly to inefficient pricing of payment arrangements. Other motivating factors may be at play such as providers availing themselves of new opportunities arising from market liberalisation, technological change and growth in demand.

To the extent to which there is inefficient pricing of payment arrangements, there are thus benefits to be achieved from reforms. Chapter 5 quantifies the benefits from reforms of the payment arrangements. Chapter 6 considers further reform issues and options.

5 Quantifying reform benefits

The terms of reference request the Commission to examine and report on 'community benefits from reform of settlement arrangements, examining both the domestic and international components of the international telecommunications market'.

In the past few years, the Australian community has begun to benefit from changes in the regulatory settings for international telecommunications. A number of factors are contributing to the benefits.

- Liberalisation of market access in many countries (including Australia from 1 July 1997) is breaking down previous monopolisation of supply.
- Changes by regulators in particular countries to the settlement 'rules' have facilitated competition, for example through asymmetric and differential settlement rates. Similarly, some countries have recently allowed different payment systems such as international simple resale.
- As a consequence of market liberalisation and rule changes, it is also becoming easier for providers to moderate the effects of the traditional settlement arrangements in traffic with non-liberalised markets.

These benefits are coming about even though little internationally coordinated institutional change in the international settlement arrangements themselves has been implemented (although there has been much discussion of the need for such reform and, in June 1999, the ITU adopted some recommendations which could assist future reform — see section 6.2 in chapter 6).

At present, however, some problems remain, for example in respect of traffic with non-liberalised markets, interconnection prices and Internet traffic (see chapter 4). Even for traffic with liberalised markets, accounting rates and other forms of payment can still be higher than cost. Accordingly, benefits could be obtained from further reform.

This chapter concentrates on the benefits from reform, experienced at the provider level. However, it is important to recognise that the benefits which providers may obtain do not necessarily flow through to users. For example, as reported further in chapter 6, there is some evidence that benefits have not flowed through to users of dedicated links or data services.

5.1 Benefits from reform

Chapters 2 and 3 present information about such changes as:

- reductions in accounting rates;
- growth in telecommunications traffic;
- the development of new forms of traffic such as international simple resale;
- greater freedom for providers to invest in other countries and to establish alliances; and
- expansion in availability of international cable links.

Not all such changes can necessarily be taken as indicators of the benefits of reform in international telecommunications — much of the growth in traffic volumes, for example, arises from technological change and the globalisation of economies. Further, such simple indicators do not provide information about whether the *net* economic welfare benefits could, or should, have been greater. Some issues complicate the analysis, for example:

- when Australia sends less traffic to a particular country than it receives, a reduction in the accounting rate would reduce Australian providers' revenue;
- some of the changes may just transfer revenue from one sector of the Australian community to another (see box 4.3 in chapter 4); and
- excess costs can increase if the underlying costs of international telecommunications fall more quickly than accounting rates.

Accordingly, a comprehensive assessment of reform benefits needs a measure which takes into account changes in prices, changes in traffic, and changes in costs.

Such comprehensive measurement does not appear possible. Quite significant changes occurred in Australian and foreign telecommunications markets during 1997 and 1998 — indeed, the consequences of these changes are still working through — and full traffic data are unavailable. Australian regulators do not collect and publish comprehensive market data. *TeleGeography 1999: Global Telecommunications Traffic Statistics and Commentary*, the most comprehensive readily available public compilation of traffic data, does not report traffic incoming to Australia. Nor are Australian settlement rates publicly available. There are also difficulties in measuring the volume of non-accounting rate traffic, such as Internet traffic (see section 4.5).

In its Position Paper, the Commission presented material which endeavoured to indicate broad orders of magnitude of benefits, and invited all interested parties to

comment on the merits of attempting any more definitive measurement on a case study basis. AAPT was the only participant which commented directly on this issue stating that 'identification of key issues and the options for reform, including achievement of those reforms, must remain as a priority to any measurement activity' (sub. D15, p. 2). After further consideration of the value of the data likely to be produced by a more detailed analysis in the context of this inquiry, the Commission has decided not to proceed further.

5.2 Accounting rate system

Prior to July 1997, the carriage of international traffic in and out of Australia was limited to a duopoly — Telstra and Cable & Wireless Optus. Lack of domestic competition for international traffic, together with the inefficiencies of the accounting rate system, led to prices well above underlying costs and a resultant significant welfare loss (net of transfers) to the Australian community. An indicative estimate of this loss for 1995-96 was given in IC (1997a) as some $375 million per annum.

However that estimate attempted to measure the welfare loss incurred through *Australian consumers* paying high prices to *Australian providers*. In contrast, the current inquiry mainly concerns prices paid (and received) by *Australian providers* to (from) *foreign providers*. This has two contrasting effects: first, the price difference at the provider level could be expected to be less than at the consumer level; second, for reasons explained in chapter 4, paying excess prices to foreigners represents a greater welfare loss to Australians than does paying excess prices to other Australians.

The Commission has only been able to estimate the revenue loss arising from paying excess prices to foreigners. Table 5.1 estimates the 1995-96 loss due to the accounting rate system at about $108 million. Spread over all outgoing traffic, this equates to about 11 cents per minute.

There are a number of caveats to these estimates:

- the traffic weighted settlement rate is an estimate based on total traffic. Although it is assumed that the average settlement rate weighted on the basis of traffic imbalances is the same, this is unlikely to be the case. Ideally, the estimates should be built up on a country-by-country basis; and
- the traffic data shown are assumed to relate to traffic settled under the accounting rate system. Even in 1995-96, traffic was beginning to move through

alternative means such as refile and callback. The effect this would have on the revenue loss estimates, however, is uncertain.

Table 5.1 **Estimated revenue loss from the accounting rate system**
(Indicative only, not definitive) (Australian currency)

Item	*1995-96 estimate*
Traffic weighted settlement rate paid to foreigners	65 cents per minute
Underlying cost (half circuit)	10.9 cents per minute
Balance of traffic	200 000 000 minutes
Revenue loss to Australia	$108 million
Total outgoing traffic	1 000 000 000 minutes
Loss per minute	10.8 cents per minute

Source: Based on data from IC (1997a).

Possible future benefits

How much of these potential benefits have been realised since 1995-96, and what benefits remain to be achieved? In answering these questions, a number of significant market-based changes since that time need to be considered:

- accounting rates have generally fallen and thus, other things being equal, the average settlement rate weighted on the basis of traffic imbalances should have fallen. This would reduce the current estimate of revenue loss;
- the underlying costs of telephone calls have fallen significantly, possibly to as low as 2.1 US cents per minute, or around 3.2 Australian cents per minute per half circuit (see the table in box 4.4). This would increase the revenue loss estimate; and
- a much greater proportion of traffic previously settled under the accounting rate system takes place under more commercially oriented arrangements. Telstra, for instance, indicated that as much as 80 per cent of its traffic is now settled at commercial rates (see section 2.2). As well, alternative means of delivery such as refile offer providers greater opportunities to balance their traffic flows with particular countries, thus reducing the extent of any settlement payments. These factors would also reduce the revenue loss estimate.

These considerations suggest that, at the provider level, much of the past revenue loss arising from the accounting rate system may have been eliminated already.

The potential benefits to be achieved from further reform of the accounting rate system may not be as low as this suggests, however.

- First, underlying costs, for transmission and possibly also for interconnection, are likely to continue to decline — unless these cost falls are matched by further price reductions, or the net traffic balance deficit decreases, the welfare loss arising from traffic remaining in the accounting rate system will increase.
- Second, as noted in chapter 4, the accounting rate system causes other possible inefficiencies in terms of investment, traffic routing, and alliances. These costs are not captured by the above estimates.

5.3 Payments for facilities

This section covers traffic for which payment is made according to the components of service supplied, such as leased lines and interconnection services. Internet traffic is covered in the next section. As discussed in chapter 2, the volume of such non-accounting rate international traffic is increasing greatly.

A full calculation of the possible benefits of reform for this type of traffic was not possible. There is limited historical and current public data about the leasing of lines (and satellite circuits), and the nature and extent of traffic flows along them. The data problem is magnified by ongoing rapid regulatory change and rapid traffic growth, particularly of the Internet.

However, as chapter 4 noted, there is evidence that some inefficiencies remain.

Leased lines

In regard to the use of circuits by providers with ownership rights, the significance of inefficiency in pricing, if any, would partly depend on the balance between the number of circuits purchased by Australian providers from foreign providers and the number purchased by foreign providers from Australian providers. Any loss on outward traffic through excess prices paid to foreign providers could be offset by gain arising from prices received for inwards traffic. In this respect, this is similar to the accounting rate system.

Such an offset, however, is not available to users without ownership rights. In this case, any excess price would apply to the full volume of traffic (or line capacity). Some of the excess price could flow to domestic providers owning capacity (in economic terms this is partly a transfer and partly a welfare loss), and some to foreigners.

Until July 1997, all traffic in and out of Australia was carried by Telstra or Cable & Wireless Optus. This may have limited the use of leased lines and held up prices.

The Commission has no direct evidence of the extent of any excess prices in cable utilisation. However, from the table in box 4.4 in chapter 4, it appears that the current per minute equivalent excess price may be of the order of 7 US cents, say 10.5 Australian cents.

Interconnection

As noted in chapter 4, the ACCC has been studying interconnection rates for both fixed and mobile services.

- In June 1999, the ACCC found that Telstra's proposed fixed network interconnection charge of an average of nearly 5 cents per minute was more than double the costs that an efficient operator would incur in providing these services. If this figure can also be taken as typical of existing agreements between providers in the Australian market, an excess interconnection price of some 2-3 cents per minute applies. (In economic terms, some of this would represent a transfer and some a welfare loss.) The ACCC suggested that there could be a saving of some $400 million per annum at the consumer level if interconnection prices are reduced — although this is due mainly to the importance of national long distance traffic.
- In a draft decision published in February 1999, the ACCC rejected Telstra's undertaking in regard to mobile interconnection on the basis of the proposed non-price terms and conditions.

Possible future benefits

As cable capacity increases, and as technological change enables greater compression of data, underlying costs should rapidly fall. Projections about cable capacity and costs (see chapters 2 and 4) suggest that, in the near future, call conveyance costs will become insignificant.

The central question is whether prices will fall to a similar extent. This is certainly possible, although a definite answer cannot be given, as there is growing investment in international cable systems by suppliers not associated with the telecommunications providers (see section 4.4).

For interconnection, the ACCC investigations should result in the better alignment of interconnection prices with costs.

5.4 Payments for Internet traffic

Internet traffic is carried over the same cable lines and satellite circuits as discussed above. There must also be interconnection between domestic networks and international circuits. Accordingly, payments for Internet traffic should benefit from the changes described above in relation to leased lines and interconnection.

In regard to the specific payment arrangements for Internet traffic, Australia currently pays the line and interconnection/port costs of all such traffic to and from the United States. As discussed in chapter 4, although there is no reason for Australia and the United States to pay *equal* shares of the line and interconnection costs for Internet traffic originating in or destined for the United States, in a competitive market the United States would pay at least *some* of the cost.

According to data provided by Telstra (see chapter 2), approximately 75 per cent of international Internet traffic to and from Australia is with the United States. Some of this merely transits the United States — but Telstra indicated that at least 60 per cent of total traffic has the United States as its *origin* or *destination*. The balance of Internet traffic with the United States is approximately 2:1 — ie 1Mb of Australian IP packets are sent to the United States for every 2Mb of packets sent to Australia from the United States.

Telstra estimated the revenue loss to Australian providers as a result of current pricing arrangements at about $45-72 million per annum (sub. 8, p. 4). This was derived as follows:

- the annual total cost for the Australian market of international Internet connections is some A$300 million;
- trans-Pacific bandwidth costs represent 75-80 per cent of total bandwidth costs for Australian operators; and
- the US should bear some 20-30 per cent of this cost.

Possible future benefits

Internet traffic is growing rapidly. Telstra considered that ‘a conservative growth estimate’ for traffic/bandwidth would be 100 per cent per annum (sub. 8, p. 5). This suggests that the excess cost borne by Australia under existing payment arrangements could also grow rapidly.

There are some caveats, however. Telstra indicated that:

allowance must be made for reduction in unit costs/prices of international bandwidth due to new higher capacity submarine cable systems and also competition between USA backbone providers. (Sub.8, p. 5)

As well, excess port costs could be reduced as Australian providers link directly into US Internet exchange points. In this regard, for example, Telstra has announced that, as part of the Asia-Pacific Internet Community grouping of Asian carriers, it is to extend its backbone Internet network into the Palo Alto Internet Exchange (PAIX) in the United States (see box 2.3).

5.5 Conclusion

The estimates presented in this chapter suggest that at the provider level:

- most of the revenue loss to Australia (estimated at some $108 million for 1995-96) arising from high accounting rates may have already been eliminated;
- an excess price of 2-3 cents per minute may apply in Australia to interconnection with Telstra's domestic network;
- on a per minute equivalent basis, an excess price of about 10 cents may apply on leased lines for international traffic; and
- in regard to the Internet, Australian providers bear a total excess cost of about $45-72 million per annum.

Although these preliminary estimates, and thus the possible future benefits at the provider level from further change, may appear small in absolute terms:

- they are important relative to the size of the international telecommunications sector;
- the potential gains will increase as underlying costs continue to fall;
- the estimates do not capture inefficiencies arising from behaviour such as refile and callback; and
- they are based on current traffic volumes. As traffic volumes are increasing rapidly — Internet traffic is doubling each year, for example — total excess costs and potential gains could also increase rapidly.

Further, these estimates are likely to understate the benefits at the final consumer level which could be obtained through reforms leading to greater efficiency in pricing practices.

6 Issues and options

This chapter sets out objectives for reform and issues and options relating to future international telecommunications market regulation. The discussion is followed by consideration of passing on the benefits from reform to final consumers and of the international negotiation process.

The Commission has concluded that the broad strategies adopted by Australia in pursuing international telecommunications reform are appropriate. Further, it is clear that the greatest benefits for Australia have resulted from the liberalisation of its own domestic market and the markets of such countries as the United States, the United Kingdom and New Zealand.

Rather than making recommendations, the Commission has developed a series of findings — included at the end of the Overview — which respond to the terms of reference.

6.1 Objectives for reform

Continuing reform of telecommunications markets, domestic and international, has the potential to:

- increase the efficiency of production and use of international telecommunications in Australia;
- reduce excess prices paid by Australian users of telecommunications to domestic and foreign providers; and thus
- benefit the Australian community as a whole.

As explained in chapter 4, these objectives are more likely to be attained in a market environment where prices reflect the underlying costs of providing telecommunications services. Such an environment would:

- facilitate competition by allowing market access;
- treat Australian and foreign providers equally;
- allow providers freedom to negotiate with each other;
- provide the price signals to encourage efficient new investment;

- be largely self regulatory;
- guard against abuse of market power by individual firms, whether Australian or foreign; and
- facilitate technological change.

In general, participants supported these objectives. Box 6.1 summarises some participants' views on appropriate market settings.

Governments can promote these objectives by:

- ensuring domestic regulation is appropriate, transparent and light handed; and
- discussing and negotiating internationally to:
  - encourage the development of similar liberalised markets in other countries; and
  - achieve reform of relevant international institutional arrangements.

6.2 Accounting rate system

As set out in chapter 5, the revenue loss to Australia arising from the inefficiencies of the existing accounting rate system may now be less than in the past. Nevertheless, problems remain in particular with international telecommunications traffic to and from countries with non-liberalised markets which continue to use the accounting rate system. Further, although there has been progress towards market liberalisation through the WTO Agreement on Basic Telecommunications, reform of the accounting rate system itself has been slow.

A series of amendments to the ITU Recommendations on settlement have been going through the ITU ratification process for some considerable time. Agreement was reached in June 1999 to changes which give countries a choice of:

- the existing bilateral accounting rate system;
- one way cost-oriented termination charges; and
- any form of bilateral settlement on which they agree.

However, despite the additional options, many countries are likely to continue to favour the traditional accounting rate system mainly because they receive substantial foreign earnings from that system (see chapter 3). This is evidenced by the comment of DOCITA:

> While these amendments may appear elementary, negotiation through a multilateral process in which protectionist carriers were over-represented took approximately three

years, and was concluded only under the threat of unilateral price setting by the United States Federal Communications Commission. (Sub.6, p. 21)

Box 6.1 **Views on reform objectives**

Australian Information Industry Association (sub. 2, p. 2)

Required features of a telecommunications sector reform program:

- legislative backing;
- all entrants treated equally;
- adequately supported by Government with an independent regulator;
- local industry is an active participant in the infrastructure and the implementation of self regulation;
- points of authority and responsibility of the various stakeholders are clearly defined;
- includes a comprehensive access regime and effective tools to address anti-competitive conduct; and
- conforms with existing international requirements.

Telstra (sub. 4, p. 16)

The following regulatory conditions should assist Telstra and other international carriers to be more competitive:

- individual country arrangements which allow competition in the provision of international voice telephony services;
- individual country arrangements which give freedom and flexibility to international carriers to commercially negotiate and agree new and innovative international settlement arrangements;
- individual country arrangements which require the offering of cost-based domestic interconnection arrangements that could be used to terminate incoming international traffic;
- recommendations and rules covering the setting of accounting or settlement rates which will drive them closer to cost; and
- the use of broader regulatory provisions by overseas governments to protect against anti-competitive conduct.

Rail Access Corporation (sub. D14, p. 2)

[The Corporation] supports the Australian Government in taking steps to ensure that competitive safeguards are established [at the international level] which first, prevent the misuse of market power and second, allow domestic and international market growth based on equitable pricing arrangements.

As DOCITA commented, the ITU accounting rate system will 'become less and less prevalent as the number of liberalised markets grows' (sub6, p. 21). This suggests that the remaining distortions and inefficiencies arising from that system might best be reduced through encouraging an increase in the number of countries which pursue liberalisation of their own domestic markets.

The slow pace of institutional change through the ITU, however, raises the issue of what action Australia can take in the meantime to moderate the remaining deficiencies of the current accounting rate system.

Pursuing international negotiations and discussions for accounting rate reform

Reform may be more achievable through the auspices of the WTO than the ITU (see section 6.7). In this regard, Australia should endeavour to ensure that the commitment of WTO members to return to the accounting rate issue in the next round of negotiations is met. Thus, in the lead up to those negotiations, the Australian Government should continue discussions with other countries, bilaterally and in regional forums such as APEC, with the aim of resolving deficiencies in the accounting rate system through actions such as:

- lowering accounting rates;
- removing restrictions on differential settlement rates;
- removing parallel accounting requirements;
- removing proportionate return requirements; and
- allowing greater freedom for telecommunications providers to negotiate on commercial terms and conditions.

In its initial submission, Telstra suggested the Australian Government seek to negotiate removal of the US's 'continued requirements for parallel accounting and proportionate return' (sub. 4, p. 18). However, Telstra subsequently advised that:

> Given that Australia-US is an approved International Simple Resale (ISR) route and Telstra operates ISR agreements with USA carriers, we are not subject to the proportionate return and parallel requirements of the International Settlements Policy (ISP) [of the FCC]. (Sub. D18, p. 4)

Legitimisation of alternative calling procedures

Irrespective of the pace of reform under the auspices of the ITU or the WTO, the accounting rate system will continue to be undermined by alternative calling

procedures. These include international simple resale (ISR), callback and refile. ISR and callback are permitted in traffic between some markets, but not all. Although refile is not permitted under the ITU, it is a common practice in international telecommunications markets.

DOCITA indicated that the Australian legislative framework permits the provision and use of these procedures on the basis that they are 'legitimate commercial activities that are to be expected and even encouraged in a competitive telecommunications environment' (sub.6, p. 28):

> Our position remains that while it may be illegal for a consumer to access alternative calling services in some countries, it is not illegal for Australia to offer such services as those services are not illegal in Australia. (Sub*6*, p, 29)

The costs stemming from the accounting rate system could reduce more quickly if the use of alternative calling procedures were to become even more prevalent. Thus, an option for Australia would be to seek to increase, through discussion and negotiation, the number of countries which permit alternative calling procedures.

Removing traffic from the scope of the system

Countries which support continuation of the existing accounting rate system may be amenable nevertheless to the removal of particular categories of international telecommunications traffic from its scope. For example, significant volumes of international traffic originate and/or terminate on mobile networks — yet, as noted in chapter 3, the accounting rate system makes no allowance for the higher prices providers pay for mobile interconnection. This can lead to losses by international providers from such traffic, as well as to arbitrage behaviour such as mobile refile. Countries which support the accounting rate system in general may lose from its coverage of treatment of mobile traffic.

An option for Australia in promoting reform would be to seek the complete separation from the accounting rate system of international traffic originating or terminating on mobile networks, leaving payments for that traffic entirely to commercial negotiation. Such action, in regard to mobile and other relevant categories of traffic, could further 'chip away at the edges' of the accounting rate system, thus hastening fundamental reform.

Reducing scope for anti-competitive conduct

Some monopoly telecommunications providers in non-liberalised markets may continue to support the accounting rate system because it provides them with

opportunities to take advantage of providers in liberalised markets such as Australia's.

However, no conclusive evidence of anti-competitive behaviour by foreign providers in the Australian market was presented during the inquiry. Although there has been one complaint under the Rules of Conduct stemming from the Australian Telecommunications Act 1997 — these rules are intended to guard against anti-competitive conduct by international telecommunications providers — no substantiation was presented by the complainant after a request for information from the ACCC.

Telstra and the Rail Access Corporation expressed concern about market power in a broader context. For instance, Telstra commented:

> Globalisation and commoditisation of carriage favours consolidation and scale and can lead to concentrations of market power in vertically and horizontally integrated corporations. (Sub. 4, p. 20)

However, DOCITA commented that 'the normal rules on access to facilities and on anti-competitive conduct will be supervised by the relevant regulators', and that:

> Appeal could also be made under the International Rules of Conduct if the activity of a global alliance or other relationship were suspected of amounting to 'unacceptable conduct' under those rules. (Sub.6, p. 32)

At this stage, the Commission has concluded that there would be no benefit in making the Rules of Conduct more explicit. The ACCC noted that the rules 'already provide scope for the application of parallel accounting and proportionate return requirements if necessary' (sub.D20, p. 5). The Commission notes that a review of Part XIB of the Trade Practices Act, concerning telecommunications anti-competitive conduct and record keeping rules, is scheduled to be conducted by 1 July 2000. This review could provide a good opportunity for also examining the effectiveness of the Rules of Conduct under the Telecommunications Act.

Conclusion

Encouraging more countries to pursue liberalisation of their own domestic markets is considered the best approach to overcoming the distortions and inefficiencies which the accounting rate system imposes.

Australia could also increase pressure for the institutional reform of the accounting rate system itself by:

- seeking to ensure that the commitment of WTO members to include negotiations on the accounting rate system in the WTO round commencing before 2000 is met;
- seeking to increase the number of countries which permit alternative calling procedures;
- seeking complete removal of particular categories of international traffic, such as that originating or terminating on mobile networks, from the system; and
- from time to time reviewing the effectiveness of the Australian Rules of Conduct for international telecommunications operators in minimising opportunities for anti-competitive conduct.

6.3 Interconnection

As the institutional arrangements for the accounting rate *system* have begun to change, greater attention needs to be placed on the *individual elements* which go to make up international telecommunications services: in particular, on the prices of interconnection with domestic networks and on access to, and the pricing of, cable and satellite facilities. These elements already feature in payments for much non-accounting rate traffic.

Domestic interconnection charges at both the originating and terminating ends affect the total price of international telecommunications. In regard to foreign interconnection charges, Telstra considered that 'as many countries as possible ... [should] regulate for the provision of cost-based domestic interconnection rates' (sub. 4, p. 17). The Commission endorses such an approach, both for foreign countries and Australia.

In regard to its own interconnection rates, Telstra considered that 'the charges it has proposed are strictly in line with costs' (subD17, p. 2).

In contrast, Cable & Wireless Optus contended that (sub5, p. 25):

- Telstra sells to independent competitors at four times the price it sells to its retail arm;
- interconnection charges remain at least four times above cost; and
- domestic regulation is yet to deliver unbundled interconnection charges.

Telstra replied that:

> Optus provides a seriously misleading characterisation of the domestic telecommunications market and a flawed analysis of the impact of domestic interconnect arrangements on international telecommunications services. (SubD17, p. 10)

The ACCC has found that the interconnection rates offered by Telstra for PSTN access significantly exceed the costs of an efficient operator.

AAPT and Global One also commented on the importance of pricing for interconnection and transmission charges. For instance, Global One considered that:

> consumer benefits cannot be fully realised and indeed existing benefits remain at risk as long as Telstra continues to overcharge for domestic interconnection and for other domestic bottlenecks and delays and/or games bottleneck service provision. (Sub13, p. 3)

In its Position Paper, the Commission stated that, given the expected rapid fall in transmission costs and prices, interconnection is assuming more importance in the total cost equation. In this environment, the economic costs from any inefficient interconnection pricing would also become increasingly high.

AAPT supported the Commission's contention (subD15, p. 1). Telstra, however, contended that 'the level of domestic PSTN access charges can have virtually no impact on IDD rates'. It stated that, based on information presented by Cable & Wireless Optus, a reduction in the interconnection charge from 4.7 cents per minute to 1 cent per minute would at most reduce international call prices by 3 to 5 per cent (sub. D17, p. 2). In this regard, the Commission notes that:

- The Optus data used by Telstra relate to 1998 but, since then, prices have declined significantly. Telstra itself indicated that its traffic-weighted price per IDD minute decreased by 72 per cent in the year to May 1999. Thus, the relative importance of any given interconnection rate could have more than tripled in the last year. Similarly, the relative importance of a reduction in those rates would also have increased markedly to about 10 to 18 per cent.

- The importance of interconnection charges in comparison to the underlying *cost* of international telecommunications is much higher that in comparison to the *retail price*, as estimated by Telstra.

The Commission reaffirms the growing importance of interconnection charges and the importance of cost-based interconnection pricing. The Commission also considers that:

- an excessively high interconnection price may deter entry of new carriage service providers of international telecommunications services, or even encourage wasteful duplication of domestic network facilities;
- given the relatively price sensitivity of demand for international telecommunications services, there should be relatively little recovery of unallocable overheads from interconnection charges for international PSTN

traffic — in practice, it is likely to be more efficient to recover most of these costs elsewhere; and

- with data and other traffic where volume (bandwidth use) is more significant, including the Internet, it could be more efficient to base the charges for interconnection between international and domestic networks on other than a per minute basis, for example according to capacity utilisation.

Although the above discussion concentrates on the interconnection of international traffic with domestic fixed line networks, it is also important for the interconnection rates for origination or termination of international traffic on mobile networks to be set efficiently. AAPT considered that the 'current interconnection charges of all three mobile carriers in Australia are significantly above cost' (subD15, p. 2).

6.4 Transmission facilities

There is some evidence to suggest that access to transmission facilities has been difficult and expensive for some Australian providers, relative to the access available to Telstra and Cable & Wireless Optus (see section 4.4). The reasons for this include capacity constraints, especially in a time of growing demand for traffic including Internet traffic, as well as the exercise of ownership rights in setting prices.

Despite past deficiencies, there is evidence that market developments themselves will achieve a better outcome over time. Earlier chapters report the growing investment in cable, including to Australia, with significant investment by non-carriers. Access to new cables is likely to be available not just to well-established carriers, but also to new competitors and service providers. With continuing technological change, the underlying costs of cable usage are falling rapidly.

In the meantime, providers with concerns about access to transmission facilities for international telecommunications — for example, the half circuits 'owned' by Australian carriers such as Telstra and Cable & Wireless Optus — could raise these with the ACCC either by:

- seeking to make an 'unacceptable conduct' case under the Rules of Conduct for international telecommunications operators; and/or
- seeking to have the relevant facilities 'declared' by the ACCC (see box 1.1).

In its submission (sub.10, p. 11), the ACCC stated that it had not considered whether to declare infrastructure facilities or cable directly relating to international telecommunications services. Such a declaration could only follow an ACCC public

inquiry process, or the recommendation of the Telecommunications Access Forum (sub. 10, p. 10). In considering possible declaration, the ACCC would need to balance a range of factors, including the likelihood of a market-based solution to any access problems developing in the relatively short term as noted above.

PanAmSat, the world's largest privately owned satellite operator, raised two issues of concern in relation to its Australian operations. It stated that:

- the international revenue of international satellite carriers is included in the arrangements for the calculation of the Universal Service Obligation (USO) contribution, whereas the revenue of international submarine cable consortia is not included; and
- preferential regulatory treatment is accorded to the international satellite consortia, INTELSAT and Inmarsat. (Sub. 9, p. 1)

Each of these practices, if substantiated, would appear to be inequitable or inefficient.

In regard to the first, a USO liability arises for PanAmSat because it holds an Australian carrier licence. However, PanAmSat needs to be licensed not because it provides *international* services, but because it provides *domestic* carriage services. In contrast, the international cable consortia do not provide *domestic* carriage services, and thus do not need to be licensed as carriers and contribute to the USO for providing essentially the same services as PanAmSat. This situation appears anomalous. DOCITA has been reviewing the USO regime and considering issues like the one raised by PanAmSat.

In regard to the second point, the Commission considers that, in principle, regulatory arrangements should not discriminate against particular providers solely on the basis of whether their ownership is public or private. Also, this is contrary to the competitive neutrality principle under National Competition Policy.

In summary, enhanced access to, and lower pricing of, transmission facilities is likely to be achieved through market developments. However, the Rules of Conduct of the Telecommunications Act and/or the access provisions of the Trade Practices Act provide possible remedies for providers in the shorter term.

6.5 Pricing of Internet traffic

US ISPs are currently taking advantage of their market power to ensure that Australian providers pay the full cost (both ways) of Internet international transmission capacity to and from the United States. As well, Australians also pay

port charges to access the Internet in the United States, while US providers obtain access to the Internet in Australia without paying port charges here.

Such use of market power disadvantages Australian providers (and ultimately consumers) relative to a situation of greater competition. This is not to say that, with greater competition, Australia and the United States would pay *equal* shares. As Telstra indicated:

> it is probably appropriate to acknowledge that for Australia, use of and hence benefit from Internet connection to the US is higher than that from the US to Australia ... (Sub. 4, pp. 14–15)

However, in a competitive market, the United States would pay at least *some* of the cost.

The question of Internet pricing is under study and discussion in many different forums, including the OECD, APEC, WTO and the ITU. For example, APEC is undertaking studies into 'International Charging Arrangements for Internet Services' and the provision of Internet bandwidth and access in the Asia-Pacific. Also, Australia has proposed that the issue be included in the forthcoming round of WTO negotiations.

In aiming at a more competitive international Internet market, an issue is whether market forces will themselves solve the 'problem' or whether government intervention is needed. Although the Internet has been dominated by the United States until now:

- it is relatively new and non-US originated content is likely to grow in relative importance over time;
- even in the US market, pricing for Internet services is moving away from peering towards cost-based provision; and
- non-US carriers are taking steps to increase their own market power. For example, as noted in box 2.3, Telstra is extending its Internet capacity to the United States and, together with a group of regional carriers, is establishing an Internet router at the Palo Alto Internet exchange.

Changes such as these should put market pressure on US providers to contribute to more of the international Internet costs. Indeed, US interests have argued that the market will provide a solution. In a background paper to the APEC telecommunications working group, the United States stated:

> Where concerns over commercial arrangements to provide Internet services may exist, regulators should let the private sector develop commercial responses. During this time of rapid telecommunications liberalisation and technology innovation, the United States believes that cost efficient arrangements for Internet traffic will continue to be worked

> out most quickly if the market is not hampered by government regulation. Unnecessary regulation could stifle the global development and expansion of Internet infrastructure and services. (APEC 1999b, p.1)

Australia has not been content to wait for market forces, and has been encouraging international discussions on the issue. DOCITA stated that:

> Australia's objective ... will not favour direct interventionist regulation, but will encourage application of appropriate market disciplines to balance the substantial market power of the most developed economies. (Sub6, p. 23)

Australia has proposed an Internet charging model which 'should serve the needs of all stakeholders based upon equitable distribution of costs and benefits, including return on investment' (APEC 1999c, p.1).

In the Commission's view, it is appropriate that the Australian Government pursue international action to speed up implementation of appropriate market-based Internet payment arrangements. Even though such arrangements might ultimately develop without government discussion and negotiation, delay could cause the current excess cost to Australia — estimated by Telstra at some $40-70 million per annum — to grow rapidly in line with growth in household and business use of the Internet.

The Commission therefore endorses the approach of the Australian Government in seeking international discussions on reforming Internet payment arrangements, to give added momentum to market forces. The pro-competitive principles contained in the WTO Reference Paper relating to basic telecommunications services could serve as a useful input into those discussions.

6.6 Passing on the benefits from reform

The evidence available to the Commission during this inquiry argues strongly that the liberalisation of telecommunications markets, domestically and internationally, has brought significant benefits for users, particularly in respect of voice calls at the retail level.

One area where some doubt was expressed relates to the extent to which these benefits have been passed on to businesses which require bandwidth and data services. The Australian Telecommunications Users Group advised that:

> one additional issue of significance is the failure of most carriers to lower the price of dedicated links or data services in line with underlying cost reductions and with the declining cost of international call charges. (Sub3, p. 3)

Further, telecommunications tariff structures are often not particularly transparent, frequently bundling services together in different combinations, making it difficult for business users to shop around for the best deal.

In response, Telstra disagreed with ATUG's claim as:

> the price of dedicated links or data services has been lower [about half] than international call charges … Competition by its nature has resulted in a reduction in prices of international calls and international private leases [for dedicated links and data services] … (Sub. D19, p. 2)

The Commission notes that the ACCC monitors and *publicly* reports annually on charges paid by consumers. It has published its first such report, concentrating on Telstra's charges, and intends to increase the scope of future price reporting to progressively cover a range of additional carriers and services (ACCC 1998d).

In the Position Paper, the Commission commented that, while a competitive market is still developing, there is a role for the ACCC to publish publicly relevant information. Telstra expressed 'puzzlement and disappointment' at this comment, claiming that the large reductions in international call prices over the last five years 'was not brought about by increased regulation — rather, it was the result of reducing the extent of regulatory restraint' (sub. D17, p. 7). Telstra noted that an Industry Commission 1997 staff information paper had concluded that:

> given the increasing incentive for tacit collusion as switched service providers' market share increases, it may not be desirable for the ACCC to publish tariffs supplied to it upon request. Standard competition policy safeguards alone may be a more effective means of preventing anti-competitive pricing. (IC 1997a, p. 42)

However, since that staff paper was finalised, over 25 new carriers have entered the Australian market, together with many more carriage service providers. In the Commission's view, any danger of tacit collusion would be now minimal and would be further reduced as the scope of ACCC monitoring and reporting expands. Further, the main rationale for *public* price reporting is to inform prospective purchasers of the range of service options and prices available in a market of rapid change, but still limited transparency.

In the Commission's view, providers could be encouraged to pass on more of the benefits of reform to other service providers and to business users if the ACCC were to extend its public reporting further than proposed — for example, it could include the *prices* paid by users for dedicated lines and data services. The ACCC commented that it would consider the extent to which leased lines and data services meet its criteria for extending its price monitoring: relative importance, extent of substitutes and degree of policy concern (sub. D20, p. 3). Still greater pressure would be put on providers to pass on reform benefits if more information about the

underlying *costs* of provision of international telecommunications were also made readily available publicly.

The Commission is aware that reporting requirements impose compliance costs on the telecommunications industry. However, a recent draft report from the ACCC — *Record Keeping Rules for the Telecommunications Industry*, issued for comment in June 1999 (ACCC 1999c) — proposes that carriers be required to report to the ACCC on a range of revenue, cost and capital information. The ACCC indicated that the draft rules encompass wholesale international long distance and wholesale international leased lines (sub.D20, p. 3). The purpose of such reporting is to strengthen the ACCC's ability to investigate anti-competitive behaviour and determine appropriate access prices. Such reporting could form a base from which to draw appropriate information to publish*publicly* without imposing still further additional compliance costs on telecommunications providers.

6.7 Negotiating internationally

The Commission supports an international negotiating stance which builds on Australia's own record to embrace bilateral and regional support for further market liberalisation. With this support, Australia can hope to exert greater influence in multilateral forums. To this extent, the Commission endorses the comments of DOCITA that:

> The principal strategy for change is to exert influence in the multilateral processes that set the global regulatory environment, by building on regional and bilateral alliances with governments that share common objectives with Australia. (Sub6, p. 20)

DOCITA has summarised Australia's objectives in these negotiations (sub6, pp. 20, 37):

- The next round of WTO GATS negotiations should result in recognition of telecommunications termination services as traded services that are subject to the standard GATS disciplines of transparency and non-discrimination, including National Treatment and MFN.
- The ITU should modify its basic instruments so that the International Telecommunications Regulations appropriately reflect the role of governments in promoting open and competitive markets for international telecommunications services.
- Equivalent market-based principles as are applied to conventional telecommunications should be applied to the telecommunications elements of Internet services, with emphasis on light-touch, industry self-regulation and a minimum of new or specific regulation.

- The principle of technology neutrality should be observed wherever possible in the framing of regulation, so that regulation can be robust in the face of continuing development of telecommunications and information technology.
- The Australian Government should reserve sufficient powers to intervene where necessary to protect competition in the Australian market or other matters of significant national interest.

DFAT also noted:

> DFAT and Austrade will ... continue to make efforts in bilateral, regional and multilateral forums as appropriate to enhance Australian industry's capacity to develop further telecommunications goods and services exports. (Sub11, p. 8)

Telstra emphasised the need for multilateral initiatives to bring prices closer to costs in all countries, not just those which have already liberalised:

> the Australian Government [should] support multilateral regulatory initiatives intended to force accounting rates closer to costs, but only provided that such initiatives could be guaranteed to force rates closer to genuine costs across *all* types of countries. It is important to make clear that it would be inappropriate to support initiatives which would force settlement rates paid to already liberalised countries, such as Australia, even closer to genuine costs thus perpetuating the present inequities. (Sub4, p. 17)

In the light of the benefits arising from Australia's own market liberalisation, the Commission considers that the most urgent reform priority is to pursue further market liberalisation across all countries with remaining barriers to effective competition. This objective is clearly best pursued through the WTO — further negotiations are scheduled to commence by 2000. In terms of payment arrangements in particular, a reform program was not included in the WTO Agreement on Basic Telecommunications. WTO members have agreed to return to the accounting rate issue in these further negotiations.

Australia is also continuing to pursue change through the ITU, even though, according to DOCITA, the 'processes for achieving change are treaty-based, cumbersome, and take several years to accomplish even where there is a strong consensus for change' (sub.6, p. 20).

DOCITA (sub. 6, p. 39) noted a number of specific concerns that Australia has with the ITU (also see appendix A.) For example, a number of the Articles of the ITRs, if fully observed, restrict the development of competition, support monopolies and require inappropriate levels of government intervention. Further, application of certain Articles could cause countries which have liberalised their markets to act in breach of their domestic telecommunications and competition policies and WTO treaty obligations.

In noting that if the ITU rejects change at the next scheduled opportunity (2002 at the earliest for the next world conference of ITU members), 'advanced telecommunications economies ... will probably cease to recognise the authority of the ITU', DOCITA commented that 'this would be a regrettable outcome for Australia, because Australia relies on authoritative multilateral fora such as the ITU to moderate the market power of our largest trading partners' (sub6, p. 20). However, DOCITA also noted that 'in reality, the WTO GATS commitments provide an acceptable alternative for liberalised and liberalising economies that are WTO members' (sub. 6, p. 21).

Bilateral and plurilateral discussions would also prove useful in clarifying issues and in agenda setting for the forthcoming WTO negotiations. In APEC, Australia could continue to argue the case for market liberalisation and the freeing up of payment arrangements, including for the Internet. APEC is already undertaking significant work in this regard. As DFAT commented:

> The APEC Telecommunications Working Group, established in 1990, has made significant progress in establishing a framework for liberalised trade in telecommunications in the Asia-Pacific region. (Sub11, p. 5)

DFAT also noted the value of bilateral agreements, particularly in regard to the development of information technology industries and electronic commerce:

> These [bilateral collaborative] agreements [with Singapore and Hong Kong], which have a strong focus on trade and investment, establish formal communication channels with major players in the emerging information economy and will enable us to maintain dialogues on international telecommunications and information technology issues. (Sub. 11, p. 4)

Realistically, Australia does not have the market power to endeavour to force change unilaterally. It must rely on building up spheres of influence. In this regard, Telstra considered that Australia's negotiating position with those many countries critical of the US FCC's current unilateral approach would be enhanced if it indicated disapproval:

> the Australian Government's interactions and negotiations with these other countries would likely be enhanced if it were to clearly indicate its disagreement with the FCC's continuing restrictive approach ... (Sub.4, p. 18)

The Commission notes that 'while sympathetic to the FCC's objectives, DOCITA has expressed concern that this action [ie the FCC's unilateral price benchmarks] may damage the multilateral arrangements ...' (sub.6, p. 24).

In conclusion, the Commission supports the thrust of Australia's international negotiating positions in regard to telecommunications. Achieving further liberalisation of domestic markets is the most urgent reform need — this objective is

best mainly pursued through the WTO. It is also important for WTO members to recommence negotiations on issues relating to the accounting rate system. There is merit in continuing to pursue accounting rate reform through the ITU.

A International regulatory change

Over the past decade, international telecommunications markets have been subject to extensive regulatory change at both the multilateral and unilateral levels. This appendix describes three processes of particular significance:

- market liberalisation reforms pursued *multilaterally* by the World Trade Organization (WTO);
- changes to the accounting rate system pursued *multilaterally* by the International Telecommunications Union (ITU); and
- the attempts by the US Federal Communications Commission (FCC) to force change to the accounting rate system *unilaterally*.

A.1 World Trade Organization

A major achievement of the Uruguay Round of multilateral trade negotiations was the General Agreement on Trade in Services (GATS). It is the first multilateral agreement to subject services to rules aimed at liberalising trade with enforcement through an agreed dispute settlement mechanism.

Obligations under the GATS relate to, among others, most favoured nation treatment (which prohibits Members from discriminating between themselves), market access (which prohibits restrictions such as on the number of service providers or on participation of foreign capital), transparency and national treatment (which prohibits Members from discriminating in favour of national providers). Additional obligations in relation to access to and use of 'public telecommunications transport networks and services' are contained in the GATS Annex on Telecommunications.

Although the GATS represents a significant step forward, a major structural weakness is that market access and national treatment obligations only apply to those services identified by Members in their schedules of 'specific commitments'. Most Members preferred either to make unbound (or no) commitments or to bind the current situation, including existing regulatory impediments. Most also chose not to list many important services.

In relation to telecommunications services, many Members' schedules of specific commitments included 'enhanced telecommunications services' such as electronic mail, voice mail, on-line information, electronic data interchange and value added facsimile services, but did not include 'basic telecommunications services' such as voice telephone, telex, telegraph and private leased circuit services.

In negotiating the GATS, a decision was taken to extend negotiations on basic telecommunications services on a voluntary basis. These negotiations concluded three years later in February 1997 with what is commonly referred to as the Agreement on Basic Telecommunications (ABT). The ABT, which came into force on 5 February 1998, consists essentially of the scheduled commitments of participating Members in regard to basic telecommunications services[1]. These commitments cover market access (including foreign direct investment), national treatment and pro-competitive regulation (such as competition safeguards, interconnection guarantees, transparent licensing processes and the independence of regulators).

As of November 1998, 75 countries (more than half the total WTO membership, the EU counting as one) had submitted scheduled commitments on basic telecommunications services (WTO 1998a, p. 6)[2]. They include developed countries such as in the European Union, Japan, the United States, Canada, Australia, Hong Kong and Singapore and developing countries such as Korea, Brazil, Argentina, India and Turkey. For many Members, such as Australia, the United Kingdom and the United States, the ABT locked in pre-existing unilateral reforms. However, for others, the ABT implied substantial additional market liberalisation. Table A.1 summarises the scheduled commitments (and exemptions to most favoured nation treatment) of WTO Members representing Australia's major telecommunications destinations.

An important outcome of the negotiations on basic telecommunications was the development of a set of pro-competitive regulatory principles, known as the Reference Paper. It is legally binding for the 57 Members (including Australia) which have agreed to accept it. It covers regulatory issues which have an important bearing on competitive conditions including interconnection, spectrum allocation and competitive safeguards.

1 The schedules are annexed to the Fourth Protocol to the GATS.

2 By the February 1997 deadline for the negotiations, 69 countries (the European Union counting as one) submitted scheduled commitments. These countries represented 93 per cent of world telecommunications trade.

Table A.1 **The scheduled commitments of WTO Members representing Australia's major telecommunications destinations**

WTO Member	*Share of Australia's outgoing telecom. traffic in 1997*	*Key aspects of scheduled commitments*
	per cent	
European Community incl. United Kingdom	15 (UK)	Commits to complete liberalisation of basic telecommunications services across the EC for all market segments. Also covers, for example, satellite networks and services and all mobile and personal communications services and systems. Commits to the Reference Paper on regulatory principles.
New Zealand	12	Commits to open markets for all basic telecommunication services for all market segments. Under a national treatment limitation, no single foreign entity is permitted to hold more than 49.9 per cent of Telecom New Zealand; this does not limit the overall foreign shareholding in that operator. Commits to the Reference Paper on regulatory principles.
United States	11	Commits to open markets for essentially all basic telecommunication services for all market segments including unrestricted access to common carrier radio licences for operators that are indirectly foreign owned. Also covers, for example, satellite based services, cellular telephony and other mobile services. Removal of restrictions on the landing of submarine cable. Limitations on market access include no issuance of radio licences to operators with more than 20 per cent direct foreign ownership and Comsat retains exclusive rights to links with Intelsat and Inmarsat satellite capacity. Commits to the Reference Paper on regulatory principles. Submits a most favoured nation treatment exemption list on telecommunications services involving one way satellite transmission of DTH and DBS television services and digital audio services.
Singapore	4	Commits to phase in of competition in facilities-based telecommunication services in April 2000 when up to two additional operators will be licensed; additional licences will be granted thereafter. Offers open markets for mobile data, cellular telephony and trunked radio services and for paging services after April 2000. Commits to the provision of domestic and international resale of public switched capacity (not including the connection of leased lines to public networks) for most basic services, including voice, data and ISDN. Foreign equity limited to 49 per cent for facilities based supply. Indirect investment of up to a total of 74 per cent allowed. Commits to the Reference Paper on regulatory principles.
Hong Kong	4	Commits to international simple resale for facsimile and data transmission services. Already provides access to the local market for many basic telecommunications services including voice and data transmission as well as mobile radio telephone and mobile data services. For local fixed network services, four licences already issued and the issuance of further licences will be given consideration in June 1998. Hong Kong Telecom's monopoly on international services to expire in 2006. Commits to permit callback and other alternative international calling services, certain satellite services, virtual private networks and mobile satellite services. Commits to the Reference Paper on regulatory principles.

Table A.1 **(continued)**

WTO Member	*Share of Australia's outgoing telecom. traffic in 1997*	*Key aspects of scheduled commitments*
Japan	3	Allows participation in international simple resale of voice services.
		In April 1996, agreed to remove long standing foreign equity limits on Type I carriers and radio based services, leaving only two companies KDD and NTT with foreign equity limits at 20 per cent. Aside from these company specific restrictions, open market access is committed in all market segments for basic telecommunications services (facilities based and resale).
		Commits to the Reference Paper on regulatory principles.
Indonesia	3	Will delete an economic needs test for new entrants in domestic mobile cellular telephone services, personal mobile cellular communication services and regional and national paging services. Public voice telephony, circuit switched public data network and teleconferencing services currently supplied by a number of suppliers with exclusive rights. Commits to a policy review to determine whether to admit additional suppliers upon the expiry of the exclusive rights: exclusivity expires in 2011 for local service; in 2006 for long distance service; and in 2005 for international service. Offers competition for packet switched public data network services, telex, telegraph and Internet access services, subject to use of networks of Indosat and Satelindo for international traffic. Offers competition in domestic mobile cellular telephone services, paging, public payphone services.
		Foreign equity limited to 35 per cent for all services except personal communication services which require joint venture with state owned company.
		Commits to the Reference Paper on regulatory principles.
China	3	Not relevant.
Malaysia	3	Offers the opportunity to acquire foreign equity in existing facilities based public telecommunications operators. Services supplied by the existing operators include voice telephony (wire or wireless), data transmission, private leased circuit services, domestic and international satellite services and satellite links/capacity, satellite earth stations, terrestrial and satellite based mobile services and video transport services.
		Foreign shareholding of up to 30 per cent is permitted in these operators.
		Commits to most regulatory principles in the Reference Paper.
Canada	3	Offers a liberalised regime for resale-based competition in local telephone services and in most other basic telecommunications services. Telesat Canada's exclusive rights on satellite facilities and earth station serving US/Canada market will be eliminated after March 2000. Removed from 1 October 1998, restriction on obtaining licences to land submarine cables. Maintains a few limitations on market access for telephone service in certain cities or Provinces.
		Commits to phasing out certain routing restrictions and foreign equity limits on many services by the year 2000. Removes a requirement that Canadian equity holding in mobile satellite systems must equal Canadian usage levels. Limits foreign equity in all facilities-based suppliers to 20 per cent direct and 46.7 per cent combined direct and indirect foreign ownership. Teleglobe's monopoly on overseas (non US) facilities-based service will be eliminated and its foreign equity limits will be raised to 46.7 per cent after October 1998.
		Commits to the Reference Paper on regulatory principles.

Source: WTO (1998b); TeleGeography (1998, p. 159); DFAT (sub. 11, Annex A).

Although it is an impediment to market access, the accounting rate system was not covered by the ABT. During negotiations, participating Members raised concerns about the effect of most favoured nation treatment on differential settlement rates, developing country issues such as foreign exchange payments under the present system and whether settlement rates are the result of commercial negotiations or are regulatory measures (Ovum 1998, p. 110). The WTO has delayed further discussion on the accounting rate system until the next round of GATS negotiations expected to begin by 2000.

A.2 International Telecommunications Union

The ITU was originally formed in 1865 to administer the International Telegraph Convention, which was signed by 20 participating countries. The Convention included rules to standardise equipment for interconnection and international tariff and accounting rules. The ITU, which consists currently of 188 Member States and Sector Members, has no power to enforce its recommendations — these need to be adopted by national governments to have effect. In contrast, the International Telecommunications Regulations (ITRs) which, in the main, cover the general principles relating to settlement arrangements are binding on Member States.

The ITU has been seeking changes to the accounting rate system since the early 1990s. Work has been pursued through Study Group 3 of the ITU Telecommunication Standardisation Sector, which is responsible for tariff and accounting principles in international telecommunications. Study Group 3's work has focused on:

- driving accounting rate levels closer to costs; and
- new methods for remunerating providers for call termination.

Some ITU members, who have pursued liberalised market policies, consider that there are some problems with the ITRs in view of the changed structure and operation of global telecommunications. These regulations can only be amended at a world conference of ITU members which was last done in 1988. The ITU Plenipotentiary conference agreed that an expert group be set up at a meeting in June 1999 to examine these concerns and report to the Council by June 2000 (box A.1).

Box A.1 **International Telecommunications Union (ITU)**

The ITU comprises governments (Member States) and the private sector (Sector Members). Telecommunication standardisation study groups study particular issues referred to them and prepare draft recommendations. These must be submitted for approval to the World Telecommunication Standardisation Conference, or to administrations by correspondence.

International Telecommunications Regulations (ITRs), for the most part, concern international telecommunications settlements. The ITRs were last amended at the 1988 World Conference. These regulations can only be amended at a world conference of ITU members, currently known as the World International Telecommunication Conference.

The Plenipotentiary Conference of the ITU in November 1998, in recognition of some potential problems with the ITRs, agreed that an expert group be set up to:

- study the roles and responsibilities of Member States and Sector Members regarding the regulation and operation of international telecommunications services;
- consider the wider multilateral treaty obligations that may affect the regulation of international telecommunications; and
- review the extent to which the current needs of Member States are reflected in the basic instruments of the Union and in particular the ITRs.

An expert group of 20 members was set up at the ITU Council meeting in June 1999, with a report due by June 2000.

Source: DOCITA (sub. 6); ITU (http://www.itu/newsroom/press/releases/1999/NP-6.html).

Accounting rate levels

A key development was Recommendation D.140 (Accounting Rate Principles for International Telephone Services) which was agreed to by ITU Member States in 1992. This Recommendation provided for accounting rates to be cost-based, non-discriminatory and transparent within five years. However, it has been subject to two further revisions: in 1995, Annex C set out two possible approaches to negotiating accounting rates and, in 1998, Annex D established a ceiling on the total accounting rate of 1 SDR per minute (excluding transit charges) to be achieved by the end of 1998.

A focus group attached to Study Group 3 was established in 1998 to propose 'transitional arrangements towards cost-orientation beyond 1998, including ranges of indicative target rates'. In its final report, the focus group proposed a new Annex E to Recommendation D.140 setting out, among other things, target settlement rates

which varied according to teledensity (see table A.2) as well as transition periods (see table A.3). The target settlement rates were derived for each relevant teledensity from the average of the lowest 20 per cent of published settlement rates.

The revised text of the proposed new Annex was considered at the Study Group 3's June 1999 meeting, with a majority of administrations supporting the draft. It will be submitted for approval at the December 1999 meeting.

Table A.2 **ITU focus group's proposals on target settlement rates**

Teledensity range	*Countries falling within the relevant teledensity range*[a]	*Target settlement rate*	*Target settlement rate*
T = Telephone lines per 100 inhabitants		SDR per minute	US cents per minute
T> 50	Australia, Canada, Denmark, France, Germany, Hong Kong, Sweden, Switzerland, United Kingdom, United States	0.043	5.7
35 < T ≤ 50	Austria, Ireland, Italy, Japan, Korea, New Zealand, Singapore, Spain	0.088	11.8
20 < T ≤ 35	Bahamas, Czech Republic, Hungary, Uruguay	0.118	15.8
10 < T ≤ 20	Argentina, Chile, Iran, Malaysia, Russia, South Africa	0.162	21.6
5 < T ≤ 10	Bolivia, China, Egypt, Mexico, Peru, Thailand, Uzbekistan	0.210	28.0
1 < T ≤ 5	Albania, Cuba, India, Indonesia, Philippines, Vanuatu, Zimbabwe	0.251	33.5
T ≤ 1	Afghanistan, Angola, Cameroon, DPR Congo, Liberia, Nigeria	0.327	43.7.

[a] These are only a selection of countries falling within the relevant teledensity range.

Source: ITU (1998, pp. 5, 7-13); Hill (1998, p. 7).

Table A.3 **ITU focus group's proposals on transition periods for target settlement rates**

Net settlement payments (NSP) relative to total telecommunications revenue (TTR)	*Target year for achieving target settlement rate*
NSP < 10 per cent TTR	Year end 2001
10 per cent TTR < NSP < 20 per cent TTR	Year end 2002
20 per cent TTR < NSP < 30 per cent TTR	Year end 2003
NSP > 30 per cent TTR	Year end 2004

Source: ITU (1998, p. 4).

New remuneration methods

Study Group 3 has recently completed work on methods for remunerating providers. A draft revised Recommendation D.150 (New System for Accounting in International Telephony) containing three methods of remuneration, including termination charges, was submitted to ITU Member States in February 1999 for approval. Recommendation D.150 was approved and became operational from 15 June 1999.

Australia's concerns with the International Telecommunications Regulations of the ITU

DOCITA's concerns are that a number of Articles in the International Telecommunications Regulations, if fully observed, have the effect of restricting the development of competition, supporting monopolies and requiring inappropriate levels of government intervention in telecommunications markets. For example:

- Article 3.3 requires that a direct route must be used where it exists between two administrations, even if it is not the most efficient route or the route preferred by both administrations. However, this Article limits the ability of carriers or transit operators to compete for international telephony business by offering alternative (indirect) international routes at cheaper prices.
- Article 6.1.2 requires that 'the charge levied by an administration on customers for a particular communications should in principle be the same in a given relation, regardless of the route chosen by that Administration.' This Article provides no incentive for an Administration to choose, or agree to, the least expensive routes. DOCITA considers that this is anti-competitive and inconsistent with any contemporary practice of commercial traffic management.
- Appendix 1 generally results in there being no cost-related basis to the rates charged for the use of a particular route, or the differences in cost between different routes. It does not reflect the actual commercial practice of dynamic traffic management that is in everyday use. (Sub. 6, pp. 39–40)

A.3 Federal Communications Commission

Throughout the 1990s, the FCC has unilaterally implemented changes to the accounting rate system as it applies to US providers. These changes also have an effect on providers from other countries.

The United States has been largely motivated by concerns about the large *above cost* subsidy — estimated by the FCC to be at least $US3.7 billion — from US consumers to foreign providers. Hence, the changes focused on reducing settlement rates towards cost. However, many of them were intended to introduce greater competition in the US telecommunications market and reinforce anti-competitive safeguards. The changes are described below in chronological order.

In 1986, the FCC introduced its International Settlements Policy (ISP) to prevent foreign monopoly providers from 'whipsawing' US providers. The ISP required uniform and equally divided accounting rates, non-discriminatory treatment of US providers and proportionate return of traffic.

In 1991, the FCC allowed US providers to resell their international private lines to provide switched services to countries that afford equivalent resale opportunities (known as the FCC's private line resale policy).

In 1992, the FCC issued its first order on settlement rate benchmarks. US providers were required to reduce their settlement rates to between: SDR 0.275 and 0.42 for US-Asia relations; and SDR 0.165 and 0.275 for US-Europe relations. The order also streamlined some of the procedures imposed on these providers to reduce their accounting rates and introduced some flexibility in the ISP by allowing settlement rates to differ if justified by differences in costs.

In January 1996, the FCC announced its Accounting Rate Policy Statement which represented a significant change in its approach to settlement rates. It expanded beyond its private line resale policy to endorse new services in the international telecommunications market. It also pledged to tailor its settlement rate policies to reflect different market structures; that is, monopoly or highly concentrated markets, effectively competitive markets and developing countries' markets.

In December 1996, the FCC introduced its Flexibility Order to introduce greater flexibility in its ISP. The Order allowed US providers to negotiate payment arrangements which deviated from the uniform settlement rate and proportionate return requirements with foreign providers from countries open to competition.

In August 1997, the FCC issued an Order which revised its 1992 benchmark settlement rates to reflect cost reductions due to recent technological improvements and structural changes occurring in the international telecommunications market. The benchmarks are 15 US cents per minute for high income countries, 19 US cents per minute for middle income countries, and 23 US cents per minute for low income countries (see table A.4). The benchmarks are to be phased in over transition periods. If foreign providers were not willing to agree to these benchmark rates in

the specified time period, the FCC may direct US providers to withhold any payment above them.

Table A.4 **FCC's 1997 revised benchmark settlement rates and transition periods**

Income / teledensity range[a]	*Countries falling within the relevant income / teledensity range*[b]	*Benchmark settlement rates*	*Transition period*
		US cents per minute	
High income	Australia, Austria, Bahamas, Denmark, France, Germany, Hong Kong, Ireland, Italy, Japan, New Zealand, Singapore, Spain, Sweden, Switzerland, United Kingdom	15	1 January 1999
Upper middle income	Argentina, Czech Republic, Chile, Hungary, Korea, Malaysia, Mexico, South Africa, Uruguay	19	1 January 2000
Lower middle income	Angola, Bolivia, Cuba, Indonesia, Iran, Philippines, Peru, Thailand, Russia, Uzbekistan, Vanuatu	19	1 January 2001
Low income	Afghanistan, Albania, Cameroon, China, DPR Congo, Egypt, India, Liberia, Nigeria, Zimbabwe	23	1 January 2002
T = telephone lines per 100 inhabitants < 1	Afghanistan, Angola, Cameroon, DPR Congo, Liberia, Nigeria	relevant rate above applies	1 January 2003

a Income is defined as GNP per capita. **b** These are only a selection of countries falling within the relevant income/teledensity range.

Source: FCC (1997).

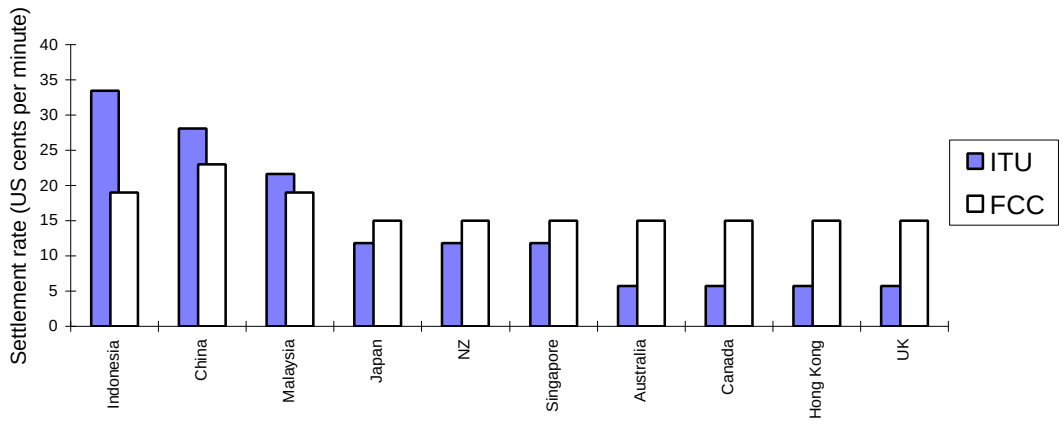
The 1997 Order also addressed competitive distortions in the US market such as one way bypass.

- To prevent one way bypass, the FCC may permit a provider to provide switched services over international private lines only if at least half of the traffic on the route is settled at rates that are at or below the relevant benchmark in table A.4. If it finds that one way bypass is occurring, the FCC can take enforcement action which may include a requirement that US providers be prohibited from using their authorisations to provide switched services over private lines on a given route until settlement rates for at least half the traffic on that route are at or below a 'best practices' rate, calculated at 8 US cents per minute.

- To prevent a US provider from using a foreign affiliate's above benchmark settlement rate revenues to gain an 'unfair' price advantage over other US providers, the FCC may require that the foreign affiliate charges a settlement rate that is at or below the applicable benchmark rate. This enforcement action may include a requirement that the settlement rates of the foreign affiliate be reduced to the 'best practices' rate as a condition of continued service on that route from the US market.

A comparison of the FCC and ITU's benchmark settlement rates is given in figure A.1. Some significant differences are apparent, although the full effect of this could only be assessed in the context of the balance of traffic flows to particular countries.

Figure A.1 **Comparison of ITU and FCC settlement rate benchmarks**
Selected countries



Data source: Tables A.2 and A.4.

In April 1999, the FCC issued an Order reforming its ISP.The Order was intended to bring the rules in the ISP in line with recent liberalisation in international telecommunications markets. Specifically, the FCC:

- eliminated the ISP and contract filing requirements for arrangements with foreign providers that lack market power;
- eliminated the ISP for arrangements with all providers on routes where rates to terminate US calls are at least 25 per cent lower than the relevant settlement rate benchmark previously adopted by the FCC in 1997 (see table A.4);

- adopted changes to contract filing requirements to permit US carriers to file arrangements on a confidential basis with foreign providers with market power on routes where the ISP is removed;
- adopted procedural changes to simplify accounting rate filing requirements; and
- eliminated the flexibility policy (largely superfluous because of the above reforms to the ISP).

The FCC presumes that a foreign provider does not possess market power on the foreign end of a US international route if it possesses less than 50 per cent market share in each of the following foreign product markets: international transport facilities including cable landing station access and backhaul facilities; intercity facilities and services; and local facilities and services. It issued a list recently which identified foreign providers which do not qualify for this presumption (and are thus still subject to the ISP). Telstra was identified as a foreign provider having market power in Australia (FCC 1999c, p. 1). However, Telstra has indicated that as there is an approved International Simple Resale route between Australia and the United States, it is not subject to the proportional return and parallel accounting requirements of the International Settlements Policy and can file its call rates confidentially (sub. D18, p. 4).

B Participation in the inquiry

Submissions

Submissions designated 'D' were received after the Commission's Position Paper was finalised.

Participant	Submission No.
AAPT Telecommunications	D15
Australian Communications Authority	7
Australian Competition and Consumer Commission	10, D20
Australian Information Industry Association	2
Australian Telecommunications Users Group	3
Cable and Wireless Optus	5
Department of Communications, Information Technology and the Arts	6
Department of Foreign Affairs and Trade	11
Global One Communications	13
PanAmSat	9
Public Interest Advocacy Centre	1
Rail Access Corporation	D14
Telstra	4, 8, 12, D16, D17, D18, D19

Public hearing

To receive comment on the Position Paper, a public hearing was held in Sydney on 21 July 1999. The following participated in the hearing:

Telstra
Rail Access Corporation

Informal discussions and visits

Note: * indicates that discussions were held both before and after the release of the Commission's Position Paper.

AAPT
Australian Business
Australian Communications Authority
Australian Competition and Consumer Commission

Australian Information Industry Association (joint meeting including a representative of the National Bandwidth Inquiry secretariat)
Australian Telecommunications Users Group
Cable & Wireless Optus
Communications Research Unit (of DOCITA)
Department of Communications, Information Technology and the Arts*
Department of Foreign Affairs and Trade*
EQUANT
Henry Ergas and Tony Warren
Hutchison Telecoms
P & O Australia
Telstra

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