

**Changes in the prices paid for
telecommunications services in Australia
1996–97 to 1999–2000**

April 2001



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ISBN 0 642 402906

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Glossary and abbreviations

ABS	Australian Bureau of Statistics.
ACA	Australian Communications Authority.
ACCC	Australian Competition and Consumer Commission.
Basic access	The line rental or annual charge paid by consumers for access to a PSTN network.
Carrier	Holder of a carrier licence granted under the <i>Telecommunications Act 1997</i> .
CDMA	Code division multiple access (an access technique for digital wireless communications, including mobile phone and satellite services).
Community call	Calls charged at a cheaper rate than standard national long-distance calls for calls between non-adjacent charging zones in metropolitan areas and between metropolitan and particular country zones and other zones that have 'community access' to each other.
CPI	Consumer price index.
CRU	Communications Research Unit (a research unit within the Commonwealth Department of Communications, Information Technology and the Arts).
GSM	Global system for mobiles (wireless network technology).
ISDN	Integrated services digital network (ISDN services enable end-users to send and receive information at faster speeds and with greater reliability than is possible using the standard PSTN carriage service).
Leased line	Transmission capacity along a particular route in a carrier's network which is leased to a single customer end-user.
Pastoral call	Calls charged at a cheaper rate than standard national long-distance calls for calls within and between certain charge zones in country areas.
PSTN	Public switched telephone network (standard fixed-line telephone network).
OFTEL	Office of Telecommunications (UK telecommunications regulator).

Summary

Background

The Australian Competition and Consumer Commission is responsible for overseeing the development of a competitive telecommunications industry within Australia. Division 12 of part XIB of the *Trade Practices Act 1974* requires that the Commission must monitor and report each financial year to the Minister on prices paid by consumers for telecommunications services.

In the last two years the division 12 reports have reported the movement in prices for telecommunications services in dollar values for each service. The prices have been the standard prices listed by the carriers for services subject to a price cap and discounts have not been deducted. Prices for services with multiple tariff categories have been weighted averages across the categories. In last year's report a supplementary analysis was undertaken to show the movements in the average prices paid after discounts, but still for each service separately.

The Commission has decided to implement an alternative analytical approach for this and future reports to make the division 12 report more informative. The approach is a basket approach, which uses index numbers to analyse movements in prices. An index number, in the context of prices of a bundle of telecommunications services, is a summary measure of the general price level of the services in one period relative to another. Index numbers therefore provide a summary measure of price changes over time, but provide no information about price levels.

In addition to presenting a series of indexes showing the changes in price of several baskets of telecommunications services, the report also presents points contribution data and an explanation of how to use it to draw inferences from the indexes. This resource allows an analyst to estimate, for example, how much the price of the full basket of telecommunications services may change if the price of a particular service increases or decreases by an assumed amount.

The index model

Consumers

The index covers all consumers and the changes in price for two broad groups, business and residential, are identified in the indexes.

Services and baskets

The coverage of services in the index has been made as wide as possible to ensure the index is founded on a basket of services that is representative of consumption patterns on average. The services supplied on the PSTN network that are included in the index are:

- basic access;
- local calls;
- national long-distance calls;
- international calls; and
- calls from fixed to mobile phones.

Moreover, the services associated with mobile telephony that are provided on the wireless networks are also included.

The composition of each basket used in the index is determined by the pattern of use by consumers on average. The expenditure share of a service determines its importance in a basket. Thus, for a change in price of a given quantum, those services on which consumers as a group spend the most have the most influence on movements in the value of the index.

Carriers

Data have been obtained from five carriers to ensure that the index covers movements in price across the vast majority of the market. The carriers included are:

- AAPT
- Cable & Wireless Optus
- One.Tel
- Telstra
- Vodafone

Prices paid

To capture the effects of discounts and specials on prices paid, yield data were used to derive the necessary price data for the fixed-line services included in the index. This provides an estimate of the average price paid for a unit of a telecommunications service consumed in a year. In the market for national long-distance calls, for example, it provides an estimate of the average price paid for a call minute during a year. The data were reported in a limited way in the 1999 division 12 report.

Yield data could not be used for mobile telephony because of the marketing methods by which it is sold and the nature of the revenue records kept by the carriers. The Communications Research Unit's (CRU) approach to the problem of estimating prices for mobile services has

been to treat mobile telephony as a bundle of services and then to measure the prices paid by consumers for these bundles.

Quality of service

The measured changes in price have not been adjusted to account for changes in quality. Given the current state of knowledge, it is not possible to do anything other than acknowledge that a bias exists. For example, when quality is improving and prices are declining, the measured price change understates the real or pure price change. The ABS (1997) follows the same practice in the consumer price index (CPI) for these and a small group of other high-risk services.

Outputs

The index model produces several indexes rather than one single index. The structure of the model permits it to be added up to several levels, each of which produces a sub-index that provides a rich array of information on price changes in particular parts of the market for telecommunications services.

For each index, or basket of services, the following changes are discussed:

- changes in the index and therefore changes in prices paid on average for the relevant basket of services being analysed;
- the year-on-year percentage changes in the index and contributions made by its major components; and
- the changes in price of individual services that contribute most to each year-on-year change of the index.

The indexes presented in this report track changes in telecommunications prices between 1996–97 and 1999–2000.

All the indexes reflect changes in real prices. All the revenue and price data are expressed in 1999–2000 dollars in the index model.

In addition to discussing the index for each PSTN service, the tariff structure for each service as set out in publicly available sources on standard or list prices and some of the discount plans available to consumers is also discussed.

Main findings

The main findings are summarised below.

The primary index: changes in prices across all services and consumers

The price of the full basket of telecommunications services decreased by 17.5 per cent between 1996–97 and 1999–2000. The price decreased steadily by 4.4 and 5 per cent between 1996–97 and 1997–98, and 1997–98 and 1998–99. The rate of decrease accelerated significantly to 9.2 per cent between 1998–99 and 1999–2000 (chapter 3).

Index for PSTN services consumed by residential consumers

The price of the residential PSTN basket decreased by 17.2 per cent between 1996–97 and 1999–2000. The price decreased steadily by 5.3 and 5.2 per cent between 1996–97 and 1997–98, and 1997–98 and 1998–99. The rate of decrease accelerated to 7.7 per cent between 1998–99 and 1999–2000 (chapter 4).

Index for PSTN services consumed by business consumers

The price of the business PSTN basket decreased by 15.6 per cent between 1996–97 and 1999–2000. The price decreased at an accelerating rate over the analysis period. The decrease started at 3.4 per cent between 1996–97 and 1997–98 and accelerated to 5.6 and 7.4 per cent between 1997–98 and 1998–99, and 1998–99 and 1999–2000 (chapter 5).

Index for mobile telephony

There has been a steady decrease in the price of mobile telephony between 1996–97 and 1998–99. Over the two years the annual decreases were around 3.4 and 3.9 per cent. There was a much sharper decrease between 1998–99 and 1999–2000 of around 12.6 per cent. Over the whole period the cost of mobile telephony decreased by around 18.9 per cent (chapter 6).

Index for basic access

Basic access refers, in this report, to the annual service charge paid by consumers for accessing the PSTN networks. It excludes the once off charges levied when consumers first connect to a network.

The price of the basic access did not change much between 1996–97 and 1998–99. Re-balancing took effect during 1999–2000 and during that year the price increased by 9.5 per cent (chapter 7).

Index for local calls

The price of the local calls decreased by 13 per cent between 1996–97 and 1999–2000. The price decreased slightly by 3 per cent between 1996–97 and 1997–98 and less than 1 per cent between 1997–98 and 1998–99. The rate of decrease increased significantly to 9.6 per cent between 1998–99 and 1999–2000 as increased competition and re-balancing took effect (chapter 7).

Index for national long-distance calls

The price of the national long-distance calls decreased by 23.5 per cent between 1996–97 and 1999–2000. The price decreased at a significant rate over the analysis period. The rate of decrease was 9.7 per cent between 1996–97 and 1997–98 and a somewhat lower 6.2 per cent between 1997–98 and 1998–99. The rate of decrease was again 9.7 per cent between 1998–99 and 1999–2000 (chapter 7).

Index for international calls

The price of international calls decreased by 53 per cent between 1996–97 and 1999–2000. The price decreased at a significant and increasing rate over the analysis period. The rate of decrease was 14.1 per cent between 1996–97 and 1997–98 and this increased to 23.9 and 28.1 per cent between 1997–98 and 1998–99, and 1998–99 and 1999–2000 (chapter 7).

Index for calls from fixed to mobile services

The price of calls from fixed to mobile services decreased by 7.9 per cent between 1996–97 and 1999–2000. The price increased by 5.9 per cent between 1996–97 and 1997–98 before it began a downward trend over the rest of the analysis period. It decreased by 5.3 and 8.1 per cent between 1997–98 and 1998–99, and 1998–99 and 1999–2000 (chapter 7).

Index for PSTN services consumed inside of capital cities

The price of the PSTN capital basket decreased by 25 per cent between 1996–97 and 1999–2000. The decrease in price was 3.5 per cent between 1996–97 and 1997–98 and accelerated to 11.7 and 11.9 per cent between 1997–98 and 1998–99, and 1998–99 and 1999–2000 (chapter 8).

Index for PSTN services consumed outside of capital cities

The price of the PSTN non-capital basket decreased by 22.4 per cent between 1996–97 and 1999–2000. The decrease in price was 2.5 per cent between 1996–97 and 1997–98 and accelerated to 10.9 and 10.7 per cent between 1997–98 and 1998–99, and 1998–99 and 1999–2000 (chapter 8).

1. Introduction

Background

The Australian Competition and Consumer Commission is responsible for overseeing the development of a competitive telecommunications industry within Australia. Division 12 of part XIB of the Trade Practices Act requires that the Commission must monitor and report each financial year to the Minister on prices paid by consumers for telecommunications services.

In the last two years the division 12 reports have reported the movement in prices for telecommunications services in dollar values for each service. The prices have been the standard prices listed by the carriers for services subject to a price cap and discounts have not been deducted. Prices for services with multiple tariff categories have been weighted averages across the categories. In last year's report a supplementary analysis was undertaken to show the movements in the average prices paid after discounts, but still for each service separately.

The Commission has decided to implement an alternative analytical approach for this and future reports to make the division 12 report more informative. The approach is a basket approach, which uses index numbers to analyse movements in prices. An index number, in the context of prices of a bundle of telecommunications services, is a summary measure of the general price level of the services in one period relative to another.¹ Index numbers thus provide a summary measure of price changes over time, but provide no information about price levels.

The Commission took this decision after it considered a paper that the Communications Research Unit (CRU) prepared on the relative merits of a basket approach compared to the previous approach to the division 12 report.² Industry participants are, by and large, supportive of the new approach. The Commission also contracted the CRU to develop the index and prepare this report in consultation with the Commission.

Why adopt a basket approach?

The Commission adopted a basket approach because it believes that is more informative and better able to meet the statutory reporting requirement of the Trade Practices Act.

1 In the division 12 report the Commission is concerned with changes in price over time. Index numbers may also measure differences in price between geographical areas as, for example, in the two studies into international comparisons completed by the Productivity Commission (1999 and 1999a).

2 The CRU is a research unit in the Commonwealth Department of Communications, Information Technology and the Arts.

The purpose of division 12 and the target audience

Being a statutory requirement of the Trade Practices Act, the division 12 report is designed to assist Government and regulators make policy and regulatory decisions and, more generally, facilitate broader discussion about the progress of telecommunications reform in Australia. Although it is a report to the Minister and his department, the ACCC, the Australian Communications Authority (ACA) and other government departments use the report. Industry participants and consumer groups have also taken an interest in previous report findings.

Advantages and disadvantages of a basket approach

The major advantage of adopting a basket approach for the division 12 report is the ability of an index number to summarise a large amount of disaggregated price data in a meaningful way for analysts, regulators and policy makers. This is particularly the case for services with widely varying prices and price movements. As mentioned, an index number series shows unambiguously how, on average, prices of a basket of services change.³ By comparison, the presentation of disaggregated data as in previous division 12 reports has limitations. It would be difficult, for example, for an analyst to glean quickly any insight as to the overall price movement for telecommunications services when the prices for some services decrease and increase at varying rates while others remain unchanged. Moreover, the disaggregated data could be misleading in certain circumstances. If, for example, the price of an individual service decreases significantly, it could give the impression that on average, consumers are paying lower prices for telecommunications services. This, however, may be incorrect. If consumers use the service sparingly compared to other services and the price of another service that is used heavily increases slightly on average, they could be paying more for telecommunications services.

Other advantages of adopting a basket approach for the division 12 report are that it may provide:

- an insight into the important drivers of changes in the aggregate price of telecommunications services after considering the change in price and importance in the basket of each service;
- the ability to conduct ‘what if’ experiments of interest to regulators and policy makers;
 - appendixes 2 and 3 describe how to analyse the sources of changes in price and conduct ‘what if’ experiments. They also provide the necessary data for those wishing to undertake these types of investigations; and
- a comparison of changes in the aggregate price level between periods of irregular and regular length.

3 A convenient way to analyse and interpret index numbers is the percentage change in their value between two points in time.

There are, however, some disadvantages of adopting a basket approach. These are:

- the loss of information about non-average baskets of services that may in some instances be of interest to policy makers, regulators and the public; and
- the increased complexity in constructing a credible index for a basket of telecommunications services compared to calculating a weighted average price for each service.

On balance, however, the advantages appear to outweigh the disadvantages for the division 12 reporting requirement.

2. The index model

Coverage

Consumer types

The index covers all types of consumers. Two broad groups of consumers, business and residential, are identified in the outputs because each uses different services more heavily and are likely to have differing abilities to negotiate discounts on the listed prices.

Services

The coverage of services in the index has been made as wide as possible to ensure the index is founded on a basket of services that is representative of consumption patterns on average. The services supplied on the PSTN network that are included in the index are:

- basic access;
- local calls;
- national long-distance calls;
- international calls; and
- calls from fixed to mobile phones.

The services associated with mobile telephony, provided on the wireless networks, are also discussed.

The composition of each basket used in the index is determined by the pattern of use by consumers on average. The expenditure share of a service determines its importance in a basket. Thus, for a change in price of a given quantum, those services on which consumers as a group spend the most have the most influence on movements in the value of the index.

The lack of good quality data held by the carriers prevented the coverage of the index from being more extensive. In particular it excludes:

- community, pastoral and operator assisted calls as individual PSTN services;
- services that are provided on the ISDN networks; and
- leased lines.

Carriers

Data have been obtained from five carriers to ensure that the index covers movements in price across the vast majority of the market.⁴ This will ensure that the index is representative of movements in price for consumers on average. The carriers included are:

- AAPT
- Cable & Wireless Optus
- One.Tel
- Telstra
- Vodafone

Analysis period

The index presented in this report tracks changes in telecommunications prices between 1996–97 and 1999–2000.

Prices paid

The fixed network

As reported earlier, the Trade Practices Act requires that the Commission report on **prices paid** for telecommunications services. This implies that ideally, retail prices should be used after the deduction of discounts and concessions. The ABS follows this practice when constructing the CPI, which also aims to show changes in prices paid.

Data on actual prices paid are not readily available, particularly for past periods, because little data are archived about discounts and short-term specials, which carriers have increasingly offered. Additionally, many discount plans kick in only after a threshold value or number of calls has been made. It is difficult to establish retrospectively the degree to which customers have not taken advantage of discounts by falling short of the thresholds.

Because of the difficulty in obtaining yield data, the previous division 12 reports used the standard or list prices to construct weighted averages for each service reported. However, standard prices are the maximum consumers pay since these exclude all discounts and short-term specials. The previously used weighted averages thus produced a lower bound estimate of price reductions and an upper bound of increases.

To capture the effects of discounts and specials on prices paid, yield data have been used to derive the necessary price data for the fixed-line services included in the index. This provides an estimate of the average price paid for a unit of a telecommunications service consumed in a

4 Data from a sixth carrier could not be compiled in time for inclusion in the analysis.

year. In the market for national long-distance calls, for example, it provides an estimate of the average price paid for a call minute during a year.⁵

Mobile telephony

Yield data could not be used for mobile telephony because of the marketing methods by which it is sold and the nature of the revenue records kept by the carriers. To make calls on a mobile network, consumers require a mobile handset, connection and ongoing access to a mobile network. Once connected to a mobile network, consumers can make calls that are subject to various charges and can access other services such as voice mail, usually for an additional fee. Companies that supply mobile telephony services offer these in ‘plans’ that are usually a combination of call, access and handset charges. Furthermore, many of the mobile plans contain a high degree of cross subsidisation, particularly those where the cost to carriers of low up-front charges for handsets are recovered through higher charges for monthly access and calls. Unfortunately, the carriers do not keep separate records of revenue earned from handset sales and it is therefore not possible to estimate a yield over all the elements of mobile telephony.

The CRU’s approach to the problem of estimating prices for mobile services has been to treat mobile telephony as a bundle of services and then to measure the prices paid by consumers for these bundles. The bundles are based on the number and pattern of calls made by consumers and include calls to all mobile networks and the fixed network. The price of each bundle is determined by adding the cost of the handset, connection, monthly access and call charges, net of any discounts and free calls. There were not enough data to determine the use of text and voice messages and these were excluded from the bundles.⁶

Quality of service

Quality may be interpreted to mean all the non-price attributes of a product or service. It would thus include, for example, performance, reliability and features of the product or service. The Productivity Commission (1999, p. 151) adopted the following definition for quality:

... the totality of attributes embodied in (or associated with) a product or service that directly interact with the enjoyment (or utility) that consumers derive from that good or service ...

If changes in quality are ignored in the analysis of price change for telecommunications services, the measured change may not be a pure price change. If quality does change and it can be measured, the base period price may be adjusted to reflect the quality change. The measured change in price after the adjustment is then a pure price change. However, the adjustment is difficult to make for telecommunications services. The ABS (1997) has no satisfactory

5 Using yield data presents a difficulty in some circumstances. Please see appendix 1 for a detailed discussion.

6 See appendix 1 for a detailed discussion on estimating the price of mobile telephony.

arrangements in place to adjust the prices of these services in the CPI to reflect changes in quality — even though changes in quality are thought to be significant for these services.

Under these circumstances, it is impossible to do anything other than acknowledge that a bias probably exists. This area needs further research.

Outputs

The index model produces several indexes rather than one single index. The structure of the model permits it to be added up to several levels, each of which produces a sub-index that provides a rich array of information on price changes in particular parts of the market for telecommunications services.

For each index, or basket of services, the following changes are discussed:

- changes in the index, and therefore changes in prices paid on average for the relevant basket of services being analysed;
- the year-on-year percentage changes in the index and contributions made by its major components; and
- the changes in price of individual services that contribute most to each year-on-year change of the index;
 - the contributions made by the changes in price of all the services in a basket may be derived from the data presented in appendix 3 and using the techniques described in appendix 2.

The contributions of changes in the price of individual components in the index to the year-on-year percentage changes in the index are not additive but multiplicative. If changes in the price of local calls, for example, comprise 5 and 7 per cent of the change in an index between the years t and $(t+1)$, and $(t+1)$ and $(t+2)$, they will not comprise 12 per cent of the change in the index between the years t and $(t+2)$.⁷

All the indexes reflect changes in real prices. All the revenue and price data are expressed in 1999–2000 dollars in the index model.⁸

7 These will comprise a change of $(1 + .05)(1 + .07) = 12.4$ per cent.

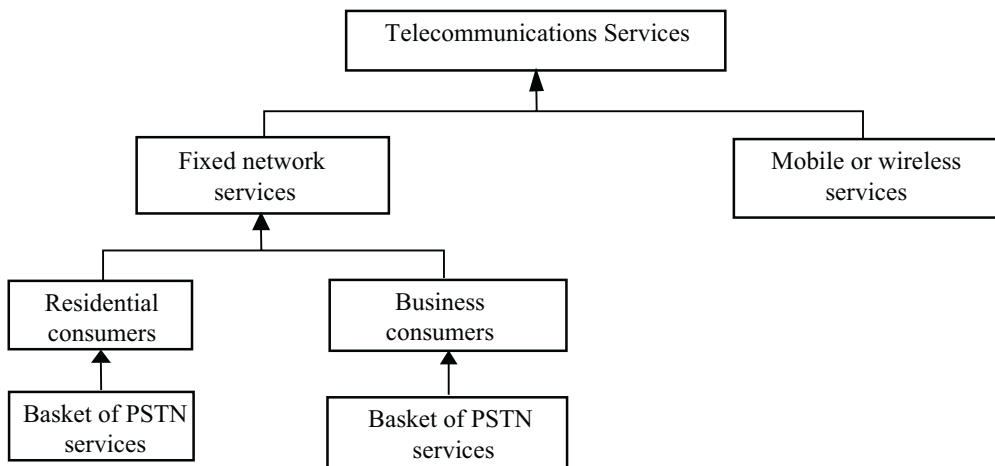
8 The nominal values were converted to 1999–2000 values using the CPI.

3. The primary index: changes in prices across all services and consumers

The index

The primary index provides a picture of how the cost of using telecommunications services has changed for all consumers on average.

Figure 1. The primary index



The structure also provides an insight into the contribution made by the different parts of the market to the change in the price paid by consumers for telecommunications services.

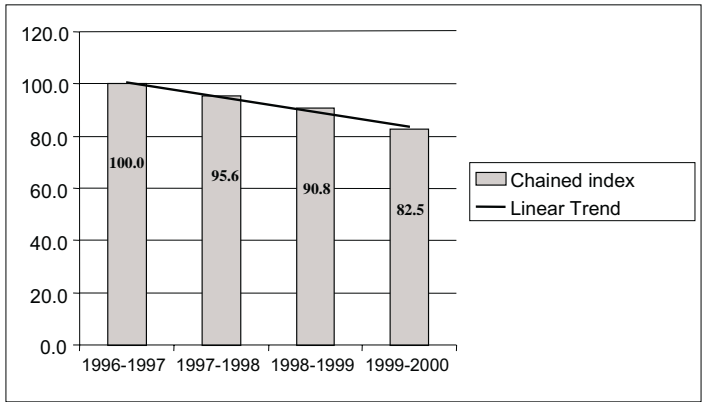
Change in prices paid

Overview: 1996–97 to 1999–2000

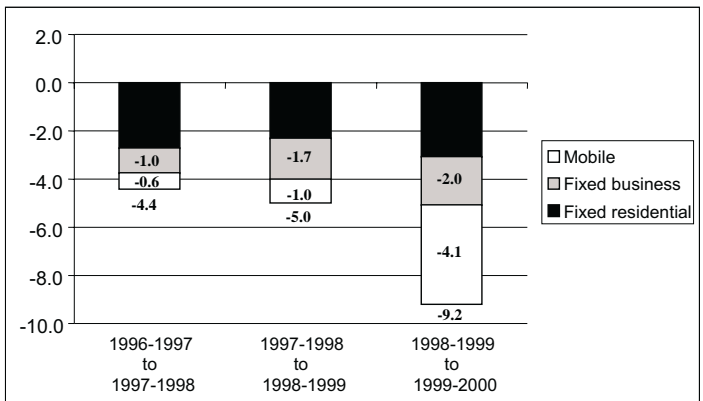
The price of the full basket of telecommunications services decreased by 17.5 per cent between 1996–97 and 1999–2000. The price decreased steadily by 4.4 and 5 per cent between 1996–97 and 1997–98, and 1997–98 and 1998–99. The rate of decrease accelerated significantly to 9.2 per cent between 1998–99 and 1999–2000 (figure 2).

Figure 2. Change in the price of telecommunications services, 1996–97 to 1999–2000

(a): Chained Index for the primary basket



(b): Year on year percentage changes for the primary basket^a



a: The sum of the percentage points attributed to each major component of the index may not sum to the total percentage change due to rounding.

Source: CRU estimates based on data supplied by AAPT, C&W Optus, One.Tel, Telstra and Vodafone.

1996–97 to 1997–98

The decrease in price between 1996–97 and 1997–98 was dominated by the change in the price of the basket of PSTN services consumed by residential consumers. Between these years:

- the price of the residential basket decreased by 5.3 per cent and this comprised 62.1 per cent of the decrease in the full basket, or 2.7 points of the 4.4 percentage point decrease in the price of the full basket;
- the price of the business basket decreased by 3.4 per cent and this comprised 23.3 per cent of the decrease in the full basket, or 1 point of the 4.4 percentage point decrease in the price of the full basket; and
- the price of the basket for mobile telephony decreased by 3.4 per cent and this comprised 14.6 per cent of the decrease in the full basket, or 0.6 points of the 4.4 percentage point decrease in the price of the full basket.

The individual services that made the largest contributions to the change in the price of the full basket between 1996–97 and 1997–98 were:

- national long-distance calls made by residential consumers (the price of these calls decreased by 10.8 per cent and this comprised 32.3 per cent of the decrease in the price of the full basket);
- international calls made by residential consumers (the price of these calls decreased by 12.3 per cent and this comprised 21.1 per cent of the decrease in the price of the full basket); and
- national long-distance calls made by business consumers (the price of these calls decreased by 8.1 per cent and this comprised 16.6 per cent of the decrease in the price of the full basket).⁹

1997–98 to 1998–99

Contributions to the decrease in price of the full basket were more even between 1997–98 and 1998–99 than between 1996–97 and 1997–98. Between 1997–98 and 1998–99:

- the price of the residential basket decreased by 5.2 per cent and this comprised 46.7 per cent of the decrease in the full basket, or 2.3 points of the 5 percentage point decrease in the price of the full basket;
- the price of the business basket decreased by 5.6 per cent and this comprised 33.8 per cent of the decrease in the full basket, or 1.7 points of the 5 percentage point decrease in the price of the full basket; and

9 The contributions of other services to the change in the price of the basket between 1996–97 and 1997–98 may be derived from the data in table A3.1. Data for deriving contributions to the changes in price between 1997–98 and 1998–99, and 1998–99 and 1999–2000 are listed in tables A3.2 and A3.3. The three largest contributions for these years are listed in the following passages.

-
- the price of the basket for mobile telephony decreased by 3.9 per cent and this comprised 19.5 per cent of the decrease in the full basket, or 1 point of the 5 percentage point decrease in the price of the full basket.

The individual services that made the largest contributions to the change in the price of the full basket between 1997–98 and 1998–99 were:

- international calls made by residential consumers (the price of these calls decreased by 23.7 per cent and this comprised 27.2 per cent of the decrease in the price of the full basket);
- international calls made by business consumers (the price of these calls decreased by 24.3 per cent and this comprised 12.9 per cent of the decrease in the price of the full basket); and
- national long-distance calls made by residential consumers (the price of these calls decreased by 4.8 per cent and this comprised 11.2 per cent of the decrease in the price of the full basket).

1998–99 to 1999–2000

The proportional contributions of the services to the decrease in price of the full basket between 1998–99 and 1999–2000 differed significantly from previous years with the emergence of mobile telephony as the leading contributor. Between 1998–99 and 1999–2000:

- the price of the residential basket decreased by 7.7 per cent and this comprised 33.4 per cent of the decrease in the full basket, or 3.1 points of the 9.2 percentage point decrease in the price of the full basket;
- the price of the business basket decreased by 7.4 per cent and this comprised 22.1 per cent of the decrease in the full basket, or 2 points of the 9.2 percentage point decrease in the price of the full basket; and
- the price of the basket for mobile telephony decreased by 12.6 per cent and this comprised 44.5 per cent of the decrease in the full basket, or 4.1 points of the 9.2 percentage point decrease in the price of the full basket (the increased contribution of mobile telephony occurred because its price decreased by a significantly larger magnitude than in either of the previous periods and its weight in the basket had increased to 32.5 per cent in 1998–99, compared to 25.2 and 18.6 per cent in 1997–98 and 1996–97).

The services, other than mobile telephony, that made the largest contributions to the change in the price of the full basket between 1997–98 and 1999–2000 were:

- local calls made by residential consumers (the price of these calls decreased by 10.5 per cent and this comprised 14.5 per cent of the decrease in the price of the full basket);

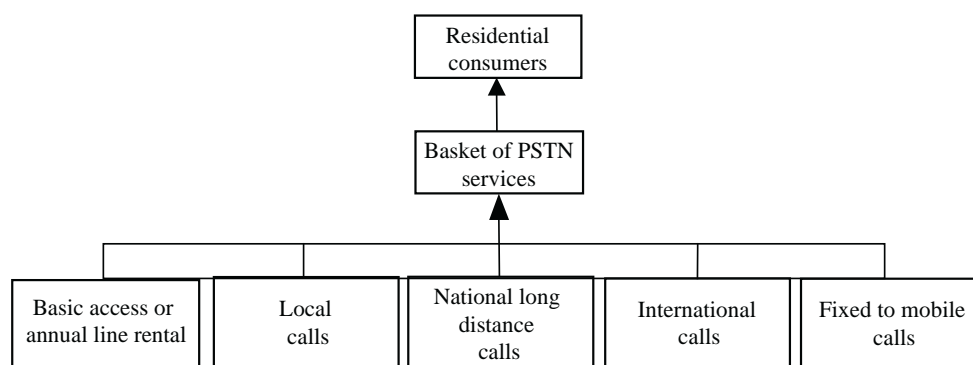
-
- international calls made by residential consumers (the price of these calls decreased by 27.5 per cent and this comprised 13.3 per cent of the decrease in the price of the full basket);
 - the large decrease in the price of residential international calls made a smaller contribution to the decrease in the price of the basket than the much smaller decrease in the price of residential local calls because its weight in the basket is around one-third the size of the weight for local calls in 1997–98; and
 - national long-distance calls made by residential consumers (the price of these calls decreased by 10.2 per cent and this comprised 11.1 per cent of the decrease in the price of the full basket).

4. Index for PSTN services consumed by residential consumers

The index

The index for PSTN services consumed by residential consumers shows how prices have changed on average for a basket of goods that reflects the consumption pattern of residential consumers on average (figure 3).

Figure 3. Index for prices of PSTN services consumed by residential consumers



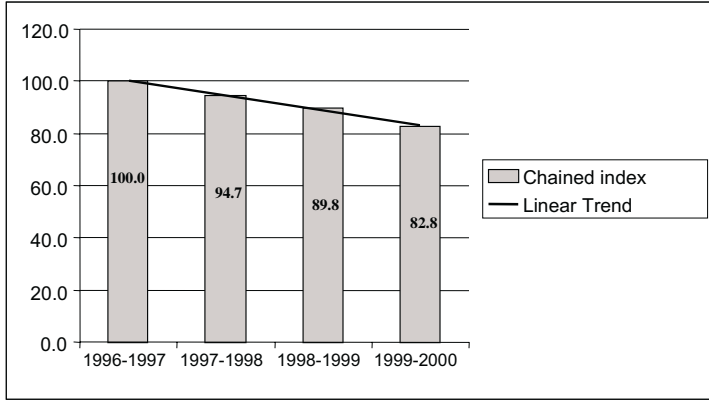
Change in prices paid

Overview: 1996–97 to 1999–2000

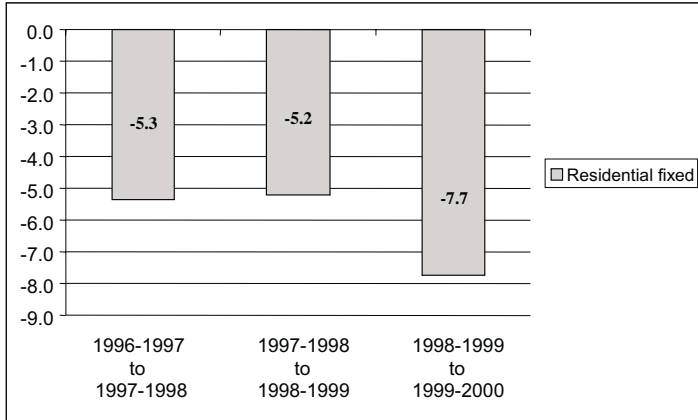
The price of the residential PSTN basket decreased by 17.2 per cent between 1996–97 and 1999–2000. The price decreased steadily by 5.3 and 5.2 per cent between 1996–97 and 1997–98, and 1997–98 and 1998–99. The rate of decrease accelerated to 7.7 per cent between 1998–99 and 1999–2000 (figure 4).

Figure 4. Change in the price of PSTN services consumed by residential consumers

(a): Chained Index for residential fixed basket



(b): Year on year percentage changes in the index for the residential fixed basket^a



a: The sum of the percentage points attributed to each major component of the index may not sum to the total percentage change due to rounding.

Source: CRU estimates based on data supplied by AAPT, C&W Optus, One.Tel and Telstra.

1996–97 to 1997–98

The individual services that made the largest contributions to the change in the price of the residential PSTN basket between 1996–97 and 1997–98 were:¹⁰

- national long-distance calls (the price of these calls decreased by 10.8 per cent and this comprised 52 per cent of the decrease in the price of the basket);
- international calls (the price of these calls decreased by 12.3 per cent and this comprised 33.9 per cent of the decrease in the price of the basket); and
- local calls (the price of these calls decreased by 4 per cent and this comprised 23.7 per cent of the decrease in the price of the basket).¹¹

1997–98 to 1998–99

The individual services that made the largest contributions to the change in the price of the residential PSTN basket between 1997–98 and 1998–99 were:

- international calls (the price of these calls decreased by 23.7 per cent and this comprised 58.2 per cent of the decrease in the price of the basket);
- national long-distance calls (the price of these calls decreased by 4.8 per cent and this comprised 24 per cent of the decrease in the price of the basket); and
- calls from fixed to mobile services (the price of these calls decreased by 4.4 per cent and this comprised 7.7 per cent of the decrease in the price of the basket).

1998–99 to 1999–2000

The individual services that made the largest contributions to the change in the price of the residential PSTN basket between 1998–99 and 1999–2000 were:

- local calls (the price of these calls decreased by 10.5 per cent and this comprised 43.3 per cent of the decrease in the price of the basket);

10 The percentage contributions to the decrease in price will sum to more than 100 where the price of some services in the index increases. In these cases, the contribution of each service is expressed as a percentage of the net decrease in the price of the basket and the sum of the contributions of those services whose price decreases must be greater than the net decrease.

11 The contributions of other services to the change in the price of the basket between 1996–97 and 1997–98 may be derived from the data in table A3.4. Data for deriving contributions to the changes in price between 1997–98 and 1998–99, and 1998–99 and 1999–2000 is listed in tables A3.5 and A3.6. The three largest contributions for these years are listed in the following passages.

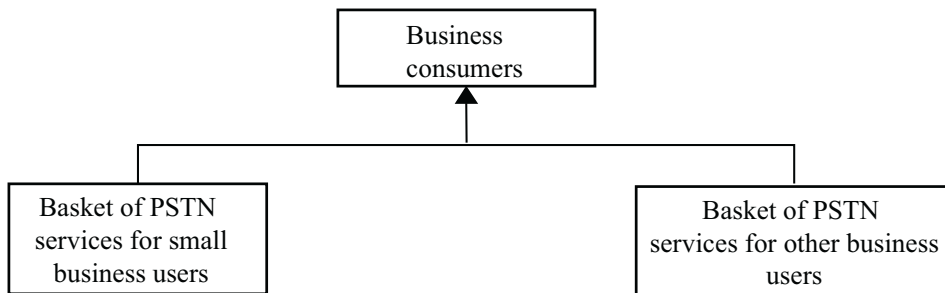
-
- international calls (the price of these calls decreased by 27.5 per cent and this comprised 39.7 per cent of the decrease in the price of the basket);
 - the large decrease in the price on residential international calls made a smaller contribution to the decrease in the price of the basket than the much smaller decrease in the price of residential local calls because its weight in the basket is around one-third the size of the weight for local calls in 1998–99; and
 - national long-distance calls (the price of these calls decreased by 10.2 per cent and this comprised 33.3 per cent of the decrease in the price of the basket).

5. Index for PSTN services consumed by business consumers

The index

The index PSTN services consumed by business consumers shows how prices have changed on average for a basket of services that reflects the consumption pattern of business consumers on average (figure 5).

Figure 5. Index for prices of PSTN services consumed by business consumers



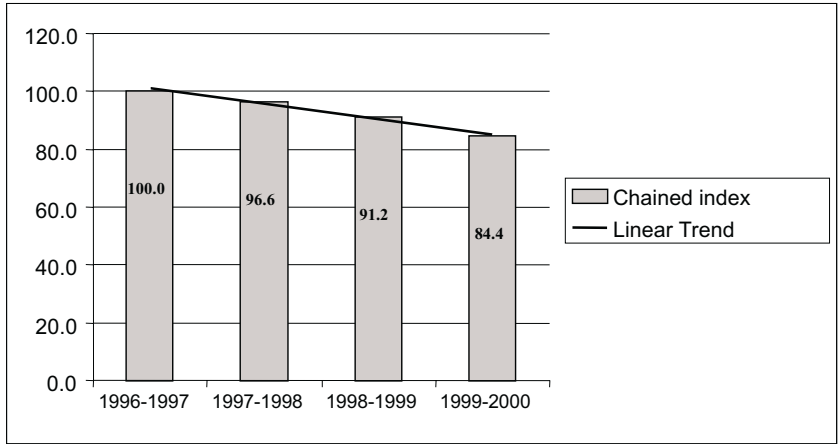
Change in prices paid

Overview: 1996–97 to 1999–2000

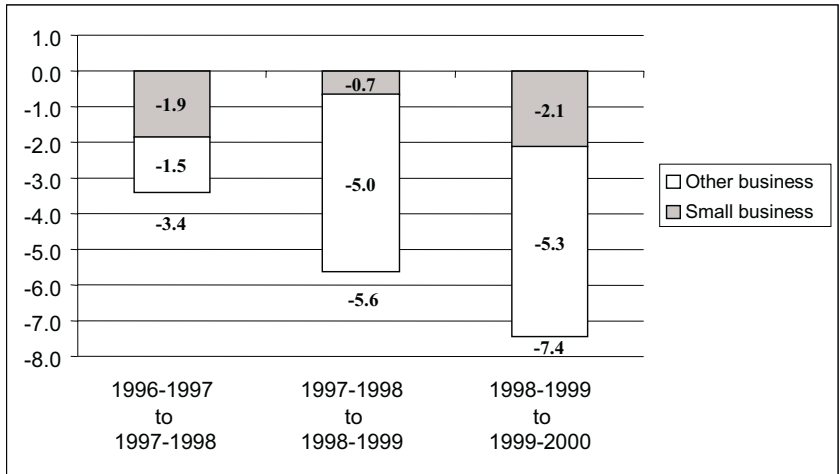
The price of the business PSTN basket decreased by 15.6 per cent between 1996–97 and 1999–2000. The price decreased at an accelerating rate over the analysis period. The decrease started at 3.4 per cent between 1996–97 and 1997–98 and accelerated to 5.6 and 7.4 per cent between 1997–98 and 1998–99, and 1998–99 and 1999–2000 (figure 6).

Figure 6. Change in the price of PSTN services consumed by business consumers

(a): Chained index for PSTN services consumed by business consumers



(b): Year-on-year percentage changes in the index for PSTN services consumed by business consumers ^a



a: The sum of the percentage points attributed to each major component of the index may not sum to the total percentage change due to rounding.

Source: CRU estimates based on data supplied by AAPT, C&W Optus, One.Tel and Telstra.

1996–97 to 1997–98

Changes in the price of the small business PSTN basket made the largest contribution to the decrease in the price of the all business PSTN basket between 1996–97 and 1997–98. Between these years:¹²

- the price of the small business basket decreased by 7 per cent and this comprised 54.9 per cent of the decrease in the all business basket, or 1.9 points of the 3.4 percentage point decrease in the price of the all business basket; and
- the price of the other business basket decreased by 2.1 per cent and this comprised 45.1 per cent of the decrease in the all business basket, or 1.5 points of the 3.4 percentage point decrease in the price of the all business basket.

The individual services that made the largest contributions to the change in the price of the all business basket between 1996–97 and 1997–98 were:¹³

- national long-distance calls made by other business consumers (the price of these calls decreased by 6.7 per cent and this comprised 44.3 per cent of the decrease in the price of the all business basket);
- international calls made by other business consumers (the price of these calls decreased by 17.9 per cent and this comprised 30.1 per cent of the decrease in the price of the all business basket); and
- national long-distance calls made by small business consumers (the price of these calls decreased by 12.5 per cent and this comprised 27.2 per cent of the decrease in the price of the all business basket).¹⁴

The other business basket contributed less than the small business basket to the decrease in the price of the all business basket although it contained two out of the three services that made the highest individual contributions. The other business basket also contained two services, fixed to mobile calls and local calls, for which the price increased. In the small business basket, however, the price of the same services either increased by a similar proportion or decreased. Additionally, the weight in the all service basket of both services was higher when consumed by other business consumers than by small business consumers (table A3.7).

12 Unfortunately, there is no one single definition for small business consumers across the carriers at present. Telstra defines them as business customers with less than three lines. Optus uses the same definition as Telstra but consumers can and do request a classification change based on bill spend. AAPT defines them as business customers with five lines or less and One.Tel as business customers with less than five lines.

13 Please see footnote 10.

14 The contributions of other services to the change in the price of the basket between 1996–97 and 1997–98 may be derived from the data in table A3.7. Data for deriving contributions to the changes in price between 1997–98 and 1998–99, and 1998–99 and 1999–2000 are listed in tables A3.8 and A3.9. The three largest contributions for these years are listed in the following passages.

1997–98 to 1998–99

The changes in the price of the other business PSTN basket dominated the decrease in the price of the all business PSTN basket between 1997–98 and 1998–99. Between these years:

- the price of the small business basket decreased by 2.7 per cent and this comprised 11.6 per cent of the decrease in the all business basket, or 0.7 points of the 5.6 percentage point decrease in the price of the all business basket; and
- the price of the other business basket decreased by 6.5 per cent and this comprised 88.4 per cent of the decrease in the all business basket, or 5 points of the 5.6 percentage point decrease in the price of the all business basket.

The individual services that made the largest contributions to the change in the price of the all business basket between 1997–98 and 1998–99 were:

- national long-distance calls made by other business consumers (the price of these calls decreased by 10.4 per cent and this comprised 34.2 per cent of the decrease in the price of the all business basket);
- international calls made by other business consumers (the price of these calls decreased by 32.6 per cent and this comprised 31.4 per cent of the decrease in the price of the all business basket); and
- calls made from fixed to mobile services by other business consumers (the price of these calls decreased by 5.6 per cent and this comprised 16.8 per cent of the decrease in the price of the all business basket).

1998–99 to 1999–2000

The changes in the price of the other business PSTN basket again made the leading contribution to the decrease in the price of the all business PSTN basket between 1998–99 and 1999–2000. Between these years:

- the price of the small business basket decreased by 8.8 per cent and this comprised 28.7 per cent of the decrease in the all business basket, or 2.1 points of the 7.4 percentage point decrease in the price of the all business basket; and
- the price of the other business basket decreased by 7 per cent and this comprised 71.3 per cent of the decrease in the all business basket, or 5.3 points of the 7.4 percentage point decrease in the price of the all business basket.

The decrease in the price of the other business basket was smaller than the decrease in the price of the small business basket. The other business basket, however, still made a higher contribution to the decrease in the price of the all business basket. This occurred because the weight of the other business basket in the all business basket was more than three times larger than the weight of the small business basket in 1998–99 (table A3.9).

The individual services that made the largest contributions to the change in the price of the all business basket between 1998–99 and 1999–2000 were:

- calls made from fixed to mobile services by other business consumers (the price of these calls decreased by 9.1 per cent and this comprised 24 per cent of the decrease in the price of the all business basket);
- local calls made by other business consumers (the price of these calls decreased by 7.9 per cent and this comprised 23.5 per cent of the decrease in the price of the all business basket); and
- national long-distance calls by other business consumers (the price of these calls decreased by 8.1 per cent and this comprised 18.4 per cent of the decrease in the price of the all business basket).

The price of international calls made by small and other business consumers declined significantly by 36.3 and 25.4 per cent. These did not make the largest contributions to the change in the price of the all business basket, however, because of their small shares in it of 2.8 and 4.5 per cent (table A3.9).

The decreases in the prices of individual services were generally smaller for other business consumers than other small business consumers between 1998–99 and 1999–2000. The price decreases of services consumed by other business consumers, however, made larger contributions to the decrease in the price of the all business basket. This occurred because the weights in the all service basket of services consumed by other business consumers were larger than those consumed by small business consumers by several orders of magnitude in 1998–99 (table A3.9).

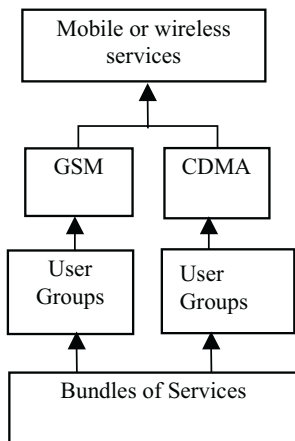
6. Index for mobile telephony

The index

The index for mobile telephony shows how the price of mobile telephony has changed on average for all consumers of GSM services. The structure for the index includes CDMA and GSM services but the CDMA component will not influence the results presented in this report because CDMA was introduced too recently. Baskets of services for five user groups are the building blocks for the index. The user groups, which vary by level of usage, are:

- very low
- low
- medium
- high
- very high

Figure 7. Index for mobile telephony



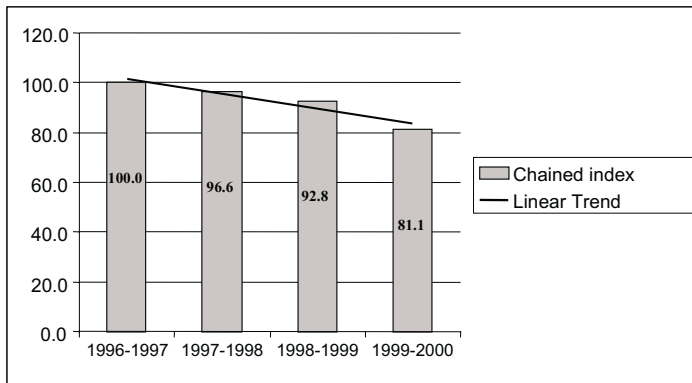
Change in prices paid

Overview: 1996–97 to 1999–2000

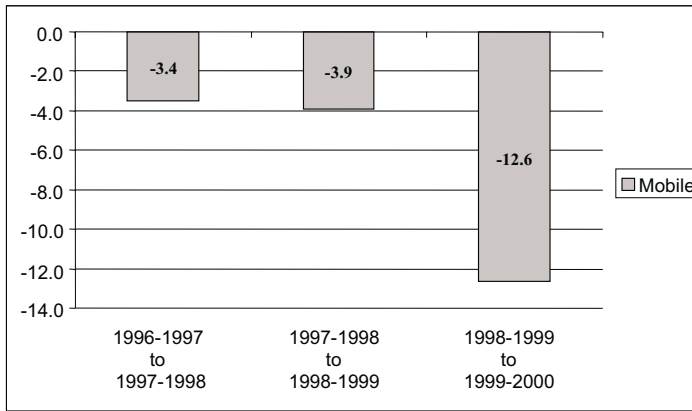
There has been a steady decrease in the price of mobile telephony between 1996–97 and 1998–99. Over the two years, the annual decreases were around 3.4 and 3.9 per cent. There was a much sharper decrease between 1998–99 and 1999–2000 of around 12.6 per cent. Over the whole period, the overall cost of mobile telephony decreased by around 18.9 per cent (figure 8).

Figure 8. Change in the price of mobile telephony, 1996–97 to 1999–2000

(a): Chained index for mobile telephony



(b): Year-on-year percentage changes in the index for mobile telephony^a



a: The sum of the percentage points attributed to each major component of the index may not sum to the total percentage change due to rounding.

Source: CRU estimates based on data supplied by, C&W Optus, Telstra and Vodafone.

Change in price for user groups: 1996–97 to 1999–2000

All user groups now pay considerably less for their mobile telephony than in 1996–97 and consumers appear to be benefiting from lower prices as the carriers try to increase their market shares. The most significant decreases have occurred for low and very low users, particularly over the last two years (table 1). This occurred because the per minute call charges in plans designed for very low users trended downward towards those paid by high users over the analysis period.¹⁵ Additionally, fixed charges decreased for all user groups. These had a more pronounced effect on the prices paid by very low users because these comprised a larger proportion of total costs for very low users than very high users.

¹⁵ During this period, per minute charges for high users did not fall significantly.

Table 1. Change in the price of mobile telephony by user groups, 1996–97 to 1999–2000

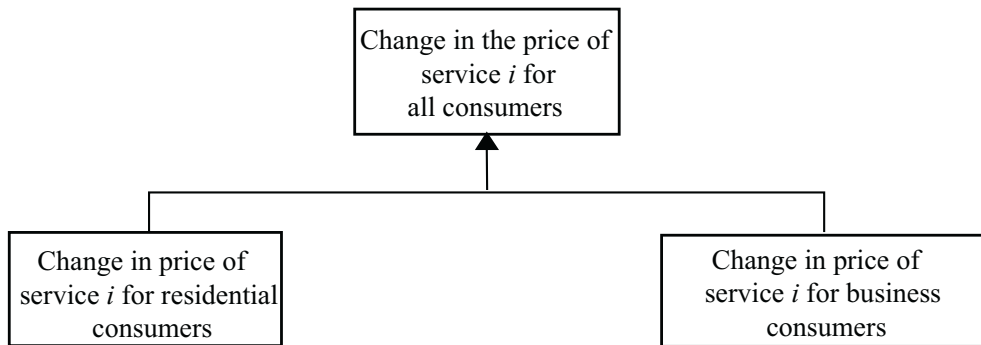
	1996–97	1997–98	1998–99	1999–2000
Very low user	100.00	94.55	74.60	53.00
Low user	100.00	95.69	87.99	72.37
Medium user	100.00	95.92	94.20	81.00
High user	100.00	95.57	89.25	78.80
Very high user	100.00	97.21	95.28	84.38

Source: CRU estimates based on data supplied by C&W Optus, Telstra and Vodafone.

7. Indexes for PSTN services consumed by all consumers

The index for each PSTN service shows changes in the prices paid on average by business and residential consumers (figure 9).

Figure 9. Index structure for each PSTN service



In addition to discussing each index this report discusses the tariff structure for each service as set out in publicly available sources on standard or list prices and some of the discount plans available to consumers. These will put the movements of the indexes into some context, although it must be remembered the magnitude of changes in the indexes will differ from changes in the standard prices. Standard prices do not include discounts and they are nominal values whereas the index uses real prices after the deduction of discounts. Nonetheless, the discussion will offer some insights as to why the index for each service moves in the way it does.

Basic access

Basic access refers, in this report, to line rental or the annual charge paid by consumers for accessing the PSTN networks. It excludes the once off charges levied when consumers first connect to a network.

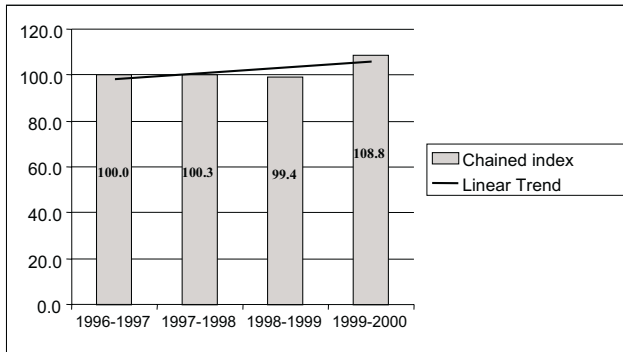
Changes in prices paid

Overview: 1996–97 to 1999–2000

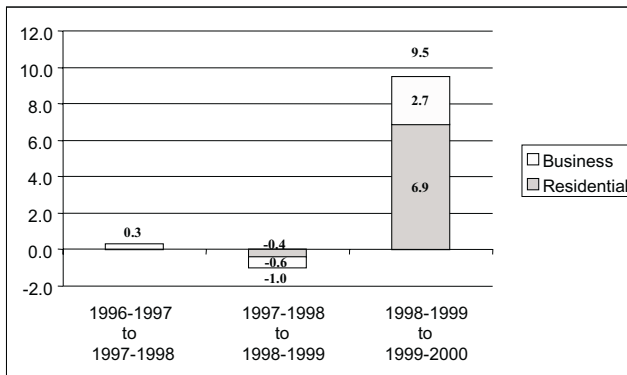
The price of the basic access did not change much between 1996–97 and 1998–1999 (figure 10). Re-balancing was introduced during 1999–2000 and contributed significantly to the price increase of 9.5 per cent in that year.¹⁶

Figure 10. Change in the price of basic access, 1996–97 to 1999–2000

(a): Chained index for basic access



(b): Year-on-year percentage changes in the index for basic access^a



a: The sum of the percentage points attributed to each major component of the index may not sum to the total percentage change due to rounding.

Source: CRU estimates based on data supplied by AAPT, C&W Optus, One.Tel and Telstra.

¹⁶ Re-balancing is explained briefly in the following section on standard or list prices.

1998–99 to 1999–2000

The changes in the price of basic access for residential consumers dominated the increase in the price of the basic access between 1998–99 and 1999–2000. Between these years:

- the price of basic access for residential consumers increased by 9.8 per cent and this comprised 72.1 per cent of the increase in the price of the basic access basket, or 6.9 points of the 9.5 percentage point increase in the price of the basic access basket; and
- the price of basic access for business consumers increased by 6.2 per cent and this comprised 27.9 per cent of the increase in the price of the basic access basket, or 2.7 points of the 9.5 percentage point increase in the price of the basic access basket.

Standard or list prices

Price structure and unit tariffs

Annual service fees are levied annually and do not depend on level of use. Consequently, these fees comprise a larger proportion of the total cost of a basic telephone service for low-volume users than high-volume users.

The level of the access charges levied by all carriers has remained static for most of the analysis period. In 1999–2000, however, Telstra increased its access charges by around 19 per cent for non-business and non-profit business consumers and 25 per cent for standard business consumers. One.Tel's charges for basic access rose by the same amount, being a service re-billed at Telstra's retail prices. AAPT also provides basic access by predominantly re-billing the Telstra service. C&W Optus did not change its price.

The price increases in 1999–2000 has resulted from re-balancing. Re-balancing is when the prices of services, such as basic access, that have previously been supplied at prices that are below cost are increased. Concurrently, the prices of services, such as local calls, that have previously been inflated to recover the resulting losses, are decreased. Re-balancing should result in a **net welfare gain to society** but there are winners and losers. The losers are the consumers of services whose prices increase and the winners are the consumers of services whose prices decrease. The prices of some services other than basic access have decreased significantly, due in part to re-balancing, amongst several other factors such as increased competition.¹⁷

17 A full explanation of the benefits of re-balancing is contained in appendix 3 of Collins P, McCutcheon M & Osioy E (2000).

Local calls

Change in prices paid

Overview: 1996–97 to 1999–2000

The price of the local calls decreased by 13 per cent between 1996–97 and 1999–2000. The price decreased slightly by 3 per cent between 1996–97 and 1997–98 and less than 1 per cent between 1997–98 and 1998–99. The rate of decrease increased significantly to 9.6 per cent between 1998–99 and 1999–2000 as increased competition and re-balancing took effect (figure 11).

1996–97 to 1997–98

The change in the price of local calls made by residential consumers dominated the decrease in the price of the local call basket between 1996–97 and 1997–98. Between these years:

- the price of local calls made by residential consumers decreased by 4 per cent and this comprised 90.2 per cent of the decrease in the price of the local call basket, or 2.7 points of the 3 percentage point decrease in the price of the local call basket; and
- the price of local calls made by business consumers decreased by 0.9 per cent and this comprised 9.8 per cent of the decrease in the price of the local call basket, or 0.3 points of the 3 percentage point decrease in the price of the local call basket.

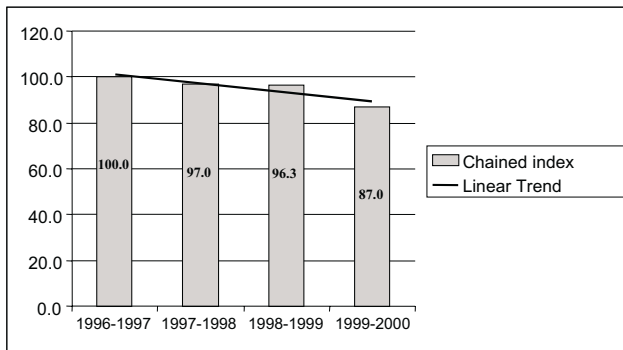
1997–98 to 1998–99

The price of local calls remained almost unchanged between 1997–98 and 1998–99. Between these years:

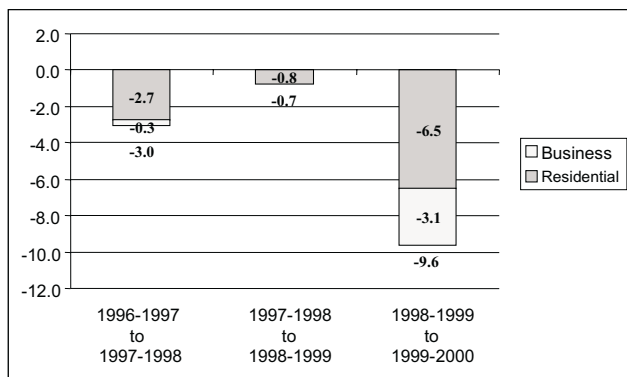
- the price of local calls made by residential consumers decreased slightly by 1.2 per cent and this was offset slightly by a small increase in price paid by business consumers.

Figure 11. Change in the price of local calls, 1996–97 to 1999–2000

(a): Chained index for local calls



(b): Year-on-year percentage changes in the index for local calls^a



a: The sum of the percentage points attributed to each major component of the index may not sum to the total percentage change due to rounding.

Source: CRU estimates based on data supplied by AAPT, C&W Optus, One.Tel and Telstra.

1998–99 to 1999–2000

The change in the price of local calls consumed by residential consumers made the leading contribution to the decrease in the price of the local call basket between 1998–99 and 1999–2000. Between these years:

- the price of local calls made by residential consumers decreased by 10.5 per cent and this comprised 67.5 per cent of the decrease in the price of the local call basket, or 6.5 points of the 9.6 percentage point decrease in the price of the local call basket; and
- the price of local calls made by business consumers decreased by 8.1 per cent and this comprised 32.5 per cent of the decrease in the price of the local call basket, or 3.1 points of the 9.6 percentage point decrease in the price of the local call basket.

Standard or list prices

Price structure and unit tariffs

Local calls are generally charged at a flat rate per call, irrespective of the duration of the call.

The listed price for local calls has remained stable over much of the analysis period.

- A Telstra local call remained at 25 cents between 1996 and 1999, and decreased to 22 cents in 2000. Pensioners now receive free local calls for the first \$1 worth of local calls per month. Before 2000 they paid 15 cents per call for the first 10 calls made each month.
- A C&W Optus local call remained at 20 cents between 1996 when it entered the local call market in Melbourne and Sydney and 2000. The 20 cent local call, however, is only offered to customers directly connected to C&W Optus’ network. Customers not directly connected

to its network pay 22 cents for local calls. Pensioners received a concession in 1996, paying 15 cents a call. This concession was removed in 1997.

- A One.Tel local call was 17.5 cents per call in 1999 and 2000 and its local call charges in previous years were re-billed at Telstra retail rates.
- An AAPT local call was 15 cents for its full service customers during 1998–99 when it started to supply this service and 1999–2000.

Discounts

Customers of Telstra and C&W Optus may reduce the somewhat higher standard price of their local calls by taking advantage of discount plans.

Consumers of Telstra local calls are eligible for Flexi-Plan[®] discounts through the EasySaver[™] packages. By paying a higher annual service charge, the price of a local call may be reduced by up to 28 and 52 per cent for households and businesses. The premium paid on the service charge to gain access to the cheaper local calls was reduced by 7 to 20 per cent for households in 2000, the size of the reduction contingent upon a consumer's level of use. These plans benefit average and high usage consumers more than low usage consumers.

Telstra introduced neighbourhood calls during 2000 priced at 15 cents per call. Neighbourhood calls are local calls made between two services connected to the same local exchange.

C&W Optus offers its long-distance customers the option of including their Telstra local calls on their C&W Optus bill for long-distance calls through Local Access Resale. Residential customers choosing this option received a 5 per cent discount on the cost of each 25 cent local call made with Telstra in 1999 and a 9 per cent discount on each 22 cent call made in 2000. Business customers received a discount of up to 12 per cent, the size of the discount being contingent upon the size of the local call bill.

Since 1997 C&W Optus has also offered its customers local calls for 15 cents on six special days a year, such as Christmas day.

National long-distance calls

Change in prices paid

Overview: 1996–97 to 1999–2000

The price of the national long-distance calls decreased by 23.5 per cent between 1996–97 and 1999–2000. The price decreased at a significant and steady rate over the analysis period. The rate of decrease was 9.7 per cent between 1996–97 and 1998–99, and 1998–99 and 1999–2000, and 6.2 per cent between 1997–98 and 1998–99 (figure 12).

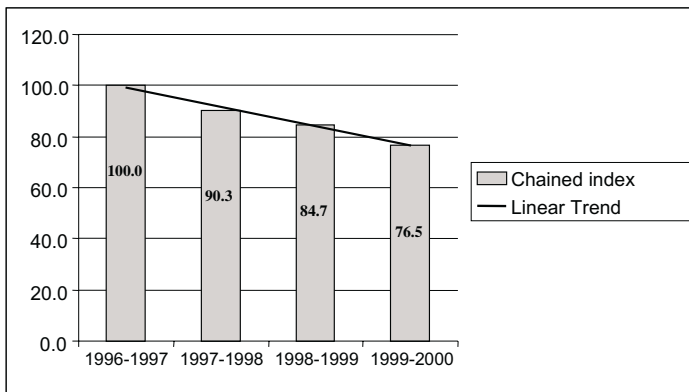
1996–97 to 1997–98

The change in the price of national long-distance calls consumed by residential consumers dominated the decrease in the price of the basket for national long-distance calls between 1996–97 and 1997–98. Between these years:

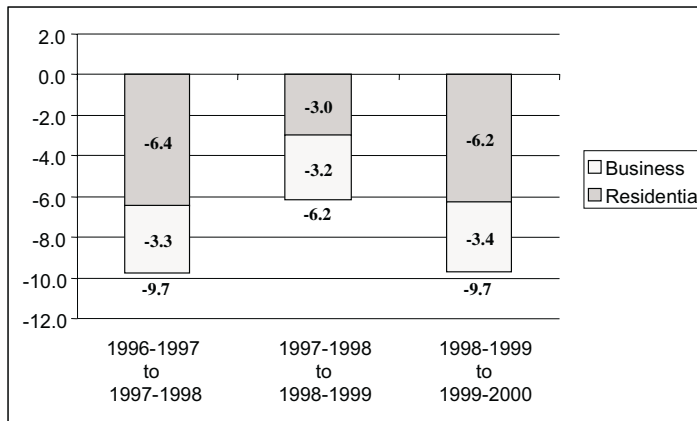
- the price of national long-distance calls consumed by residential consumers decreased by 10.8 per cent. This comprised 66 per cent of the decrease in the price of the national long-distance call basket, or 6.4 points of the 9.7 percentage point decrease in the price of the national long-distance call basket; and
- the price of national long-distance calls consumed by business consumers decreased by 8.1 per cent. This comprised 34 per cent of the decrease in the price of the national long-distance call basket, or 3.3 points of the 9.7 percentage point decrease in the price of the national long-distance call basket.

Figure 12. Change in the price of national long-distance calls, 1996–97 to 1999–2000

(a): Chained Index for national long distance calls



(b): Year on year percentage changes in the index for national long distance calls^a



a: The sum of the percentage points attributed to each major component of the index may not sum to the total percentage change due to rounding.

Source: CRU estimates based on data supplied by AAPT, C&W Optus, One.Tel and Telstra.

1997-98 to 1998-99

The contributions to the change in the price of national long-distance calls between 1997-98 and 1998-99 were evenly distributed. Between these years:

- the price of national long-distance calls made by residential consumers decreased by 4.8 per cent and this comprised 48.1 per cent of the decrease in the price of the national long-distance call basket, or 3 points of the 6.2 percentage point decrease in the price of the local call basket; and
- the price of national long-distance calls made by business consumers decreased by 8.2 per cent and this comprised 51.9 per cent of the decrease in the price of the national long-distance call basket, or 3.2 points of the 6.2 percentage point decrease in the price of the national long-distance call basket.

1998-99 to 1999-2000

The 9.7 per cent change in the price of national long-distance calls between 1998-99 and 1999-2000 was identical to the change between 1996-97 and 1997-98. Additionally, the contribution made by changes in the prices paid by residential and business consumers were almost identical.

Standard or list prices

Price structure and tariff zones

All the carriers provide long-distance calls that are timed and use a two-part pricing structure consisting of:

- a flagfall that is levied when the call is connected; and
- a variable charge that can vary by time of day, distance and call duration.

Telstra and C&W Optus had 20 and 24 different per minute charges in 1995 but had reduced these to 12 and three by 1999.

The main source of the reduced number of variable tariffs has been a reduction in the number of distance zones. Telstra and C&W Optus had effectively reduced the number of their distance zones to four and one respectively by 1999.

The carriers have also redefined their time zones so that by 1999 a smaller number of hours per week were subject to peak rates and a larger number of hours per week eligible for off-peak or economy rates (table 2).

Flagfall tariffs

The standard flagfall tariff for a national long-distance call made with:

- Telstra increased by 25 per cent to 15 cents in 1998 and 20 cents in June 2000;
- C&W Optus increased from 12 to 15 cents in 1998 (it remained unchanged in 1999 and 2000);
- AAPT increased from 12 to 15 cents in 1998 and 20 cents in 2000; and
- One.Tel increased from 12 to 15 cents during 1997–98 and remained unchanged during 1999–2000.

Variable tariffs

Telstra and C&W Optus increased some variable charges while decreasing others between 1995 and 1999. Telstra, for example, increased a large proportion of its timed charges across most time and distance zones in 1998, and to a lesser extent 1997, before reducing them significantly during 1999–2000.

Table 2. Weekly number of hours for time zones: national long-distance calls

Time zone	1996	1997	1998	1999	2000
Telstra					
Peak	50	50	30	30	–
Afternoon	–	–	30	30	–
Day	–	–	–	–	60
Night	16	10	–	–	–
Economy	102	108	108	108	108
C&W Optus^(a)					
Peak	55	50	50	50	50
Off -peak	52	56	70	70	70
Weekend	61	62	48	48	48
AAPT^(a)					
Peak	45	45	45	45	45
Night	69	69	69	69	69
Weekend	54	54	54	54	54
One.Tel					
Peak	50	50	50	50	50
Evening	20	20	20	20	20
Economy	98	98	98	98	98

Note (a): the zones listed for C&W Optus and AAPT are for residential consumers only.

Source: Telstra (various issues), Public Switched Telephone Service Standard Tariff, information provided by C&W Optus to the ACCC and publicly available ephemera.

C&W Optus increased most of its variable tariffs for calls made to destinations less than 100 kilometres away between 1996 and 1998 but decreased them for all calls made to more distant destinations. While this made some calls more expensive, the net effect was a decrease in the price of the majority of C&W Optus national long-distance calls. No significant change was made during 1999–2000.

Tariff data for One.Tel’s national long-distance calls are not available for 1996–97 and 1997–98. No changes were made to its tariffs for calls made from capital cities, the Gold Coast, Wollongong and Newcastle during 1998–99 and 1999–2000. There were, however, some significant reductions on tariffs for calls made from other cities during peak hours. The reductions were more significant for shorter calls, declining by 43 and 33 per cent for calls made to destinations between 25 and 50 kilometres, and 50 and 85 kilometres. Tariffs to

destinations between 85 and 745 kilometres and beyond 745 kilometres, decreased 7 and 13 per cent.

AAPT has used three variable tariffs for national long-distance calls made by residential consumers since 1997–98, weekend, weeknight and weekday. The tariffs were set at 9 cents, 15 cents and 25 cents per minute. The weekday tariff decreased to 22 cents per minute in 1998–99. All the variable tariffs remained unchanged during 1999–2000.

Discounts

The carriers offer discounts and promotions on national long-distance calls that may reduce the prices paid.

Telstra makes discounts available through its Flexi-Plans. It reduced the number of plans available for national long-distance calls in 1999 and no longer provide Flexi-Plan discounts to non-business customers with a basic telephone service. But Telstra continued to cap the price of weekday evening STD calls at a maximum of \$3, which it introduced in 1997, and extended the cap to weekend evenings in 2000.

The Long-distance Saver 4 Flexi-Plan is still available to business customers with more than one service, but the discounts applicable under this plan have been reduced. If expenditure on eligible calls was between \$500 and \$1000 in 1999–2000, a discount of 5 per cent was given. The applicable discount was 17 per cent in 1998. The highest possible discount available in 1999–2000 was 10 per cent and applied to eligible calls over \$450 000. The same discount was 23 per cent in 1998. Loyalty discounts still apply under this Flexi-Plan with up to an additional 3 per cent discount available to customers who have held the Long-distance Saver 4 Flexi-Plan for 24 months or more.

C&W Optus offered its business customers loyalty discounts in the form of rebates on the annual cost of their national long-distance phone bill in 1999 and 2000. If a customer remained with C&W Optus for one year, for example, they receive a rebate of 5 per cent on their long-distance bill for the full year. The rebate increases to 8 and 10 per cent after two and three years. C&W Optus also provides discounts to small businesses if they combine their Telstra local call and C&W Optus long-distance bills. C&W Optus introduced their 'Freetime' plan during 1999–2000, which capped the cost of a national long-distance call of up to three hours duration made at any time to \$3. Any national long-distance call made between 7 p.m. and midnight Monday to Friday attracted a maximum charge of \$3 before the introduction of 'Freetime'.

AAPT capped the price of national long-distance calls made to anywhere in Australia between 6 p.m. and midnight on weeknights at \$3 for all Smartchat customers in October 1997. The cap was reduced to \$1.99 in 1999 and to \$1.98, including the GST, in 2000.

One.Tel capped calls made to major cities between 6 and 10 p.m. on weeknights at \$1.99 during 1998–99 and 1999–2000. A 9 cent economy rate was introduced for calls made to the capital cities, the Gold Coast, Newcastle and Wollongong between 10 p.m. to 8 a.m. on any

day during 1997–98. This discount was restricted to calls made between 10 p.m. and 8 a.m. on weekends only in 1999–2000.

International calls

Change in prices paid

Overview: 1996–97 to 1999–2000

The price of international calls decreased by 53 per cent between 1996–97 and 1999–2000. The price decreased at a significant and increasing rate over the analysis period. The rate of decrease was 14.1 per cent between 1996–97 and 1997–98 and this increased to 23.9 and 28.1 per cent between 1997–98 and 1998–99, and 1998–99 and 1999–2000 (figure 13).

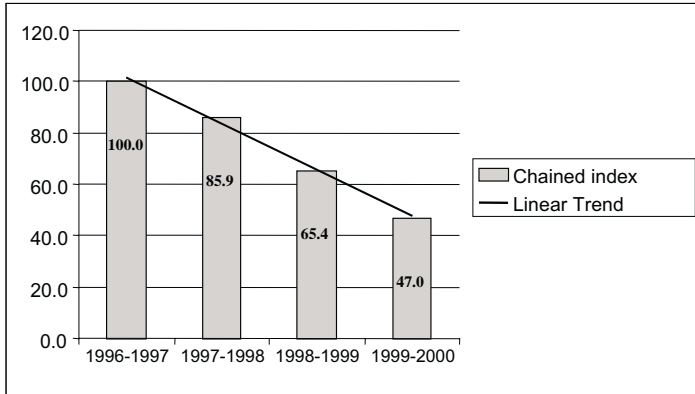
1996–97 to 1997–98

The change in the price of international calls consumed by residential consumers dominated the decrease in the price of the international call basket between 1996–97 and 1997–98. Between these years:

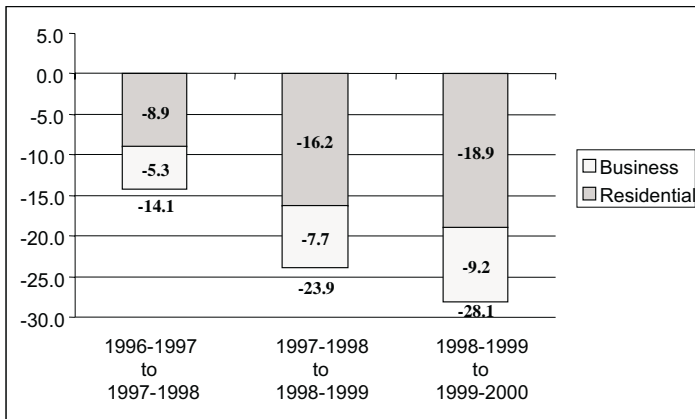
- the price of international calls consumed by residential consumers decreased by 12.3 per cent and this comprised 62.8 per cent of the decrease in the price of the international call basket, or 8.9 points of the 14.1 percentage point decrease in the price of the international call basket; and
- the price of international calls consumed by business consumers decreased by 18.6 per cent and this comprised 37.2 per cent of the decrease in the price of the international call basket, or 5.3 points of the 14.1 percentage point decrease in the price of the international call basket.

Figure 13. Change in the price of international calls, 1996–97 to 1999–2000

(a): Chained Index for international calls



(b): Year on year percentage changes in the index for international calls^a



a: The sum of the percentage points attributed to each major component of the index may not sum to the total percentage change due to rounding.

Source: CRU estimates based on data supplied by AAPT, C&W Optus, One.Tel and Telstra.

1997–98 to 1998–99

As with the previous annual change in price, the change in the price of international calls consumed by residential consumers dominated the decrease in the price of the international call basket between 1997–98 and 1998–99. Between these years:

- the price of international calls consumed by residential consumers decreased by 23.7 per cent and this comprised 67.8 per cent of the decrease in the price of the international call basket, or 16.2 points of the 23.9 percentage point decrease in the price of the international call basket; and
- the price of international calls consumed by business consumers decreased by 24.3 per cent and this comprised 32.2 per cent of the decrease in the price of the international call basket, or 7.7 points of the 23.9 percentage point decrease in the price of the international call basket.

1998–99 to 1999–2000

As with the two previous annual changes in price, the change in the price of international calls consumed by residential consumers dominated the decrease in the price of the international call basket between 1998–99 and 1999–2000. Between these years:

- the price of international calls consumed by residential consumers decreased by 27.5 per cent and this comprised 67.3 per cent of the decrease in the price of the international call basket, or 18.9 points of the 28.1 percentage point decrease in the price of the international call basket; and
- the price of international calls consumed by business consumers decreased by 29.6 per cent and this comprised 32.7 per cent of the decrease in the price of the international call basket, or 9.2 points of the 28.1 percentage point decrease in the price of the international call basket.

Standard or list prices

Price structure and tariff zones

The carriers provide international calls that are timed and use a two-part pricing structure consisting of:

- a flagfall that is levied when the call is connected; and
- a variable tariff that can vary by country, time of day and call duration.

The carriers varied the number of hours a week subject to peak and off-peak charges between 1996 and 2000. Telstra ceased charging different rates for international calls made at different times of the day and introduced an ‘Everyday rate’ for each destination in 1999. C&W Optus also introduced a similar pricing structure in 1999, which reduced significantly the price of their international calls (table 3).

Flagfall tariffs

The standard flagfall tariff for international calls made with:

- Telstra increased by 25 per cent to 15 cents for all customers in 1998 and remained unchanged in 1999. The tariff increased to 20 and 17 cents for residential and business customers during 1999–2000;
- C&W Optus increased from 12 to 15 cents in 1998 and remained unchanged during 1999–2000;
- AAPT increased from 12 to 15 cents during 1998 and 20 cents in 2000; and
- One.Tel increased from 12 to 15 cents during 1998–99 and remained unchanged during 1999–2000.

Variable tariffs

Peak and weekend variable tariffs decreased by an average of around 60 and 43 per cent with the introduction of Telstra's 'Everyday' rate during 1998–99. All tariffs decreased but the largest decreases occurred for calls to the United States, Greece and New Zealand where the tariffs decreased by 70, 66, and 65 per cent. The smallest decreases occurred for calls to Vietnam, India and Papua New Guinea where tariffs decreased by 28, 35 and 34 per cent. There were no further changes during 1999–2000.

C&W Optus' introduced 'Weekday' and 'Weekend' tariffs during 1999–2000. 'Weekday' and 'Weekend' tariffs decreased by an average of around 29 and 8 per cent. All tariffs decreased except for weekend calls to Indonesia and Vietnam, which did not change. The largest decreases occurred for calls to Greece, China and South Korea with tariffs declining by an average of around 31, 28 and 28 per cent. The smallest decreases occurred for calls to Indonesia, Papua New Guinea and Vietnam with tariffs declining by an average of around 4, 7 and 8 per cent.

Table 3. Hours per week subject to peak and other rates for international calls

Tariff	1996	1997	1998	1999	2000
Telstra					
Peak	56	50	50	–	–
Off-peak	112	118	70	–	–
Weekend	–	–	48	–	–
Everyday	–	–	–	168	168
C&W Optus					
Peak	45	45	50	–	–
Off-peak	123	123	70	–	–
Weekday	–	–	–	120	120
Weekend	–	–	48	48	48
One.Tel					
Flat	168	168	168	168	168
AAPT					
Peak	45	–	–	–	–
Off-peak	123	–	–	–	–
Flat	–	168	168	168	168

Source: Telstra (various issues), Public Switched Telephone Service Standard Tariff, information provided by C&W Optus to the ACCC and publicly available ephemera.

AAPT consolidated its two-tariff structures into single flat tariffs during 1998–99. The new price structures reduced the tariffs for calls made to New Zealand, Ireland, the UK and USA by around 17 per cent, and Hong Kong and Greece by 22 and 11 per cent. AAPT reduced its tariffs to these countries by between 27 and 43 per cent during 1999–2000.

One.Tel reduced significantly its variable tariffs during 1998–99. Tariffs for calls made to Canada, New Zealand, the UK and USA decreased by around 27 per cent. One.Tel reduced its tariffs to these destinations by a further 35 per cent during 1999–2000.

Discounts

Telstra offers its customers who make international calls of above average length the chance to purchase 30-minute blocks of time at concession rates. Each call destination country has its own rate.

C&W Optus offered ‘One Country Saver’ during 1998–99, which offered customers a discount of 40 per cent on calls made to a pre-selected country. ‘Optus Free Time’, replaced ‘One Country Saver’ during 1999–2000 and capped the price of calls that lasted up to three hours.

AAPT capped the price of calls made by Smartchat MAX customers between November 1999 and April 2000. Calls to the United Kingdom, the United States and New Zealand, for example, were capped at \$8 per day.

One.Tel does not appear to offer discount plans for international calls.

Calls from fixed to mobile services

Change in prices paid

Overview: 1996–97 to 1999–2000

The price of calls from fixed to mobile services decreased by 7.9 per cent between 1996–97 and 1999–2000. The price increased by 5.9 per cent between 1996–97 and 1997–98 before it began a downward trend over the rest of the analysis period. It decreased by 5.3 and 8.1 per cent between 1997–98 and 1998–99, and 1998–99 and 1999–2000 (figure 14).

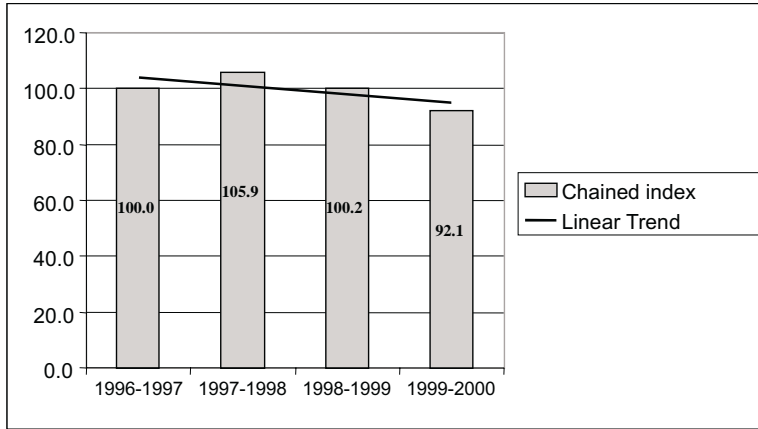
1996–97 to 1997–98

The change in the price of calls from fixed to mobile services consumed by residential and business consumers contributed evenly to the increase in the price of the basket for calls from fixed to mobile services between 1996–97 and 1997–98. Between these years:

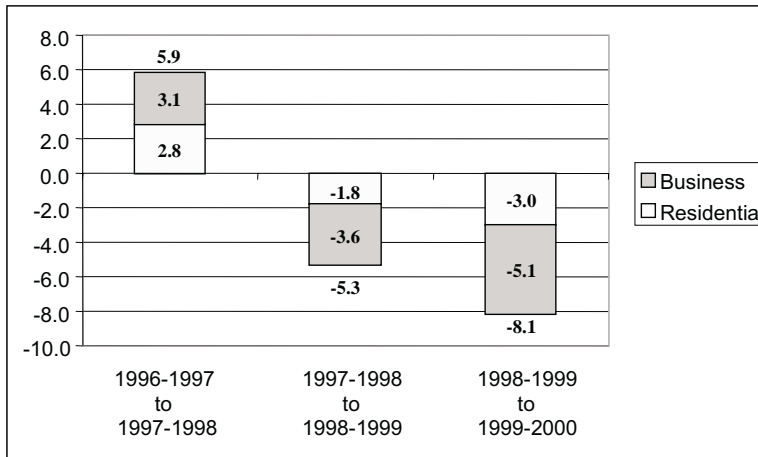
- the price of calls from fixed to mobile services consumed by residential consumers increased by 6.4 per cent and this comprised 48 per cent of the increase in the price of the basket for calls from fixed to mobile services, or 2.8 points of the 5.9 percentage point increase in the price of the basket for calls from fixed to mobile services; and
- the price of calls from fixed to mobile services consumed by business consumers increased by 5.5 per cent and this comprised 52 per cent of the increase in the price of the basket for calls from fixed to mobile services, or 3.1 points of the 5.9 percentage point increase in the price of the basket for calls from fixed to mobile services.

Figure 14. Change in the price of calls from fixed to mobile services, 1996–97 to 1999–2000

(a): Chained Index for calls from fixed to mobile services



(b): Year on year percentage changes in the index for calls from fixed to mobile services^a



a: The sum of the percentage points attributed to each major component of the index may not sum to the total percentage change due to rounding.

Source: CRU estimates based on data supplied by AAPT, C&W Optus, One.Tel and Telstra.

1997–98 to 1998–99

The change in the price of calls from fixed to mobile services consumed by business consumers contributed most to the decrease in the price of the basket for calls from fixed to mobile services between 1997–98 and 1998–99. Between these years:

- the price of calls from fixed to mobile services consumed by residential consumers decreased by 4.4 per cent and this comprised 33 per cent of the decrease in the price of the basket for calls from fixed to mobile services, or 1.8 points of the 5.3 percentage point decrease in the price of the basket for calls from fixed to mobile services; and
- the price of calls from fixed to mobile services consumed by business consumers decreased by 5.9 per cent and this comprised 67 per cent of the decrease in the price of the basket for calls from fixed to mobile services, or 3.6 points of the 5.3 percentage point decrease in the price of the basket for calls from fixed to mobile services.

1998–99 to 1999–2000

The change in the price of calls from fixed to mobile services consumed by business consumers contributed most to the decrease in the price of calls made from fixed to mobile services between 1998–99 and 1999–2000. Between these years:

- the price of calls from fixed to mobile services consumed by residential consumers decreased by 7.6 per cent and this comprised 37 per cent of the decrease in the price of the basket for calls from fixed to mobile services, or 3 points of the 8.1 percentage point decrease in the price of the basket for calls from fixed to mobile services; and
- the price of calls from fixed to mobile services consumed by business consumers decreased by 8.5 per cent and this comprised 63 per cent of the decrease in the price of the basket for calls from fixed to mobile services, or 5.1 points of the 8.1 percentage point decrease in the price of the basket for calls from fixed to mobile services.

Standard or list prices

Price structure and unit tariffs

Calls made from a Telstra fixed-line service to cellular mobile phone were charged at a fixed rate of 25 cents per chargeable period between 1995 and 1998. The chargeable period, measured in seconds, varied with the time of day, distance (for calls to Telstra mobiles only), and the network being called. The only change of note over this period was when Telstra increased the number of seconds per fixed charge to call a C&W Optus mobile in 1997, before reducing them again in 1998.

In the first half of 1999 Telstra introduced a two-part pricing structure consisting of:

- a flagfall of 15 cents per call; and
- a per second tariff that varied with the time of day, distance (for Telstra mobiles only) and the network being called.

Telstra increased the variable tariff for near calls to its own GSM mobiles by around 3 per cent in 1999–2000. At the same time, however, the variable tariffs were reduced for ‘far’ calls made during peak and off-peak hours by 32 and 20 per cent.

C&W Optus has a two-part price structure for calls made from a fixed to mobile service that consists of:

- a flagfall tariff levied on each call; and
- a per second charge that varies by the time of day only (peak, off-peak or weekend).

The per second charges have not changed since C&W Optus entered the local call market in 1996. The flagfall was increased from 10 to 15 cents per call in 1998.

One.Tel has a two-part price structure for calls made from a fixed to mobile service that consists of:

- a flagfall tariff of 15 cents levied on each call; and
- a per 30 second charge that varies by the time of day only (peak, off-peak) and destination network.

AAPT has a two-part price structure for calls made from a fixed to mobile service that consists of:

- a flagfall tariff of 15 cents levied on each call; and
- a single variable tariff that increased from 15 to 20 cents per minute in June 2000.

8. Indexes for services consumed inside and outside of capital cities

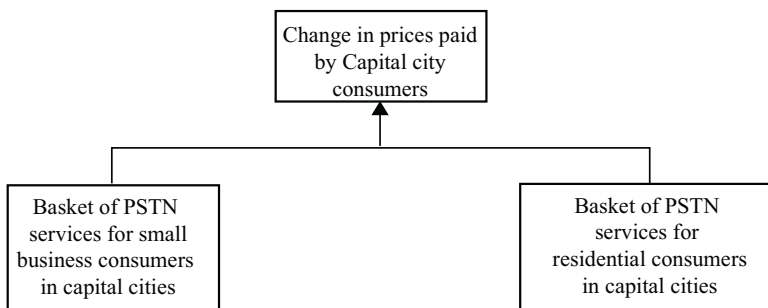
The indexes for baskets of services consumed by consumers living inside and outside of capital cities show changes in the prices of baskets of PSTN services across small business and residential consumers in these locations. These indexes do not include other business consumers due to lack of data.

It is important to note that a price index shows the rate of change in prices but says nothing about price levels. Consequently, the indexes for consumers inside and outside of capital cities may not be used to compare the price levels faced by the two groups.

The capital and non-capital indexes are constructed from sample billing data because the population data used to construct all the previous indexes presented in this report could not be disaggregated by region and customer type. The capital and non-capital indexes are therefore subject to the variations and errors normally associated with sample data. Nevertheless, they do provide an indication of the changes in price experienced by consumers living inside and outside of capital cities.

Index for PSTN services consumed inside of capital cities

Figure 15. Index for PSTN services consumed by capital city consumers



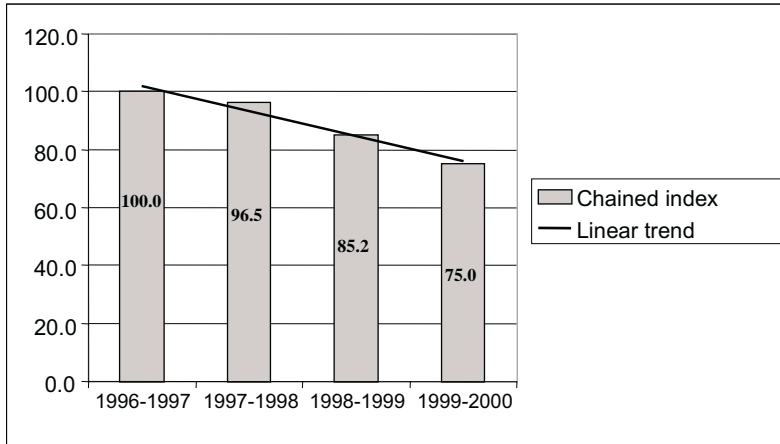
Change in prices paid

Overview: 1996–97 to 1999–2000

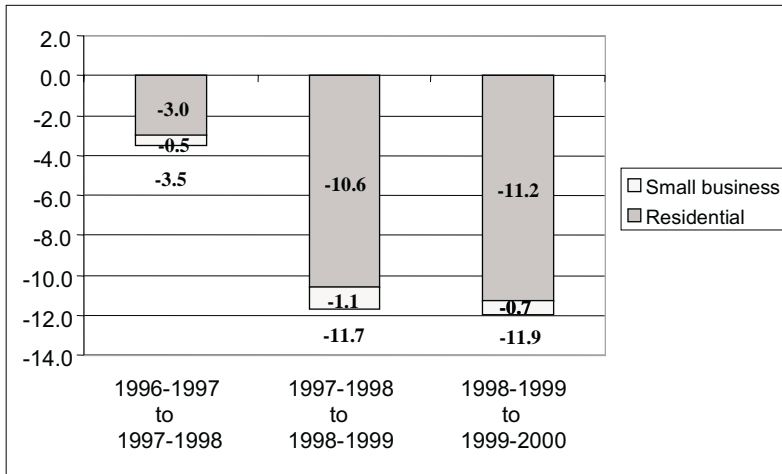
The price of the PSTN capital basket decreased by 25 per cent between 1996–97 and 1999–2000. The decrease in price was 3.5 per cent between 1996–97 and 1997–98 and accelerated to 11.7 and 11.9 per cent between 1997–98 and 1998–99, and 1998–99 and 1999–2000 (figure 16).

Figure 16. Change in price of PSTN services consumed by capital city consumers

(a): Chained Index for capital city basket



(b): Year on year percentage changes in the index for the capital city basket^a



a: The sum of the percentage points attributed to each major component of the index may not sum to the total percentage change due to rounding.

Source: CRU estimates based on data supplied by AAPT, C&W Optus, One.Tel and Telstra.

1996–97 to 1997–98

Changes in the price of the residential capital basket made the largest contribution to the decrease in the price of the PSTN capital basket between 1996–97 and 1997–98. Between these years:

- the price of the residential capital basket decreased by 3.3 per cent and this comprised 84.6 per cent of the decrease in the all PSTN capital basket, or 3 points of the 3.5 percentage point decrease in the price of the PSTN capital basket; and
- the price of the small business capital basket decreased by 5.1 per cent and this comprised 15.4 per cent of the decrease in the PSTN capital basket, or 0.5 points of the 3.5 percentage point decrease in the price of the PSTN capital basket.

The individual services that made the largest contributions to the change in the price of the PSTN capital basket between 1996–97 and 1997–98 were:¹⁸

- international calls made by residential consumers in capital cities (the price of these calls decreased by 13.2 per cent and this comprised 63.5 per cent of the decrease in the price of the PSTN capital basket);
- local calls made by residential consumers in capital cities (the price of these calls decreased by 1.5 per cent and this comprised 17.5 per cent of the decrease in the price of the PSTN capital basket); and
- international calls made by small business consumers in capital cities (the price of these calls decreased by 23.3 per cent and this comprised 9.6 per cent of the decrease in the price of the PSTN capital basket).¹⁹

1997–98 to 1998–99

Changes in the price of the residential capital basket made the largest contribution to the decrease in the price of the PSTN capital basket between 1997–98 and 1998–99. Between these years:

- the price of the residential capital basket decreased by 11.9 per cent and this comprised 90.7 per cent of the decrease in the PSTN capital basket, or 10.6 points of the 11.7 percentage point decrease in the price of the PSTN capital basket; and
- the price of the small business capital basket decreased by 9.9 per cent and this comprised 9.3 per cent of the decrease in the PSTN capital basket, or 1.1 points of the 11.7 percentage point decrease in the price of the PSTN capital basket.

18 Please see footnote 10.

19 The contributions of other services to the change in the price of the basket between 1996–97 and 1997–98 may be derived from the data in table A3.25. Data for deriving contributions to the changes in price between 1997–98 and 1998–99, and 1998–99 and 1999–2000 is listed in tables A3.26 and A3.27. The three largest contributions for these years are listed in the following passages.

The residential capital basket made the dominant contribution to the decrease in the price of the PSTN capital basket because its weight in the PSTN capital basket was 89 per cent in 1997–98. Additionally, the decrease in its price was 20 per cent larger than that for the small business capital basket (table A3.26).

The individual services that made the largest contributions to the change in the price of the PSTN capital basket between 1997–98 and 1998–99 were:

- international calls made by residential consumers in capital cities (the price of these calls decreased by 37.9 per cent and this comprised 53.7 per cent of the decrease in the price of the PSTN capital basket);
- national long-distance calls made by residential consumers in capital cities (the price of these calls decreased by 10.4 per cent and this comprised 20.3 per cent of the decrease in the price of the PSTN capital basket); and
- local calls made by residential consumers in capital cities (the price of these calls decreased by 4.1 per cent and this comprised 13 per cent of the decrease in the price of the PSTN capital basket).

1998–99 to 1999–2000

Changes in the price of the residential capital basket made the largest contribution to the decrease in the price of the PSTN capital basket between 1998–99 and 1999–2000. Between these years:

- the price of the residential capital basket decreased by 12.3 per cent and this comprised 94 per cent of the decrease in the PSTN capital basket, or 11.2 points of the 11.9 percentage point decrease in the price of the PSTN capital basket; and
- the price of the small business capital basket decreased by 7.9 per cent and this comprised 6 per cent of the decrease in the PSTN capital basket, or 0.7 points of the 11.9 percentage point decrease in the price of the PSTN capital basket.

The residential capital basket made the dominant contribution to the decrease in the price of the PSTN capital basket because its weight in the PSTN capital basket was 91 per cent in 1998–99. Additionally, the decrease in its price was 55.7 per cent larger than that for the small business capital basket (table A3.26).

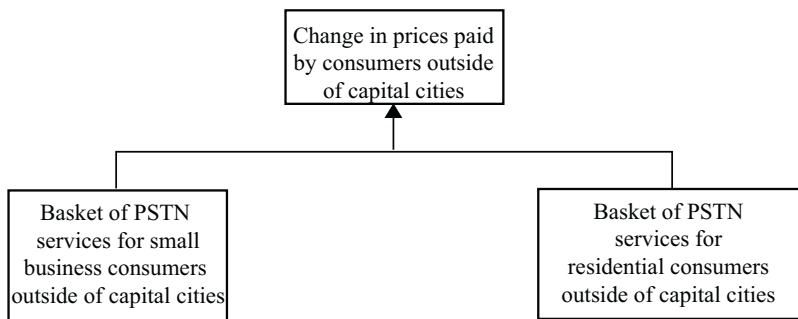
The individual services that made the largest contributions to the change in the price of the PSTN capital basket between 1998–99 and 1999–2000 were:

- local calls made by residential consumers in capital cities (the price of these calls decreased by 18.7 per cent and this comprised 62.6 per cent of the decrease in the price of the PSTN capital basket);
- international calls made by residential consumers in capital cities (the price of these calls decreased by 25.1 per cent and this comprised 27.2 per cent of the decrease in the price of the PSTN capital basket); and

-
- local calls made by small business consumers in capital cities (the price of these calls decreased by 17.3 per cent and this comprised 4.3 per cent of the decrease in the price of the PSTN capital basket).

Index for PSTN services consumed outside of capital cities

Figure 17. Index for services consumed by consumers outside of capital cities



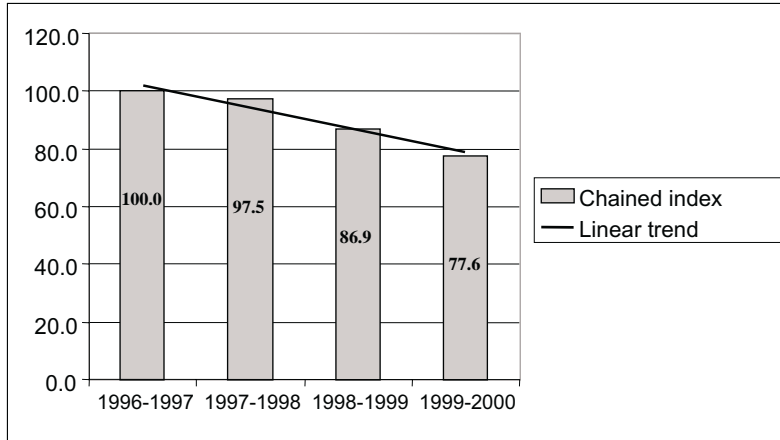
Change in prices paid

Overview: 1996–97 to 1999–2000

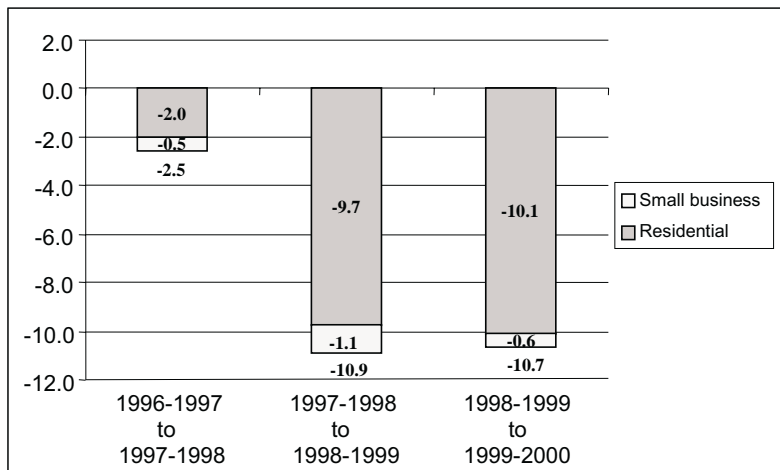
The price of the PSTN non-capital basket decreased by 22.4 per cent between 1996–97 and 1999–2000. The decrease in price was 2.5 per cent between 1996–97 and 1997–98 and accelerated to 10.9 and 10.7 per cent between 1997–98 and 1998–99, and 1998–99 and 1999–2000 (figure 18).

Figure 18. Change in price of PSTN services consumed by consumers outside of capital cities

(a): Chained Index for non-capital basket



(b): Year on year percentage changes in the index for the non-capital basket^a



a: The sum of the percentage points attributed to each major component of the index may not sum to the total percentage change due to rounding.

Source: CRU estimates based on data supplied by AAPT, C&W Optus, One.Tel and Telstra.

1996–97 to 1997–98

Changes in the price of the residential non-capital basket made the largest contribution to the decrease in the price of the PSTN non-capital basket between 1996–97 and 1997–98. Between these years:

- the price of the residential non-capital basket decreased by 2.3 per cent and this comprised 80.7 per cent of the decrease in the PSTN capital basket, or 2 points of the 2.5 percentage point decrease in the price of the PSTN non-capital basket; and
- the price of the small business non-capital basket decreased by 4.2 per cent and this comprised 19.3 per cent of the decrease in the PSTN non-capital basket, or 0.5 points of the 2.5 percentage point decrease in the price of the PSTN non-capital basket.

The residential non-capital basket made the dominant contribution to the decrease in the price of the PSTN non-capital basket despite its price decreasing by 55 per cent less than the decrease in the price of the small business non-capital basket. This occurred because the weight in the PSTN non-capital basket of the residential non-capital basket was 88.3 per cent in 1996–97 (table A3.28).

The individual services that made the largest contributions to the change in the price of the PSTN non-capital basket between 1996–97 and 1997–98 were:²⁰

- international calls made by residential consumers from outside capital cities (the price of these calls decreased by 15.4 per cent and this comprised 43.3 per cent of the decrease in the price of the PSTN non-capital basket);
- national long-distance calls made by residential consumers from outside capital cities (the price of these calls decreased by 2.2 per cent and this comprised 34.8 per cent of the decrease in the price of the PSTN non-capital basket); and
- national long-distance calls made by small business consumers from outside capital cities (the price of these calls decreased by 6 per cent and this comprised 14.8 per cent of the decrease in the price of the PSTN capital basket).²¹

1997–98 to 1998–99

Changes in the price of the residential non-capital basket made the largest contribution to the decrease in the price of the PSTN non-capital basket between 1997–98 and 1998–99. Between these years:

- the price of the residential non-capital basket decreased by 11 per cent and this comprised 89.6 per cent of the decrease in the PSTN non-capital basket, or 9.7 points of the 10.9 percentage point decrease in the price of the PSTN non-capital basket; and

20 Please see footnote 10.

21 The contributions of other services to the change in the price of the basket between 1996–97 and 1997–98 may be derived from the data in table A3.28. Data for deriving contributions to the changes in price between 1997–98 and 1998–99, and 1998–99 and 1999–2000 are listed in tables A3.29 and A3.30. The three largest contributions for these years are listed in the following passages.

-
- the price of the small business non-capital basket decreased by 10 per cent and this comprised 10.4 per cent of the decrease in the PSTN non-capital basket, or 1.1 points of the 10.9 percentage point decrease in the price of the PSTN non-capital basket.

The residential non-capital basket made the dominant contribution to the decrease in the price of the PSTN non-capital basket because its weight in the PSTN non-capital basket was 88.7 per cent in 1997–98. Additionally, the decrease in its price was 10 per cent larger than that for the small business non-capital basket (table A3.29).

The individual services that made the largest contributions to the change in the price of the PSTN non-capital basket between 1997–98 and 1998–99 were:

- national long-distance calls made by residential consumers from outside capital cities (the price of these calls decreased by 12.8 per cent and this comprised 55.4 per cent of the decrease in the price of the PSTN non-capital basket);
- international calls made by residential consumers from outside capital cities (the price of these calls decreased by 32.3 per cent and this comprised 24 per cent of the decrease in the price of the PSTN non-capital basket); and
- local calls made by residential consumers from outside capital cities (the price of these calls decreased by 3.8 per cent and this comprised 8.3 per cent of the decrease in the price of the PSTN non-capital basket).

1998–99 to 1999–2000

Changes in the price of the residential non-capital basket made the largest contribution to the decrease in the price of the PSTN non-capital basket between 1998–99 and 1999–2000.

Between these years:

- the price of the residential non-capital basket decreased by 11.4 per cent and this comprised 94.6 per cent of the decrease in the PSTN non-capital basket, or 10.1 points of the 10.7 percentage point decrease in the price of the PSTN non-capital basket; and
- the price of the small business non-capital basket decreased by 4.8 per cent and this comprised 5.4 per cent of the decrease in the PSTN non-capital basket, or 0.6 points of the 10.7 percentage point decrease in the price of the PSTN capital basket.

The residential non-capital basket made the dominant contribution to the decrease in the price of the PSTN non-capital basket because its weight in the PSTN non-capital basket was 91.2 per cent in 1998–99. Additionally, the decrease in its price was more than three times larger than that for the small business non-capital basket (table A3.30).

The individual services that made the largest contributions to the change in the price of the PSTN non-capital basket between 1998–99 and 1999–2000 were:

- local calls made by residential consumers from outside capital cities (the price of these calls decreased by 23.7 per cent and this comprised 58.4 per cent of the decrease in the price of the PSTN non-capital basket);
- national long-distance calls made by residential consumers from outside capital cities (the price of these calls decreased by 5 per cent and this comprised 20.2 per cent of the decrease in the price of the PSTN non-capital basket); and
- international calls made by residential consumers from outside capital cities (the price of these calls decreased by 23.5 per cent and this comprised 13.6 per cent of the decrease in the price of the PSTN non-capital basket).

Appendix 1. Constructing the index model

The index model was constructed as two separate modules, an index for fixed-line services and another for mobile services. These two indexes were brought together to calculate the overall index.

The two-module approach was necessary because price data for mobile telephony had to be derived differently from that of the PSTN services. The nature of the analytical problem is explained in the mobile telephony section of this appendix.

The index for fixed-line services

The indexes for fixed-line services presented in this report have been produced by a chained Laspeyres index, which is an adaptation of the standard Laspeyres index.

The standard Laspeyres index

The standard Laspeyres index is a bi-lateral index that measures the proportional change in the price of a basket of services between a reference and base year. It tells us how much more or less the basket of services that is consumed in the base year would cost if consumers had to pay the prices that exist in the reference year. It is given by:

$$I_{(0,t)}^s = \frac{\sum_{i=1}^n q_{(i,0)} P_{(i,0)} \frac{P_{(i,t)}}{P_{(i,0)}}}{\sum_{i=1}^n q_{(i,0)} P_{(i,0)}} * 100$$
$$\frac{\sum_{i=1}^n q_{(i,0)} P_{(i,t)}}{\sum_{i=1}^n q_{(i,0)} P_{(i,0)}} * 100 \tag{Eq. A1.1}$$

where

$I_{(0,t)}^s$ = the standard index number for the change in prices between the base year and year t , the reference year;

$q_{(i,0)}$ = the quantity of service i consumed in the base year;

$P_{(i,0)}$ = the price of service i in the base year; and

$P_{(i,t)}$ = the price of service i in the year t , the reference year.

Thus, calculating the standard Laspeyres index reduces to finding the ratio of the ‘expenditure’ that would be required to purchase the base period basket at the reference period’s prices to the actual expenditure on the base period basket. The ratio is then multiplied by 100.

All we need to complete the above calculation is expenditure data from the base period and price data from the base and reference periods. As an example, consider a basket that contains two services, *AAA* and *BBB*, for which the value of an index in year 1 is calculated using the following steps.

- The actual expenditures in the base period are listed (table A1.1).
- The price data from both periods are used to calculate a price relative for each service.
 - In our example, a price relative is the price in year 1 divided by the price in the base year and it equals one plus the rate of change in the price of the service.
 - The prices of *AAA* and *BBB* increased by 10 and 25 per cent between the base year and year 1, giving price relatives of 1.10 and 1.25.
- The ‘expenditure’ on each service in year 1, the reference period, is calculated.
 - It is the base period expenditure multiplied by the price relative for each service (table A1.1: $150 \times 1.10 = 165.0$ for *AAA* and $200 \times 1.25 = 250.0$ for *BBB*).
- The value of the all service index in year 1 is calculated.
 - It is the ‘expenditure’ on all services in year 1 divided by the actual expenditure on all services in the base year (table A1.1: $100 \times 415.0 / 350.0 = 118.6$).

Table A1.1. Illustrative calculation of standard Laspeyres index

Service	Base period actual expenditure (\$m)	Price relative	Year 1 expenditure (\$m) ^a	Index value in year 1
AAA	150.0	1.10	165.0	
BBB	200.0	1.25	250.0	
All services	350.0		415.0	118.6

Note a: This 'expenditure' is the amount that would be required to purchase the base period basket at the prices that existed in year 1.

The value of an index is traditionally set at 100 in the base period. The method for each subsequent period is the same and the base year basket continues to be used to calculate the 'expenditures' for the reference year.

The continued use of the base year basket in the standard Laspeyres index creates an inherent bias in the measurement of changes in price. As a good or service becomes less expensive compared to others, consumers will tend to increase their consumption of it. Conversely, consumption of a good or service tends to decrease when it becomes comparatively more expensive than others. The standard Laspeyres index, however, cannot accommodate these changes in consumption. Consequently, the influence on the overall index of services that become comparatively more expensive will not decrease and the influence of those that become comparatively less expensive will not increase as they should.

The standard Laspeyres index is also unable to accommodate changes in consumption patterns due to changes in technology, services provided, tastes and so on. Telecommunications is a dynamic sector where rapid change is occurring in these areas and consumption patterns are changing continually. As with prices changing at different rates, this will cause the base period basket to become unrepresentative of consumer behaviour quickly and the index will not reflect accurately changes in prices paid. A chained Laspeyres index was used to overcome the inability of the standard index to cope with changes in consumption patterns.

A chained Laspeyres index

A chained Laspeyres index differs from the standard index in that the composition of the basket of goods is not fixed for several periods. The basket is re-weighted each year and the values of the index in the second and subsequent years are calculated without reference to the base year. Changes in consumption patterns are introduced each year and the baskets for which changes in price are calculated are more representative of consumption on average.

As has been mentioned, the chained Laspeyres index is an adaptation of the standard index. Indeed, in the first year after the base year, the standard index formula, Eq. A1.1, is used. In the second and subsequent years, the chained index is given by:

$$I_{(0,t+1)}^c = I_{(0,t)}^c * \frac{\sum_{i=1}^n q_{(i,t)} p_{(i,t+1)}}{\sum_{i=1}^n q_{(i,t)} p_{(i,t)}} \quad \text{Eq. A1.2}$$

$$= I_{(0,t)}^c * (1+r)_{(t,t+1)} \quad \text{Eq. A1.2}$$

where:

$I_{(0,t+1)}^c$ = the chained index number for the change in prices between the base year and the year $(t+1)$;

$I_{(0,t)}^c$ = the chained index number for the change in prices between the base year and the year t ;

$(1+r)_{(t,t+1)}$ = the prices growth factor, which is one plus the rate of change in prices between the years t and $(t+1)$;

$q_{(i,t)}$ = the quantity of service i consumed in the year t ;

$p_{(i,t)}$ = the price of service i in the year t ; and

$p_{(i,t+1)}$ = the price of service i in the year $(t+1)$.

Thus, calculating a chained index for the second and subsequent years after the base year reduces to calculating the prices growth factor for the years t and $(t+1)$ and multiplying it by the value of the index in the year t .

As has been mentioned, the index number for the first year after the base year is identical in a standard and chained index (table A1.2: chained index in year 1 = 118.6) and the value of an index is set to 100 in the base year.

Table A1.2. Calculating a chained Laspeyres index

Service	Calculation of prices growth factor: years 1 to 2				Chained index		
	Year 1 actual expend. (\$m)	Price relatives	Year 2 expend. (\$m) ^a	Prices growth factor	Base year	Year 1	Year 2
AAA	170.0	1.2	204.0				
BBB	245.0	1.1	269.5				
All services	415.0		473.5	1.14	100	118.6	135.3

Note a: This ‘expenditure’ is the amount that would be required to purchase the year 1 basket at prices that existed in year 2.

In the second year of a chained index, however, equation A1.2 is used in the following way.

- The actual expenditures in year 1 on the services are listed (table A1.2).
 - Readers will note that the actual expenditures for year 1 in table A1.2 differ from the expenditures for year 1 in table A1.1. This is because the expenditure for each service in year 1 is the amount consumers would have to spend on each service that they purchased in the base year if faced with the prices that exist in year 1 and the actual expenditure is the amount actually spent on a new basket of services. The actual expenditures tracked by the chain-linked index take into account changes in consumption patterns, while the standard Laspeyres index uses the base year’s consumption patterns.
- The price data from years 1 and 2 are used to calculate a price relative for each service.
 - In the above example, a price relative is the price of a service in year 2 divided by the price in year 1 and it equals one plus the rate of change in the price.
 - The prices of AAA and BBB increased by 20 and 10 per cent between years 1 and 2, giving price relatives of 1.2 and 1.1.
- The expenditures for year 2 are calculated.
 - It is actual expenditure in year 1 multiplied by the price relative for each service (table A1.2: $170 \times 1.2 = 204.0$ for AAA and $245 \times 1.1 = 269.5$ for BBB).
- Calculate the prices growth factor between years 1 and 2 for the basket.
 - The prices growth factor between years 1 and 2 is the expenditure on all services in year 2 divided by the actual expenditure in year 1 (table A1.2: $473.5/415.0 = 1.14$).
- Thus the price of the services consumed has increased by 14 per cent between years 1 and 2.
- Calculate the value of the chained index in year 2.
 - It is the prices growth factor multiplied by the value of the chained index in year 1 (table A1.2: $118.6 \times 1.14 = 135.3$).

The method for each subsequent period is the same and, importantly, the year that determines the composition of the basket used to calculate the prices growth factor is moved forward with each calculation. Thus, in the calculation of the chained index for year 3, the prices growth factor will use a basket determined by the actual expenditures in year 2 and so on.

Alternatively, the calculation of the chained index may be viewed as a two-stage process. In the first stage, a standard mini-index is calculated for years 1 and 2 with year 1 as the base year in that calculation. This gives 100 and 114 as the index numbers in the mini-index (table A1.3).

Table A1.3. Calculating a chained Laspeyres index in two stages

Year	Initial chained index	Mini-index	New chained index
0=base year of chained index	100		100
1	118.6	100	118.6
2		114	135.3

In the second stage, the mini-index is linked to the chained index to give a continuous series with one base year. This is achieved by changing the base year of the mini-index to year 0, the base year of the chained index. This is achieved by multiplying each value of the mini-index by the most recent value of the chained index divided by its value in its base year. The values of the continuous chained index in years 1 and 2 are thus 118.6 ($[118.6/100]*100$) and 135.3 ($[118.6/100]*114$).

Data on prices paid

As has been mentioned in the main body of the report, yield data have been used to derive the necessary price data for the fixed-line services included in the index. This provides an estimate of the average price paid for a unit of a telecommunications service consumed in a year. In the market for national long-distance calls, for example, it provides an estimate of the average price paid for a call minute during a year.

Yield data were preferred to the standard or list prices used in previous reports because standard prices do not capture the effects of discounts and short-term specials. This was viewed as a serious deficiency in a market where discount plans and short-term specials are common.

The use of yield data has been rejected in some previous studies into telecommunications prices. The Productivity Commission (1999a), for example, rejected the use of yield data for two reasons. First, they argued that there was a theoretical difficulty because variations in usage patterns would cause yields to differ between two markets in which unit prices are identical. The Commission compared prices across countries at a point in time but the same argument may apply to yields differing between two periods in which unit prices are the same.

The theoretical difficulty with yields is most relevant to services with multiple unit tariffs. The price structure of national long-distance calls, for example, contains multiple time and distance zones in which different per minute tariffs apply. Consider the following illustrative example in which the price structure of service *ZZZ* consists of tariff zones A and B, each with a different unit tariff (table A1.4).

Table A1.4. Yields and services with multiple unit tariffs

	Data for the year <i>t</i>				Data for the year (<i>t+1</i>)			
	Call minutes	Unit tariff (\$/min)	Expend. (\$)	Yield (\$/min)	Call minutes	Unit tariff (\$/min)	Expend. (\$)	Yield (\$/min)
Tariff zone A	100	1.00	100		200	1.00	200	
Tariff zone B	200	2.00	400		100	2.00	200	
Service <i>ZZZ</i>	300		500	1.66	300		400	1.33

Between the years *t* and (*t+1*), the number of call minutes made in zone A increase by 100 per cent and those in zone B decrease by 100 per cent. The yield for service *ZZZ* decreases by around 20 per cent between the years *t* and (*t+1*) because of the large change in the pattern of consumption, even though customers have not experienced any increase in the unit tariffs. By contrast, consider service *ZZZ* as a basket of two services, calls made in zones A and B. An index number calculation would indicate correctly that the price paid on average for service *ZZZ* remained unchanged between the years *t* and (*t+1*) because the price relatives of all the services in the basket would be 1.

The solution to the theoretical difficulty with using yield data would be to regard each tariff category as an individual service, as in the previous paragraph. However, the data required for such a model were not readily available. As it was, the archiving practices of the carriers meant we could not get a full data set aggregated across the tariff categories but disaggregated across customer types, as required by the model used for this report. The choice in the end, so that the changes in price faced by different types of customers could be analysed, was:

- accepting the difficulty of using yields in some instances and using an estimate of prices paid after discounts; or
- using standard prices, which make no allowance for discounts.

Using yields was judged the best option.

The second reason the Productivity Commission rejected using yields was the limited availability of data across all the countries in its study. In the present context, where Australian data only is required, the aggregated revenue and quantity data that is required is mostly available.

The index for mobile services²²

Analysing changes in price of mobile telephony is not a straightforward exercise because of the methods by which it is marketed and sold. Consequently, a different approach to that adopted for the PSTN services was required.

The price of mobile telephony: the analytical problem

To use mobile telephony, consumers require a mobile handset, and connection and ongoing access to a mobile network. Once connected, consumers may use a range of services that are subject to various charges.

The difficulty with mobile telephony is that all the prerequisites for using it, like the handset and access to a network and the individual services, are sold jointly as bundles through a wide range of user plans. Furthermore, consumers determine the unit price of each component jointly when signing onto a plan and are able to trade off high charges for calls and other services against low up-front charges for handsets and access to a network. Consumers choose plans to suit their usage patterns and ability or willingness to pay higher up-front charges.

The nature of the plans means that there is a high degree of cross subsidisation between the individual components, particularly for plans where the up-front charges for handsets are zero or close to it. Even the most basic handset may cost several hundred dollars when purchased individually and these costs have to be recouped when the up-front charge is close to zero. This is done over the life of the plan through higher charges for calls and other services.

The degree of cross subsidisation in many of the plans means it is incorrect to analyse changes in the overall price of mobile telephony by simply analysing the unit charge for an individual service. Indeed, such an approach could give a seriously misleading picture of the overall cost of mobile telephony. It ignores, for example, the effect on price of new plans with features like, free minutes, new services and better handsets. Making international comparisons also becomes problematic. In Finland, for example, consumers pay the full cost of their handset up front and the carriers do not have to recoup this elsewhere. They can thus offer lower per minute charges for calls. Simply comparing the per minute charges for calls in Australia and Finland would not be an accurate indicator of the overall relative price of mobile telephony in the two countries.

The CRU approach

The CRU's approach to estimating the price of mobile telephony treats mobile telephony as a bundle of services and measures the minimum price consumers might pay for them. The CRU considered two alternatives to implementing the approach.

The first alternative considered was to use sample bill data provided by the carriers to derive usage patterns for five user groups. The data could be divided into quintiles by bill expenditure

22 The section on mobile telephony draws heavily on Eve Osioy and Peter Collins (2000).

to do this. A price index, weighted by patterns of use, may then be calculated using the aggregate revenue values from one period and changes in price. This approach would have been the simplest and most straightforward method but was not used by the CRU because:

- only limited sample bill data were available and only for the current year making it impossible to calculate an index for the previous three to four years (as some carriers in the study were not able to provide sample data in the time required it would not have been possible to estimate price movements for these carriers);
- this method also could not incorporate the cost of handsets to consumers over the past three to four years as these costs are not included on bill records; and
- it is unable to deal with the cost of prepaid mobile services as bills are not issued for these services.

The second alternative considered was to use available sample bill data, divide it into quintiles by bill expenditure, as in the first alternative, but combine it with other information to determine spending patterns or bundles for a range of consumers. These bundles, plus the handsets, can then be priced using the least cost mobile plan for each bundle. This was the basis of the approach used by the CRU in this study.

As a starting point, the CRU considered work completed by National Economic Research Associates (NERA). OFTEL commissioned NERA to develop and run a model that identifies trends in the pricing of mobile telephony in the UK (NERA, 1999, p. 1). The general approach of that work was to develop numerous consumer profiles using surveys and match the least cost plan from each carrier to each of the consumer profiles. This determined the cost per month for a particular profile. A weighted average cost per month was then calculated for each carrier. This cost was divided by the cost in the base period and an index constructed. All the carrier indexes were weighted together to calculate an index for the whole market (NERA, 1999, p. 3).

What prices to measure?

The prices of post-paid services supplied on the GSM networks were measured for this study. Insufficient data were available to include CDMA and pre-paid services but these could be added to the index in subsequent years. The prices paid would ideally be measured separately for residential and business consumers. These two groups have different patterns of consumption and expenditure. Thus the plans they choose and the prices they pay for mobile telephony could differ. The CRU initially proposed to cover business and non-business consumers separately but the available data did not permit this.

In recent times telecommunications services in rural and regional areas have emerged as an important issue for Government. As a result, the possibility of pricing mobile services based on metropolitan and non-metropolitan breakdowns was examined. Again, the available data did not allow us to identify mobile users who are uniquely located in either a metropolitan or non-metropolitan area. As we plan to introduce CDMA services into the index, sub-indexes for CDMA and GSM services may provide a proxy measure of regional and metropolitan prices. It

will not be an effective proxy measure, however, if CDMA services are adopted widely by metropolitan users and GSM services by regional users.

Defining the bundles

Determining the components of mobile telephony bundles purchased by consumers and the importance of each of the components in consumers' overall spending pattern was important. One approach to this task would be to conduct a survey of consumers who purchase mobile phone services to determine the consumption patterns of, and expenditure on, these services. As mentioned, this is the approach NERA took in the work they conducted for OFTEL.

An alternative approach to measuring consumption and expenditure patterns for mobile telephony is to sample actual mobile phone bill records. The bill records could be obtained directly from the carriers included in the study. This is the approach the CRU wanted to take in this study but the limited availability of billing data in the time available meant alternative data had to be used.

The CRU developed a proxy set of bundles that were used to estimate the price of mobile telephony. The bundles were constructed using a range of information including available sample bill data, other carrier data, information from carriers' websites, tariff documents and discussions with mobile phone retailers. The carriers in the study were asked to comment on the proposed bundles and their comments were taken into account when constructing the final bundles priced. These bundles represented very low, low, medium, high, and very high usage patterns which closely approximated patterns that were likely to be derived by dividing sample bills into quintiles by bill expenditure (table A1.5).

Table A1.5. Bundles priced — assumed monthly calling patterns

	Very low	Low	Medium	High	Very high
Calls	4	20	55	125	290
Minutes	7	38	105	200	480
% Peak ²	50	60	70	80	80
% Off-peak ²	50	40	30	20	20
Voice mail ¹	0	0	5	20	50
Messaging ¹	0	0	5	10	20

Notes: 1. Voice mail and messaging services, although initially included, were excluded from the pricing, because of insufficient consistent information from the carriers about the number of voice and text 'calls' in each bundle.

2. Peak and Off-peak are further disaggregated to peak near, peak far and off-peak near, off-peak far.

Source: CRU estimates.

Choosing the plans

To price the consumption bundles we assumed that consumers always select the least cost plan and handset associated with their consumption pattern. This, however, is not always the case because consumers are often not certain about their future call frequency when signing onto a plan. Additionally, they may not have the time or resources to investigate all possible plans. The assumption, however, is a necessary simplification as adequate data are currently not available to explicitly model all the impediments to consumers making an optimal choice. By selecting the least cost plans, the prices estimated will thus be the lower bound prices for each bundle.

Mobile handsets and plans are sold directly to consumers by the carriers and through retail outlets. While some prices may vary from time to time between the carriers and retail outlets, packages, plans and the level of handset subsidy are generally set at the carrier level. Carrier prices will thus give an accurate picture of price movements over time.

The plans chosen by carriers had to fulfil a number of criteria to ensure that obscure and little used plans did not bias the results. Plans had to be, for example, widely available to all consumers for a reasonable period of time during the year and have been popular with subscribers. Carriers were also asked to provide the cost of handsets included as part of these packages.

The only restriction placed on the selection of the handset was that it was the latest model available and capable of providing the services in the consumption bundle. This moved away from previous approaches, which have assumed a particular handset make and model. The CRU judged this to be an unnecessary restriction as the least cost combinations were being priced and carriers may not necessarily include the assumed handset in their packages. In most cases, however, each carrier specified a similar handset for the same bundles and years.

The carriers provided plan and handset information for both post-paid and pre-paid mobile services corresponding to each bundle, for each year between 1996 and 2000. As Telstra, C&W Optus and Vodafone first introduced pre-paid services in 1997, data were only obtained for these services for the last three years.

Carriers included in the study

The prices and plans of Telstra, C&W Optus and Vodafone were used to measure price change for this exercise. These carriers currently dominate the mobile market, although the framework allows for other carriers or carriage service providers to be introduced into the analysis in subsequent years.

Pricing the bundles

The total cost of a bundle is determined by adding handset cost, connection, access and call charges (minus discounts). Text and voice messages were excluded from the analysis as insufficient information was available to reasonably determine the usage of these services.

Carrier feedback on the usage of these services also differed significantly and further information is required before a reasonable estimate can be made.

A separate price was calculated for each bundle for each year and each carrier for both pre-paid and post-paid services. In total 105 plans were used to obtain price estimates for this exercise.

Price calculations varied in each instance depending on the plan's structure with discounts such as free minutes or dollar discounts on call charges included where they occurred.

To calculate the price of a post-paid bundle, for example, the cost of the handset to the customer is divided by the contract length of the plan to give a per month cost (see table A1.6 for an illustrative calculation). The contract term is seen as the period over which the carrier expects to recoup the cost of the handset, as if the handset was being 'paid off' over this time.

Average connection charges over the study period were estimated using aggregate data provided by the carriers. While carriers have not changed their actual connection charges over the study period, the average connection charge has decreased by about 50 per cent because only one in two new customers now pay a connection charge. The 'average' connection charge was divided over 36 months, the assumed duration of the connection. Per month access charges are included in the overall cost.

Table A1.6. Sample price calculation

Plan name		Plan XYZ			
Plan length		24 months			\$
Handset type and cost		Nokia 5110			4.13
Connection					1.50
Access charge					50.00
No. of calls		Flagfall	\$/min	disc	Totals
24	PEAK LOCAL own network	0.25	0.40		21.84
32	PEAK LOCAL other network	0.35	0.50		37.60
48	PEAK LOCAL fixed network	0.35	0.50		56.40
8	PEAK FAR own network	0.25	0.40		7.28
12	PEAK FAR other network	0.35	0.50		14.10
16	PEAK FAR fixed network	0.35	0.50		18.80
6	OFF-PEAK LOCAL own network	0.25	0.40		5.46
8	OFF-PEAK LOCAL other network	0.35	0.50		9.40
12	OFF-PEAK LOCAL fixed network	0.35	0.50		14.10
2	OFF-PEAK FAR own network	0.25	0.40		1.82
3	OFF-PEAK FAR other network	0.35	0.50		3.53
4	OFF-PEAK FAR fixed network	0.35	0.50		4.70
Discounts	\$25 free calls			25.00	
Other call charges					
25	Peak voice mail				np
25	Off-peak voice mail				np
20	text messages				np
Total call charges					170.03
Total cost					225.66

Notes: 1. The average call duration = 1.65 minutes per call for all calls. Insufficient information was available to estimate an average call duration for each tariff category.

2. Connection charge is averaged over 36 months.

Source: Hypothetical example constructed by the CRU.

To price the calls in the bundle the overall number of calls in each bundle are divided between:

- Peak Local to: own network, other network and fixed line
- Peak Far to: own network, other network and fixed line
- Off-Peak Local to: own network, other network and fixed line
- Off-Peak Far to: own network, other network and fixed line

The calls are allocated, firstly using the splits specified in each bundle and then by the number of calls to other and own networks. These distinctions are important because the carriers can have different call charges for calls made to their own or other carriers' networks, or to local or long-distance destinations. The costs of these calls are then calculated using average bundle call duration (total minutes divided by total calls) and the applicable call charges, taking into account any flagfall or differences in rates for each part of the call.

The cost of calls may either be calculated on a per 30 seconds or a per second basis, depending on each plan.

Any discounts applicable to the plan such as free minutes or a set value of free calls are taken into account when determining total call charges, which can sometimes be zero depending on the plan.

The cost calculations were completed for each least cost plan in every bundle for every carrier for each of the last four years. This provided the raw price data required to build the index.

Modelling contract restrictions

Consumers on post-paid plans are likely to be spread across plans introduced over a number of years, which is likely to affect the prices paid by consumers for the same bundle in any one year. The contracts or plans often carry penalties if the consumer opts out of the agreement ahead of time. These contracts encourage consumers to remain connected to older plans after cheaper plans have been introduced. Even where this is not the case, consumers do not move instantaneously to the cheapest plans as soon as they become available for a number of reasons including lack of information. The methodology assumes that all consumers are able to move to the optimal plan within three years. The prices for the last two years are weighted more heavily because of the rapid increase in the penetration of mobile services and shorter contract lengths.

The prices of pre-paid services were not adjusted because users of these services are usually able to access lower charges for services as they become available.

Deriving the index

Once prices were adjusted to take into account consumers not moving instantaneously to the cheapest plans each year, the price relatives (current year price divided by base year price multiplied by 100) were calculated for each carrier for each bundle and year. An index for each bundle was then derived by weighting the price relatives according to the revenue share of each carrier in the study.

The overall index

The fixed-line and mobile index modules were brought together with a weighted average calculation. The weights were the revenue shares of mobile and fixed telephony services in the market for all the services included in the index model.

Quality of service

Quality may be interpreted to mean all the non-price attributes of a product or service. It would thus include, for example, performance, reliability, and features of the product or service. The Productivity Commission (1999, p. 151) adopted the following definition. Quality is:

... the totality of attributes embodied in (or associated with) a product or service that directly interact with the enjoyment (or utility) that consumers derive from that good or service ...

If changes in quality are ignored in the analysis of price change for telecommunications services, it is highly likely that the measured changes are not pure price changes. If quality does change and it can be measured, the base period price may be adjusted to reflect the quality change. The measured change in price after the adjustment is then a pure price change. However, the adjustment is difficult to make for telecommunications services and the ABS (1997) has no satisfactory arrangements in place to adjust the prices of these services in the CPI to reflect changes in quality. This is even though changes in quality are thought to be significant for these services.

If pure price changes are not measured, an analysis could misrepresent the effect of price changes on consumers. When there is a pure price increase, for example, consumer welfare declines. When the quality of a service increases, however, it increases the level of consumer welfare and they would be willing to pay a higher price to consume the same quantity of the service that they consumed before the quality improvement. A concurrent improvement in quality and price may thus leave consumer welfare unchanged. Another way of stating the problem is that measured price changes are likely to overstate pure price increases and understate decreases.

Under these circumstances, it is impossible to do anything other than acknowledge that a bias is likely to exist. As mentioned previously, the ABS (1997) reluctantly follows the same practice in the CPI for these and a small group of other high-risk services. This area requires further research.

Appendix 2. Points contributions and their uses

The points contribution of an index component is the number of points that a component contributes to the overall index in a particular year. It is calculated by multiplying the revenue share of a component in a basket by the value of the index in that year.

In year-on-year index calculations where the underlying quantity weights are held constant, the points contribution is a powerful analytical tool. It increases significantly the insights that may be gained about the year-on-year changes in the value of the index. To demonstrate, we shall consider an index of a basket of services that includes *YYY* (table A2.1).

Table A2.1. Points contributions and index numbers

Service	Index numbers			Points contribution		
	Year <i>t</i>	Year (<i>t+1</i>)	Percentage Change	Year <i>t</i>	Year (<i>t+1</i>)	Points Change
<i>YYY</i>	100.0	140.0	40.0	9.1	12.7	3.6
All services	100.0	112.7	12.7	100.0	112.7	12.7

Knowledge of the points contribution for each component of an index and the index number for a basket of services in each period provides an insight into the underlying dynamics changes in the price of the basket. It is possible to calculate the following.

- The effective weight or revenue share of each component in the index. It found for any period by dividing the points contribution of a component by the overall index.
 - The effective weight of *YYY* is therefore .091 (9.1/100) and .113 (12.7/112.7) in the years *t* and (*t+1*) of our illustrative example.
 - Furthermore, the effective weight has increased between *t* and (*t+1*), indicating that on average, the price of *YYY* has risen faster than the prices of all the other services in the basket as a group. This must be the case because the quantities have been kept constant in the year-to-year calculations.
- The relative contribution of the change in the price of one component to the change in the overall index.
 - This is given by points change for a component divided by the points change for the index.
 - The contribution made by service *YYY* in our illustrative example is 0.28 (3.6/12.7).
 - The 40 per cent increase in the price of *YYY* has therefore comprised 28 per cent of the increase in the price of the basket.

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- The proportional change in the overall index that would have occurred if the price of one component only had changed.
 - This is given by the points change for the component between t and $(t+1)$ divided by the overall index in t .
 - If the price of *YYY* only had changed by 40 per cent between t and $(t+1)$ in our illustrative example, the overall index would have increased by 3.6 per cent ($[3.6/100]*100$).
 - The average proportional change in the price of all other items in an index if the price of one component had remained unchanged.
 - This is given by subtracting the points contribution of the component whose price is being held constant from the overall index in periods t and $(t+1)$ and calculating the percentage change in the two new numbers.
 - If the price of *YYY* had remained constant between t and $(t+1)$ in our illustrative example, the overall index would have increased by 10 per cent ($100*[[112.7-12.7]/[100-9.1]]-1$)).
 - The effect that a forecast percentage change in the price of one component would have on the overall index in the next period.
 - This is given by applying the forecast change to the components points contribution and expressing the new number as a percentage of the overall index.
 - If the price of *YYY* increased by 20 per cent between $(t+1)$ and $(t+2)$, the overall index would increase by 13.5 per cent ($[100*[12.7*1.2]/112.7]$).

It is emphasised that these calculations and inferences may only be made for the year-on-year changes in the value of the index and not, for example, for changes between the base year and year 2. This is because the inferences rely on the underlying quantities being held constant, which is the case in the year-on-year calculations. The underlying quantities, however, are allowed to vary over the analysis period in the chained index.

The data required for completing these calculations on the indexes presented in this report are presented in appendix 3.

Appendix 3. Points contribution data for the year-on-year changes in price

We present in this appendix the data that analysts will require to complete their own investigations of the indexes using the techniques described in appendix 2.

Table A3.1. Standard index and points contributions for year-on-year changes in price. All service index over all consumers, 1996–97 to 1997–98

Index component	Standard index				Points contributions to standard index ^a		
	1996–97	1997–98	Points change	Percent change	1996–97	1997–98	Points change
Full basket	100.0	95.6	-4.4	-4.4	100.0	95.6	-4.4
Fixed line services	100.0	95.4	-4.6	-4.6	81.4	77.6	-3.7
Residential	100.0	94.7	-5.3	-5.3	51.2	48.5	-2.7
Basic access	100.0	100.0	0.0	0.0	10.5	10.5	0.0
Local calls	100.0	96.0	-4.0	-4.0	16.0	15.3	-0.6
National long-distance calls	100.0	89.2	-10.8	-10.8	13.2	11.8	-1.4
International calls	100.0	87.7	-12.3	-12.3	7.5	6.6	-0.9
Fixed to mobile calls	100.0	106.4	6.4	6.4	4.0	4.3	0.3
Business	100.0	96.6	-3.4	-3.4	30.2	29.1	-1.0
Basic access	100.0	100.9	0.9	0.9	5.2	5.2	0.0
Local calls	100.0	99.1	-0.9	-0.9	8.0	7.9	-0.1
National long-distance calls	100.0	91.9	-8.1	-8.1	9.0	8.2	-0.7
International calls	100.0	81.4	-18.6	-18.6	2.9	2.4	-0.5
Fixed to mobile calls	100.0	105.5	5.5	5.5	5.1	5.4	0.3
Mobile telephony	100.0	96.6	-3.4	-3.4	18.6	18.0	-0.6

a: The sum of the points attributed to each component of the index may not sum to the total due to rounding.

Source: CRU estimates based on data provided by AAPT, C&W Optus, One.Tel, Telstra and Vodafone.

Table A3.2. Standard index and points contributions for year-on-year changes in price. All service index over all consumers, 1997–98 to 1998–99

Index component	Standard index				Points contributions to standard index ^a		
	1997–98	1998–99	Points change	Percent change	1997–98	1998–99	Points change
Full basket	100.0	95.0	-5.0	-5.0	100.0	95.0	-5.0
Fixed line services	100.0	94.6	-5.4	-5.4	74.8	70.8	-4.0
Residential	100.0	94.8	-5.2	-5.2	44.8	42.5	-2.3
Basic access	100.0	99.4	-0.6	-0.6	9.3	9.3	-0.1
Local calls	100.0	98.8	-1.2	-1.2	14.2	14.0	-0.2
National long-distance calls	100.0	95.2	-4.8	-4.8	11.5	11.0	-0.6
International calls	100.0	76.3	-23.7	-23.7	5.7	4.4	-1.4
Fixed to mobile calls	100.0	95.6	-4.4	-4.4	4.1	3.9	-0.2
Business	100.0	94.4	-5.6	-5.6	30.0	28.3	-1.7
Basic access	100.0	98.4	-1.6	-1.6	5.2	5.1	-0.1
Local calls	100.0	100.1	0.1	0.1	8.6	8.6	0.0
National long-distance calls	100.0	91.8	-8.2	-8.2	7.4	6.8	-0.6
International calls	100.0	75.7	-24.3	-24.3	2.7	2.0	-0.6
Fixed to mobile calls	100.0	94.1	-5.9	-5.9	6.2	5.8	-0.4
Mobile telephony	100.0	96.1	-3.9	-3.9	25.2	24.2	-1.0

a: The sum of the points attributed to each component of the index may not sum to the total due to rounding.

Source: CRU estimates based on data provided by AAPT, C&W Optus, One.Tel, Telstra and Vodafone.

Table A3.3. Standard index and points contributions for year-on-year changes in price. All service index over all consumers, 1998–99 to 1999–2000

Index component	Standard index				Points contributions to standard index ^a		
	1998–99	1999–2000	Points change	Percent change	1998–99	1999–2000	Points change
Full basket	100.0	90.8	-9.2	-9.2	100.0	90.8	-9.2
Fixed line services	100.0	92.4	-7.6	-7.6	67.5	62.4	-5.1
Residential	100.0	92.3	-7.7	-7.7	39.9	36.9	-3.1
Basic access	100.0	109.8	9.8	9.8	8.4	9.3	0.8
Local calls	100.0	89.5	-10.5	-10.5	12.7	11.3	-1.3
National long-distance calls	100.0	89.8	-10.2	-10.2	10.1	9.1	-1.0
International calls	100.0	72.5	-27.5	-27.5	4.5	3.2	-1.2
Fixed to mobile calls	100.0	92.4	-7.6	-7.6	4.3	4.0	-0.3
Business	100.0	92.6	-7.4	-7.4	27.6	25.6	-2.0
Basic access	100.0	106.2	6.2	6.2	4.9	5.2	0.3
Local calls	100.0	91.9	-8.1	-8.1	7.9	7.3	-0.6
National long-distance calls	100.0	91.1	-8.9	-8.9	6.3	5.8	-0.6
International calls	100.0	70.4	-29.6	-29.6	2.0	1.4	-0.6
Fixed to mobile calls	100.0	91.5	-8.5	-8.5	6.5	5.9	-0.5
Mobile telephony	100.0	87.4	-12.6	-12.6	32.5	28.4	-4.1

a: The sum of the points attributed to each component of the index may not sum to the total due to rounding.

Source: CRU estimates based on data provided by AAPT, C&W Optus, One.Tel, Telstra and Vodafone.

Table A3.4. Standard index and points contributions for year-on-year changes in price; residential fixed-line index; 1996–97 to 1997–98

Index component	Standard index				Points contributions to standard index ^a		
	1996–97	1997–98	Points change	Percent change	1996–97	1997–98	Points change
Residential fixed line services	100.0	94.7	-5.3	-5.3	100.0	94.7	-5.3
Basic access	100.0	100.0	0.0	0.0	20.6	20.6	0.0
Local calls	100.0	96.0	-4.0	-4.0	31.2	29.9	-1.3
National long-distance calls	100.0	89.2	-10.8	-10.8	25.7	23.0	-2.8
International calls	100.0	87.7	-12.3	-12.3	14.6	12.8	-1.8
Fixed to mobile calls	100.0	106.4	6.4	6.4	7.9	8.4	0.5

a: The sum of the points attributed to each component of the index may not sum to the total due to rounding.

Source: CRU estimates based on data provided by AAPT, C&W Optus, One.Tel and Telstra.

Table A3.5. Standard index and points contributions for year-on-year changes in price; residential fixed-line index; 1997–98 to 1998–99

Index component	Standard index				Points contributions to standard index ^a		
	1997–98	1998–99	Points change	Percent change	1997–98	1998–99	Points change
Residential fixed line services	100.0	94.8	-5.2	-5.2	100.0	94.8	-5.2
Basic access	100.0	99.4	-0.6	-0.6	20.8	20.7	-0.1
Local calls	100.0	98.8	-1.2	-1.2	31.6	31.2	-0.4
National long-distance calls	100.0	95.2	-4.8	-4.8	25.8	24.5	-1.2
International calls	100.0	76.3	-23.7	-23.7	12.8	9.7	-3.0
Fixed to mobile calls	100.0	95.6	-4.4	-4.4	9.1	8.7	-0.4

a: The sum of the points attributed to each component of the index may not sum to the total due to rounding.

Source: CRU estimates based on data provided by AAPT, C&W Optus, One.Tel and Telstra.

Table A3.6. Standard index and points contributions for year-on-year changes in price; residential fixed-line index; 1998–99 to 1999–2000

Index component	Standard index				Points contributions to standard index ^a		
	1998–99	1999–2000	Points change	Percent change	1998–99	1999–2000	Points change
Residential fixed line services	100.0	92.3	-7.7	-7.7	100.0	92.3	-7.7
Basic access	100.0	109.8	9.8	9.8	21.1	23.2	2.1
Local calls	100.0	89.5	-10.5	-10.5	31.7	28.4	-3.3
National long-distance calls	100.0	89.8	-10.2	-10.2	25.3	22.7	-2.6
International calls	100.0	72.5	-27.5	-27.5	11.2	8.1	-3.1
Fixed to mobile calls	100.0	92.4	-7.6	-7.6	10.7	9.9	-0.8

a: The sum of the points attributed to each component of the index may not sum to the total due to rounding.

Source: CRU estimates based on data provided by AAPT, C&W Optus, One.Tel and Telstra.

Table A3.7. Standard index and points contributions for year-on-year changes in price; business fixed-line index; 1996–97 to 1997–98

Index component	Standard index				Points contributions to standard index ^a		
	1996–97	1997–98	Points change	Percent change	1996–97	1997–98	Points change
Business fixed line services	100.0	96.6	-3.4	-3.4	100.0	96.6	-3.4
Small business	100.0	93.0	-7.0	-7.0	26.6	24.7	-1.9
Basic access	100.0	103.2	3.2	3.2	5.2	5.4	0.2
Local calls	100.0	92.3	-7.7	-7.7	6.4	5.9	-0.5
National long-distance calls	100.0	87.5	-12.5	-12.5	7.4	6.5	-0.9
International calls	100.0	80.4	-19.6	-19.6	4.1	3.3	-0.8
Fixed to mobile calls	100.0	105.0	5.0	5.0	3.6	3.8	0.2
Other business	100.0	97.9	-2.1	-2.1	73.4	71.9	-1.5
Basic access	100.0	100.0	0.0	0.0	12.0	12.0	0.0
Local calls	100.0	101.3	1.3	1.3	20.0	20.3	0.3
National long-distance calls	100.0	93.3	-6.7	-6.7	22.4	20.9	-1.5
International calls	100.0	82.1	-17.9	-17.9	5.7	4.7	-1.0
Fixed to mobile calls	100.0	105.6	5.6	5.6	13.3	14.1	0.7

a: The sum of the points attributed to each component of the index may not sum to the total due to rounding.

Source: CRU estimates based on data provided by AAPT, C&W Optus, One.Tel and Telstra.

Table A3.8. Standard index and points contributions for year-on-year changes in price; business fixed-line index; 1997–98 to 1998–99

Index component	Standard index				Points contributions to standard index ^a		
	1997–98	1998–99	Points change	Percent change	1997–98	1998–99	Points change
Business fixed line services	100.0	94.4	-5.6	-5.6	100.0	94.4	-5.6
Small business	100.0	97.3	-2.7	-2.7	24.0	23.3	-0.7
Basic access	100.0	93.0	-7.0	-7.0	4.7	4.4	-0.3
Local calls	100.0	106.8	6.8	6.8	6.1	6.6	0.4
National long-distance calls	100.0	98.6	-1.4	-1.4	6.2	6.1	-0.1
International calls	100.0	88.8	-11.2	-11.2	3.4	3.1	-0.4
Fixed to mobile calls	100.0	92.4	-7.6	-7.6	3.5	3.3	-0.3
Other business	100.0	93.5	-6.5	-6.5	76.0	71.1	-5.0
Basic access	100.0	100.4	0.4	0.4	12.8	12.8	0.1
Local calls	100.0	98.2	-1.8	-1.8	22.4	22.0	-0.4
National long-distance calls	100.0	89.6	-10.4	-10.4	18.4	16.5	-1.9
International calls	100.0	67.4	-32.6	-32.6	5.4	3.7	-1.8
Fixed to mobile calls	100.0	94.4	-5.6	-5.6	17.0	16.0	-0.9

a: The sum of the points attributed to each component of the index may not sum to the total due to rounding.

Source: CRU estimates based on data provided by AAPT, C&W Optus, One.Tel and Telstra.

Table A3.9. Standard index and points contributions for year-on-year changes in price; business fixed-line index; 1998–99 to 1999–2000

Index component	Standard index				Points contributions to standard index ^a		
	1998–99	1999–2000	Points change	Percent change	1998–99	1999–2000	Points change
Business fixed line services	100.0	92.6	-7.4	-7.4	100.0	92.6	-7.4
Small business	100.0	91.2	-8.8	-8.8	24.0	21.9	-2.1
Basic access	100.0	107.8	7.8	7.8	4.5	4.9	0.4
Local calls	100.0	91.3	-8.7	-8.7	6.6	6.1	-0.6
National long-distance calls	100.0	88.9	-11.1	-11.1	6.1	5.4	-0.7
International calls	100.0	63.7	-36.3	-36.3	2.8	1.8	-1.0
Fixed to mobile calls	100.0	94.6	-5.4	-5.4	4.0	3.8	-0.2
Other business	100.0	93.0	-7.0	-7.0	76.0	70.7	-5.3
Basic access	100.0	105.6	5.6	5.6	13.2	13.9	0.7
Local calls	100.0	92.1	-7.9	-7.9	22.0	20.2	-1.7
National long-distance calls	100.0	91.9	-8.1	-8.1	16.8	15.5	-1.4
International calls	100.0	74.6	-25.4	-25.4	4.5	3.3	-1.1
Fixed to mobile calls	100.0	90.9	-9.1	-9.1	19.5	17.7	-1.8

a: The sum of the points attributed to each component of the index may not sum to the total due to rounding.

Source: CRU estimates based on data provided by AAPT, C&W Optus, One.Tel and Telstra.

Table A3.10. Standard index and points contributions for year-on-year changes in price; basic access index; 1996–97 to 1997–98

Index component	Standard index				Points contributions to standard index ^a		
	1996–97	1997–98	Points change	Percent change	1996–97	1997–98	Points change
Basic access	100.0	100.3	0.3	0.3	100.0	100.3	0.3
Residential consumers	100.0	100.0	0.0	0.0	67.0	67.1	0.0
Business consumers	100.0	100.9	0.9	0.9	33.0	33.3	0.3

a: The sum of the points attributed to each component of the index may not sum to the total due to rounding.

Source: CRU estimates based on data provided by AAPT, C&W Optus, One.Tel and Telstra.

Table A3.11. Standard index and points contributions for year-on-year changes in price; basic access index; 1997–98 to 1998–99

Index component	Standard index				Points contributions to standard index ^a		
	1997–98	1998–99	Points change	Percent change	1997–98	1998–99	Points change
Basic access	100.0	99.0	-1.0	-1.0	100.0	99.0	-1.0
Residential consumers	100.0	99.4	-0.6	-0.6	64.1	63.7	-0.4
Business consumers	100.0	98.4	-1.6	-1.6	35.9	35.4	-0.6

a: The sum of the points attributed to each component of the index may not sum to the total due to rounding.

Source: CRU estimates based on data provided by AAPT, C&W Optus, One.Tel and Telstra.

Table A3.12. Standard index and points contributions for year-on-year changes in price; basic access index; 1998–99 to 1999–2000

Index component	Standard index				Points contributions to standard index ^a		
	1998–99	1999–2000	Points change	Percent change	1998–99	1999–2000	Points change
Basic access	100.0	109.5	9.5	9.5	100.0	109.5	9.5
Residential consumers	100.0	109.8	9.8	9.8	63.3	70.2	6.9
Business consumers	100.0	106.2	6.2	6.2	36.7	39.3	2.7

a: The sum of the points attributed to each component of the index may not sum to the total due to rounding.

Source: CRU estimates based on data provided by AAPT, C&W Optus, One.Tel and Telstra.

Table A3.13. Standard index and points contributions for year-on-year changes in price; local calls index; 1996–97 to 1997–98

Index component	Standard index				Points contributions to standard index ^a		
	1996–97	1997–98	Points change	Percent change	1996–97	1997–98	Points change
Local calls	100.0	97.0	-3.0	-3.0	100.0	97.0	-3.0
Residential consumers	100.0	96.0	-4.0	-4.0	66.8	64.0	-2.7
Business consumers	100.0	99.1	-0.9	-0.9	33.2	33.0	-0.3

a: The sum of the points attributed to each component of the index may not sum to the total due to rounding.

Source: CRU estimates based on data provided by AAPT, C&W Optus, One.Tel and Telstra.

Table A3.14. Standard index and points contributions for year-on-year changes in price; local calls index; 1997–98 to 1998–99

Index component	Standard index				Points contributions to standard index ^a		
	1997–98	1998–99	Points change	Percent change	1997–98	1998–99	Points change
Local calls	100.0	99.3	–0.7	–0.7	100.0	99.3	–0.7
Residential consumers	100.0	98.8	–1.2	–1.2	62.3	61.6	–0.8
Business consumers	100.0	100.1	0.1	0.1	37.7	37.7	0.0

a: The sum of the points attributed to each component of the index may not sum to the total due to rounding.

Source: CRU estimates based on data provided by AAPT, C&W Optus, One.Tel and Telstra.

Table A3.15. Standard index and points contributions for year-on-year changes in price; local calls index; 1998–99 to 1999–2000

Index component	Standard index				Points contributions to standard index ^a		
	1998–99	1999–2000	Points change	Percent change	1998–99	1999–2000	Points change
Basic access	100.0	90.4	–9.6	–9.6	100.0	90.4	–9.6
Residential consumers	100.0	89.5	–10.5	–10.5	61.6	55.1	–6.5
Business consumers	100.0	91.9	–8.1	–8.1	38.4	35.3	–3.1

a: The sum of the points attributed to each component of the index may not sum to the total due to rounding.

Source: CRU estimates based on data provided by AAPT, C&W Optus, One.Tel and Telstra.

Table A3.16. Standard index and points contributions for year-on-year changes in price; national long-distance calls index; 1996–97 to 1997–98

Index component	Standard index				Points contributions to standard index ^a		
	1996–97	1997–98	Points change	Percent change	1996–97	1997–98	Points change
National long-distance calls	100.0	90.3	–9.7	–9.7	100.0	90.3	–9.7
Residential consumers	100.0	89.2	–10.8	–10.8	59.5	53.1	–6.4
Business consumers	100.0	91.9	–8.1	–8.1	40.5	37.2	–3.3

a: The sum of the points attributed to each component of the index may not sum to the total due to rounding.

Source: CRU estimates based on data provided by AAPT, C&W Optus, One.Tel and Telstra.

Table A3.17. Standard index and points contributions for year-on-year changes in price; national long-distance calls index; 1997–98 to 1998–99

Index component	Standard index				Points contributions to standard index ^a		
	1997–98	1998–99	Points change	Percent change	1997–98	1998–99	Points change
National long-distance calls	100.0	93.8	-6.2	-6.2	100.0	93.8	-6.2
Residential consumers	100.0	95.2	-4.8	-4.8	61.1	58.1	-3.0
Business consumers	100.0	91.8	-8.2	-8.2	38.9	35.7	-3.2

a: The sum of the points attributed to each component of the index may not sum to the total due to rounding.

Source: CRU estimates based on data provided by AAPT, C&W Optus, One.Tel and Telstra.

Table A3.18. Standard index and points contributions for year-on-year changes in price; national long-distance calls index; 1998–99 to 1999–2000

Index component	Standard index				Points contributions to standard index ^a		
	1998–99	1999–2000	Points change	Percent change	1998–99	1999–2000	Points change
National long-distance calls	100.0	90.3	-9.7	-9.7	100.0	90.3	-9.7
Residential consumers	100.0	89.8	-10.2	-10.2	61.4	55.2	-6.2
Business consumers	100.0	91.1	-8.9	-8.9	38.6	35.2	-3.4

a: The sum of the points attributed to each component of the index may not sum to the total due to rounding.

Source: CRU estimates based on data provided by AAPT, C&W Optus, One.Tel and Telstra.

Table A3.19. Standard index and points contributions for year-on-year changes in price; international calls index; 1996–97 to 1997–98

Index component	Standard index				Points contributions to standard index ^a		
	1996–97	1997–98	Points change	Percent change	1996–97	1997–98	Points change
International calls	100.0	85.9	-14.1	-14.1	100.0	85.9	-14.1
Residential consumers	100.0	87.7	-12.3	-12.3	71.8	63.0	-8.9
Business consumers	100.0	81.4	-18.6	-18.6	28.2	22.9	-5.3

a: The sum of the points attributed to each component of the index may not sum to the total due to rounding.

Source: CRU estimates based on data provided by AAPT, C&W Optus, One.Tel and Telstra.

Table A3.20. Standard index and points contributions for year-on-year changes in price; international calls index; 1997–98 to 1998–99

Index component	Standard index				Points contributions to standard index ^a		
	1997–98	1998–99	Points change	Percent change	1997–98	1998–99	Points change
International calls	100.0	76.1	-23.9	-23.9	100.0	76.1	-23.9
Residential consumers	100.0	76.3	-23.7	-23.7	68.3	52.1	-16.2
Business consumers	100.0	75.7	-24.3	-24.3	31.7	24.0	-7.7

a: The sum of the points attributed to each component of the index may not sum to the total due to rounding.

Source: CRU estimates based on data provided by AAPT, C&W Optus, One.Tel and Telstra.

Table A3.21. Standard index and points contributions for year-on-year changes in price; international calls index; 1998–99 to 1999–2000

Index component	Standard index				Points contributions to standard index ^a		
	1998–99	1999–2000	Points change	Percent change	1998–99	1999–2000	Points change
International calls	100.0	71.9	-28.1	-28.1	100.0	71.9	-28.1
Residential consumers	100.0	72.5	-27.5	-27.5	68.9	50.0	-18.9
Business consumers	100.0	70.4	-29.6	-29.6	31.1	21.9	-9.2

a: The sum of the points attributed to each component of the index may not sum to the total due to rounding.

Source: CRU estimates based on data provided by AAPT, C&W Optus, One.Tel and Telstra.

Table A3.22. Standard index and points contributions for year-on-year changes in price; fixed to mobiles calls index; 1996–97 to 1997–98

Index component	Standard index				Points contributions to standard index ^a		
	1996–97	1997–98	Points change	Percent change	1996–97	1997–98	Points change
Fixed to mobile calls	100.0	105.9	5.9	5.9	100.0	105.9	5.9
Residential consumers	100.0	106.4	6.4	6.4	44.1	46.9	2.8
Business consumers	100.0	105.5	5.5	5.5	55.9	59.0	3.1

a: The sum of the points attributed to each component of the index may not sum to the total due to rounding.

Source: CRU estimates based on data provided by AAPT, C&W Optus, One.Tel and Telstra.

Table A3.23. Standard index and points contributions for year-on-year changes in price; fixed to mobiles calls index; 1997–98 to 1998–99

Index component	Standard index				Points contributions to standard index ^a		
	1997–98	1998–99	Points change	Percent change	1997–98	1998–99	Points change
Fixed to mobile calls	100.0	94.7	-5.3	-5.3	100.0	94.7	-5.3
Residential consumers	100.0	95.6	-4.4	-4.4	39.9	38.1	-1.8
Business consumers	100.0	94.1	-5.9	-5.9	60.1	56.6	-3.6

a: The sum of the points attributed to each component of the index may not sum to the total due to rounding.

Source: CRU estimates based on data provided by AAPT, C&W Optus, One.Tel and Telstra.

Table A3.24. Standard index and points contributions for year-on-year changes in price; fixed to mobiles calls index; 1998–99 to 1999–2000

Index component	Standard index				Points contributions to standard index ^a		
	1998–99	1999–2000	Points change	Percent change	1998–99	1999–2000	Points change
Basic access	100.0	91.9	-8.1	-8.1	100.0	91.9	-8.1
Residential consumers	100.0	92.4	-7.6	-7.6	39.7	36.7	-3.0
Business consumers	100.0	91.5	-8.5	-8.5	60.3	55.1	-5.1

a: The sum of the points attributed to each component of the index may not sum to the total due to rounding.

Source: CRU estimates based on data provided by AAPT, C&W Optus, One.Tel and Telstra.

Table A3.25. Standard index and points contributions for year-on-year changes in price; capital fixed-line index; 1996–97 to 1997–98

Index component	Standard index				Points contributions to standard index ^a		
	1996–97	1997–98	Points change	Percent change	1996–97	1997–98	Points change
Fixed line services (capital cities)	100.0	96.5	-3.5	-3.5	100.0	96.5	-3.5
Residential	100.0	96.7	-3.3	-3.3	89.4	86.5	-3.0
Basic access	100.0	99.5	-0.5	-0.5	2.3	2.3	0.0
Local calls	100.0	98.5	-1.5	-1.5	40.9	40.3	-0.6
National long-distance calls	100.0	98.2	-1.8	-1.8	18.6	18.3	-0.3
International calls	100.0	86.8	-13.2	-13.2	16.9	14.7	-2.2
Fixed to mobile calls	100.0	102.0	2.0	2.0	10.7	10.9	0.2
Small business	100.0	94.9	-5.1	-5.1	10.6	10.0	-0.5
Basic access	100.0	100.3	0.3	0.3	0.4	0.4	0.0
Local calls	100.0	99.6	-0.4	-0.4	3.1	3.1	0.0
National long-distance calls	100.0	93.0	-7.0	-7.0	3.0	2.8	-0.2
International calls	100.0	76.7	-23.3	-23.3	1.4	1.1	-0.3
Fixed to mobile calls	100.0	100.8	0.8	0.8	2.6	2.6	0.0

a: The sum of the points attributed to each component of the index may not sum to the total due to rounding.

Source: CRU estimates based on data provided by AAPT, C&W Optus, One.Tel and Telstra.

Table A3.26. Standard index and points contributions for year-on-year changes in price; capital fixed-line index; 1997–98 to 1998–99

Index component	Standard index				Points contributions to standard index ^a		
	1997–98	1998–99	Points change	Percent change	1997–98	1998–99	Points change
Fixed line services (capital cities)	100.0	88.3	-11.7	-11.7	100.0	88.3	-11.7
Residential	100.0	88.1	-11.9	-11.9	89.0	78.5	-10.6
Basic access	100.0	99.3	-0.7	-0.7	2.0	2.0	0.0
Local calls	100.0	95.9	-4.1	-4.1	37.3	35.7	-1.5
National long-distance calls	100.0	89.6	-10.4	-10.4	22.8	20.4	-2.4
International calls	100.0	62.1	-37.9	-37.9	16.6	10.3	-6.3
Fixed to mobile calls	100.0	96.0	-4.0	-4.0	10.5	10.1	-0.4
Small business	100.0	90.1	-9.9	-9.9	11.0	9.9	-1.1
Basic access	100.0	71.5	-28.5	-28.5	0.4	0.3	-0.1
Local calls	100.0	96.8	-3.2	-3.2	3.3	3.2	-0.1
National long-distance calls	100.0	91.4	-8.6	-8.6	3.3	3.0	-0.3
International calls	100.0	66.1	-33.9	-33.9	1.4	1.0	-0.5
Fixed to mobile calls	100.0	96.1	-3.9	-3.9	2.5	2.4	-0.1

a: The sum of the points attributed to each component of the index may not sum to the total due to rounding.

Source: CRU estimates based on data provided by AAPT, C&W Optus, One.Tel and Telstra.

Table A3.27. Standard index and points contributions for year-on-year changes in price; capital fixed-line index; 1998–99 to 1999–2000

Index component	Standard index				Points contributions to standard index ^a		
	1998–99	1999–2000	Points change	Percent change	1998–99	1999–2000	Points change
Fixed line services (capital cities)	100.0	88.1	-11.9	-11.9	100.0	88.1	-11.9
Residential	100.0	87.7	-12.3	-12.3	91.0	79.8	-11.2
Basic access	100.0	114.5	14.5	14.5	2.2	2.5	0.3
Local calls	100.0	81.3	-18.7	-18.7	40.1	32.6	-7.5
National long-distance calls	100.0	98.3	-1.7	-1.7	21.6	21.3	-0.4
International calls	100.0	74.9	-25.1	-25.1	13.0	9.7	-3.3
Fixed to mobile calls	100.0	96.8	-3.2	-3.2	14.0	13.6	-0.5
Small business	100.0	92.1	-7.9	-7.9	9.0	8.3	-0.7
Basic access	100.0	140.2	40.2	40.2	0.3	0.4	0.1
Local calls	100.0	82.7	-17.3	-17.3	2.9	2.4	-0.5
National long-distance calls	100.0	97.1	-2.9	-2.9	2.5	2.5	-0.1
International calls	100.0	74.0	-26.0	-26.0	0.7	0.5	-0.2
Fixed to mobile calls	100.0	97.3	-2.7	-2.7	2.5	2.4	-0.1

a: The sum of the points attributed to each component of the index may not sum to the total due to rounding.

Source: CRU estimates based on data provided by AAPT, C&W Optus, One.Tel and Telstra.

Table A3.28. Standard index and points contributions for year-on-year changes in price; non-capital fixed-line index; 1996–97 to 1997–98

Index component	Standard index				Points contributions to standard index ^a		
	1996–97	1997–98	Points change	Percent change	1996–97	1997–98	Points change
Fixed line services (non-capital cities)	100.0	97.5	-2.5	-2.5	100.0	97.5	-2.5
Residential	100.0	97.7	-2.3	-2.3	88.3	86.3	-2.0
Basic access	100.0	99.1	-0.9	-0.9	2.7	2.7	0.0
Local calls	100.0	99.1	-0.9	-0.9	29.0	28.8	-0.3
National long-distance calls	100.0	97.8	-2.2	-2.2	40.6	39.8	-0.9
International calls	100.0	84.6	-15.4	-15.4	7.1	6.0	-1.1
Fixed to mobile calls	100.0	102.4	2.4	2.4	8.9	9.1	0.2
Small business	100.0	95.8	-4.2	-4.2	11.7	11.2	-0.5
Basic access	100.0	99.5	-0.5	-0.5	0.6	0.6	0.0
Local calls	100.0	99.7	-0.3	-0.3	2.2	2.2	0.0
National long-distance calls	100.0	94.0	-6.0	-6.0	6.2	5.8	-0.4
International calls	100.0	71.9	-28.1	-28.1	0.6	0.4	-0.2
Fixed to mobile calls	100.0	102.8	2.8	2.8	2.1	2.2	0.1

a: The sum of the points attributed to each component of the index may not sum to the total due to rounding.

Source: CRU estimates based on data provided by AAPT, C&W Optus, One.Tel and Telstra.

Table A3.29. Standard index and points contributions for year-on-year changes in price; non-capital fixed-line index; 1997–98 to 1998–99

Index component	Standard index				Points contributions to standard index ^a		
	1997–98	1998–99	Points change	Percent change	1997–98	1998–99	Points change
Fixed line services (non-capital cities)	100.0	89.1	-10.9	-10.9	100.0	89.1	-10.9
Residential	100.0	89.0	-11.0	-11.0	88.7	79.0	-9.7
Basic access	100.0	100.2	0.2	0.2	2.2	2.2	0.0
Local calls	100.0	96.2	-3.8	-3.8	23.9	23.0	-0.9
National long-distance calls	100.0	87.2	-12.8	-12.8	47.0	41.0	-6.0
International calls	100.0	67.7	-32.3	-32.3	8.1	5.5	-2.6
Fixed to mobile calls	100.0	97.3	-2.7	-2.7	7.5	7.3	-0.2
Small business	100.0	90.0	-10.0	-10.0	11.3	10.2	-1.1
Basic access	100.0	59.8	-40.2	-40.2	0.5	0.3	-0.2
Local calls	100.0	96.9	-3.1	-3.1	2.1	2.0	-0.1
National long-distance calls	100.0	90.8	-9.2	-9.2	6.1	5.5	-0.6
International calls	100.0	69.3	-30.7	-30.7	0.8	0.5	-0.2
Fixed to mobile calls	100.0	96.8	-3.2	-3.2	1.8	1.8	-0.1

a: The sum of the points attributed to each component of the index may not sum to the total due to rounding.

Source: CRU estimates based on data provided by AAPT, C&W Optus, One.Tel and Telstra.

Table A3.30. Standard index and points contributions for year-on-year changes in price; non-capital fixed-line index; 1998–99 to 1999–2000

Index component	Standard index				Points contributions to standard index ^a		
	1998–99	1999–2000	Points change	Percent change	1998–99	1999–2000	Points change
Fixed line services (non-capital cities)	100.0	89.3	-10.7	-10.7	100.0	89.3	-10.7
Residential	100.0	88.6	-11.4	-11.4	91.2	80.8	-10.4
Basic access	100.0	117.1	17.1	17.1	2.5	3.0	0.4
Local calls	100.0	76.3	-23.7	-23.7	27.2	20.7	-6.4
National long-distance calls	100.0	95.0	-5.0	-5.0	44.6	42.4	-2.2
International calls	100.0	76.5	-23.5	-23.5	6.4	4.9	-1.5
Fixed to mobile calls	100.0	93.3	-6.7	-6.7	10.5	9.8	-0.7
Small business	100.0	96.9	-3.1	-3.1	8.8	8.5	-0.3
Basic access	100.0	141.0	41.0	41.0	0.3	0.5	0.1
Local calls	100.0	91.9	-8.1	-8.1	1.8	1.7	-0.1
National long-distance calls	100.0	98.5	-1.5	-1.5	4.6	4.5	-0.1
International calls	100.0	74.6	-25.4	-25.4	0.3	0.2	-0.1
Fixed to mobile calls	100.0	93.2	-6.8	-6.8	1.8	1.7	-0.1

a: The sum of the points attributed to each component of the index may not sum to the total due to rounding.

Source: CRU estimates based on data provided by AAPT, C&W Optus, One.Tel and Telstra.

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Commission contacts

ACT (national office)

470 Northbourne Avenue
DICKSON ACT 2602

PO Box 1199, DICKSON ACT 2602

Tel: (02) 6243 1111

Fax: (02) 6243 1199

New South Wales

Level 5, Skygarden
77 Castlereagh Street
SYDNEY NSW 2000

GPO Box 3648, SYDNEY NSW 1044

Tel: (02) 9230 9133

Fax: (02) 9223 1092

Tamworth

39 Kable Avenue
TAMWORTH NSW 2340

PO Box 2071

TAMWORTH NSW 2340

Tel: (02) 6761 2000

Fax: (02) 6761 2445

Victoria

Level 35, The Tower
Melbourne Central
360 Elizabeth Street
MELBOURNE VIC 3000

GPO Box 520J, MELBOURNE VIC 3001

Tel: (03) 9290 1800

Fax: (03) 9663 3699

South Australia

14th Floor, ANZ House
13 Grenfell Street
ADELAIDE SA 5000

GPO Box 922, ADELAIDE SA 5001

Tel: (08) 8213 3444

Fax: (08) 8410 4155

Queensland

Level 3, AAMI Building
500 Queen Street
BRISBANE QLD 4000

PO Box 10048

Adelaide Street Post Office

BRISBANE QLD 4000

Tel: (07) 3835 4666

Fax: (07) 3832 0372

North Queensland

Level 6, Commonwealth Bank Building
Flinders Mall, TOWNSVILLE QLD 4810

PO Box 2016, TOWNSVILLE QLD 4810

Tel: (07) 4729 2666

Fax: (07) 4721 1538

Western Australia

3rd floor, East Point Plaza
233 Adelaide Terrace
PERTH WA 6000

PO Box 6381, EAST PERTH WA 6892

Tel: (08) 9325 3622

Fax: (08) 9325 5976

Tasmania

3rd floor, AMP Building
86 Collins St
HOBART TAS 7000

GPO Box 1210, HOBART TAS 7001

Tel: (03) 6215 9333

Fax: (03) 6234 7796

Northern Territory

Level 8, National Mutual Centre
9–11 Cavenagh Street
DARWIN NT 0800

GPO Box 3056, DARWIN NT 0801

Tel: (08) 8946 9666

Fax: (08) 8946 9600