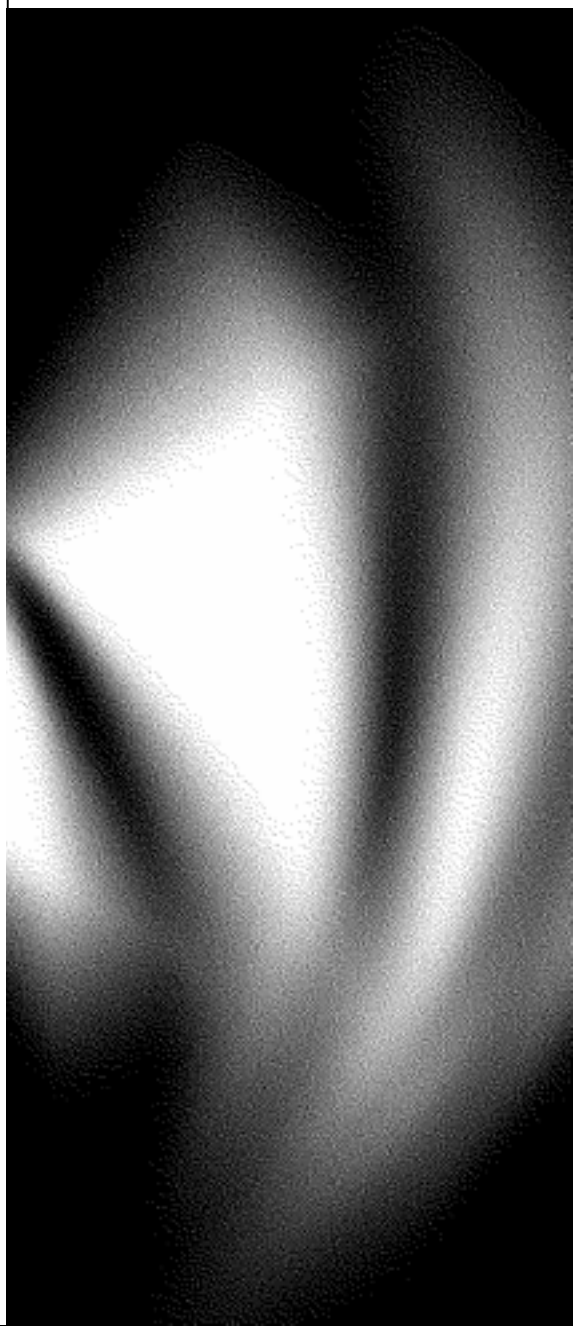
PRODUCTIVITY COMMISSION

Aspects of Structural Change in Australia

Research Paper



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The Productivity Commission

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

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Foreword

Structural change and adjustment play an integral role in the process of economic growth and hence in raising the living standards of Australians. While much structural change is an outcome of changing market conditions, governments also have an important influence.

Structural change and associated adjustment issues are of central concern to the Productivity Commission. The Commission is required by its charter to have regard to the Government's desire to facilitate adjustment within the economy by those people, industries and regions affected by its policy proposals. Responding to the challenge of lifting Australia's productivity performance reinforces the importance of examining adjustment related issues.

To this end, in addition to focussing on adjustment issues in its public inquiries, the Commission is undertaking a broad stream of research directed at examining the adjustment and regional consequences of economic change. It is also examining adjustment issues in the context of the operation of Australia's labour market and the conduct of competition policy.

This report is part of that stream of work. It provides factual information about structural change in Australia since the early 1970s. The areas examined include comparisons of the direction and extent of structural change in Australia and a selection of other countries, the extent and nature of adjustment among Australia's regions, and some key developments in Australia's labour market.

Gary Banks
Chairman

December 1998

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Acknowledgments

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Abbreviations

ABARE	Australian Bureau of Agricultural and Resource Economics
ABS	Australian Bureau of Statistics
ASGC	Australian Standard Geographical Classification
ASIC	Australian Standard Industrial Classification
DEETYA	Department of Employment, Education, Training and Youth Affairs
EPAC	Economic Planning Advisory Commission
G7 countries	Group of seven leading industrialised countries (United States, Japan, Germany, France, Italy, United Kingdom and Canada)
GDP	Gross domestic product
IAC	Industries Assistance Commission
IC	Industry Commission
IEDB	International Economic Data Bank
IRDB	Integrated Regional Data Base
ISDB	International Sectoral Data Base
ISIC	International Standard Industrial Classification
OECD	Organisation for Economic Co-operation and Development
PC	Productivity Commission
RCI	Regional change index
RBA	Reserve Bank of Australia
SCI	Structural change index(es)
SDs	Statistical divisions
SSDs	Statistical subdivisions
TCF	Textiles, clothing and footwear
UN	United Nations
UNIDO	United Nations Industrial Development Organization

Overview

Structural change refers to changes in the overall size and make-up of an economy in terms of the distribution of activity and resources among firms, industries and regions.

A variety of market-related influences (including technological advances and changes in spending patterns and trade) and government-related influences (such as reforms to infrastructure services and labour market regulations) combine to create pressures for adjustment and structural change. These pressures vary over time and across countries, as well as between different regions and industries within countries.

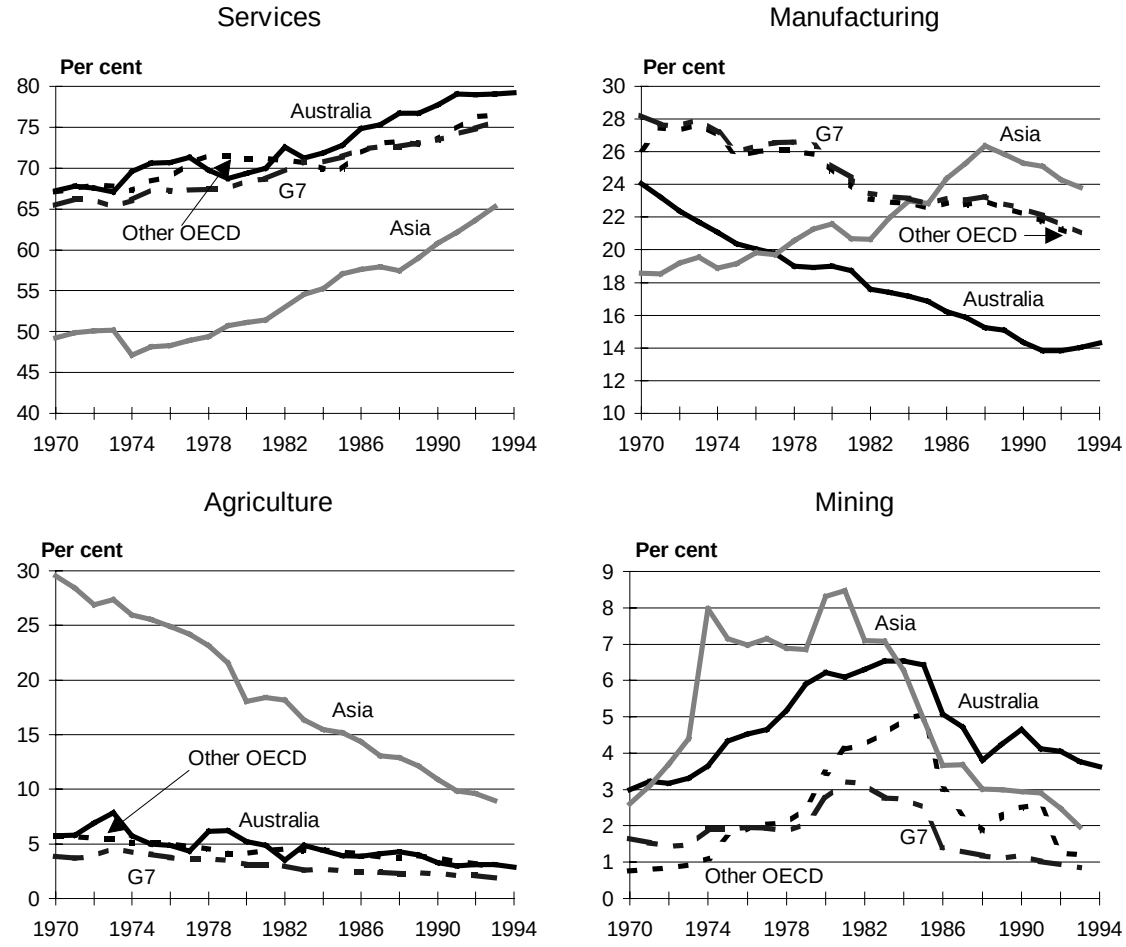
Structural change is often essential if communities are to take advantage of growth opportunities and enhance their general living standards. Nevertheless, while much structural change appears to be readily accommodated, it can impose costs and cause difficulties for some groups in the community. These different dimensions of structural change illustrate why it attracts widespread and sustained interest across the community.

This research report provides a factual account of key aspects of the process of structural change within the Australian economy since the early 1970s. It complements other work currently underway within the Commission relating to the role of government in the adjustment process.

The broad direction of structural change

- Since 1970, Australia has shared some features of structural change in common with other OECD countries and a number of Asian countries (figure 1).
  - For instance, the services sector has expanded its share of output considerably.
  - The relative sizes of the manufacturing and agricultural sectors have declined.
  - There have, however, been considerable differences across countries in both sector and industry specific growth rates.

Figure 1 **Sector shares of GDP, selected countries, 1970 to 1994**
Measured in current prices



Source: Figure 2.1 in main text.

- Services comprise the largest sector of the economies of the OECD and more advanced Asian countries. Its relative size increased in all countries between 1970 and 1994, with Australia's services sector expanding more rapidly than in most other OECD countries. However, within the sector, there were sizeable variations in growth rates.
  - For instance, Australia's Wholesale and retail trade, Transport and communications and Construction industries experienced reductions in their shares of services sector output.
  - In contrast, the shares of the Financial services and Community and public services industries increased.
- Although Australia's manufacturing sector was already one of the smallest (as a share of GDP) among the OECD countries in 1970, it recorded one of the sharpest proportionate falls over the period. In contrast, the sector expanded strongly in most Asian economies throughout the 1970s and most of the 1980s.

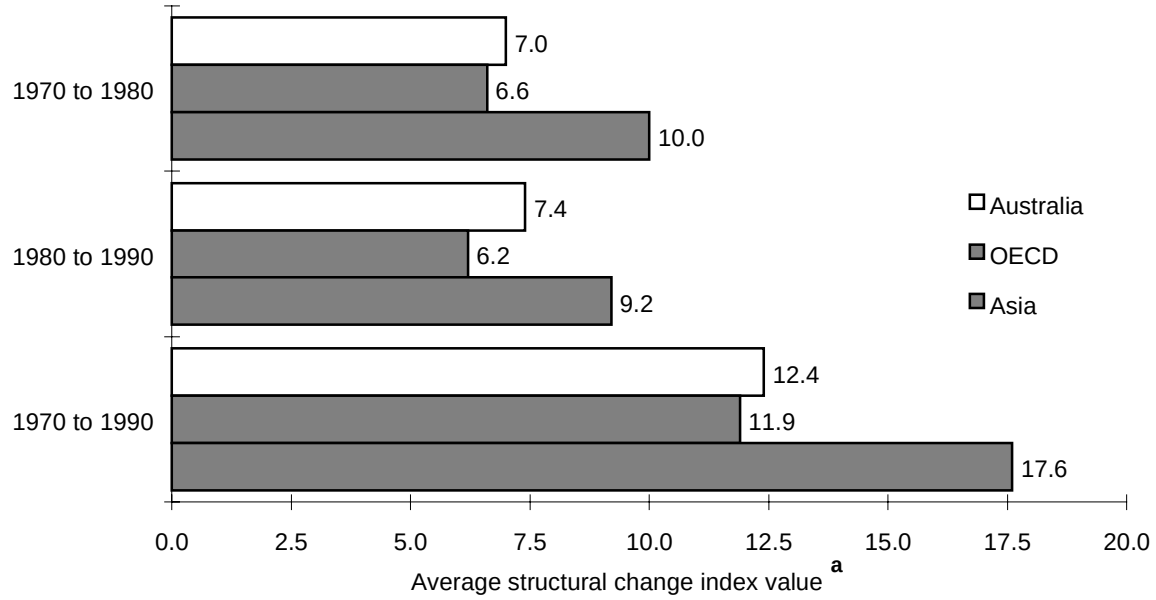
However, since the late 1980s, the relative size of the manufacturing sector has also contracted in most Asian economies — notable exceptions being Indonesia and Thailand.

- Within Australia's manufacturing sector, growth rates of output of different industries have varied considerably.
  - The Food, beverages and tobacco, Paper, paper products and printing, Chemicals, petroleum, rubber and plastics and Basic metal products industries have expanded their output shares.
  - In contrast, the Fabricated metal products and Textiles, clothing and footwear industries declined in relative importance.
  - A number of these trends mirrored similar movements in other OECD countries.
- As with other OECD countries, Australia's agricultural sector has declined in relative importance. However, many Asian countries experienced much larger reductions. Indeed, the agricultural sector's share of GDP in a group of Asian countries fell from an average of some 30 per cent to less than 10 per cent.
- The relative size of mining activity rose in most countries during the 1970s, reflecting higher demand and higher prices for most mineral products. Since the mid 1980s, the mining sector's share of economic activity has tended to fall in most countries, although the fall has been relatively small for Australia.

The extent of structural change — how does Australia compare?

- Between 1970 and 1990, there were considerable differences in the rates of structural change among countries.
  - Based on shifts in output shares between industries, the rate of structural change in Australia was slightly higher during the 1980s than in the 1970s (figure 2).
  - In contrast, the average rate of change across a selection of OECD and Asian countries was slightly lower in the 1980s than in the 1970s.
- In each period, Australia's average rate of structural change was somewhat greater than the average for a selection of 15 OECD countries. In contrast, the average rate of structural change for a group of six Asian countries consistently exceeded that experienced in Australia.

Figure 2 **Australia's structural change compared, 1970 to 1990**



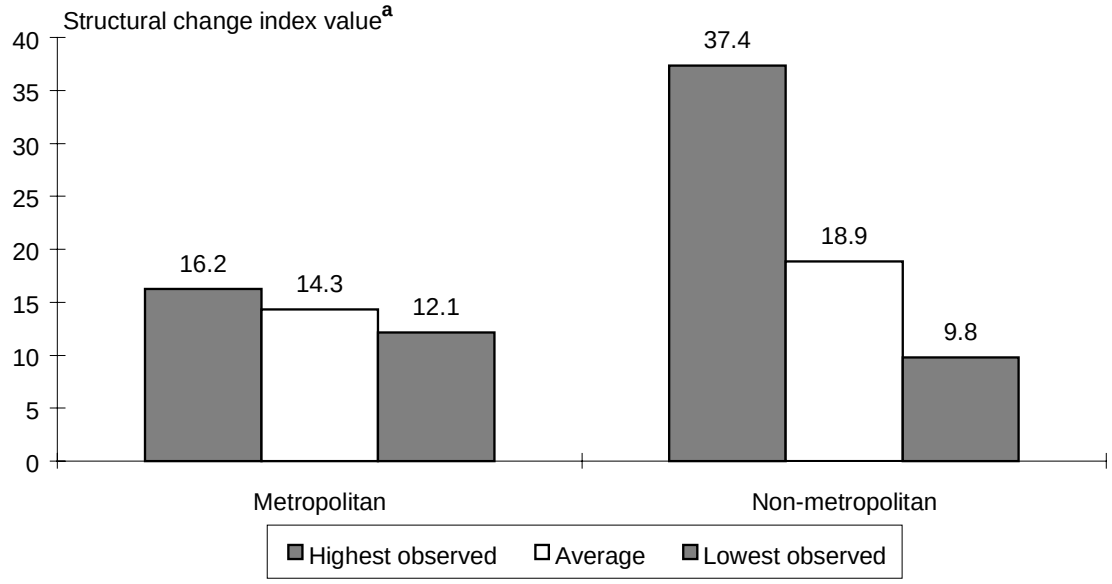
a The index represents a measure of the extent of change in the output shares of a common set of 18 industries for the relevant countries and time periods. Where changes in shares are small, the value of the index is small, indicating that there has been little structural change. Conversely, where changes in shares are large, the index registers a higher value indicating more extensive structural change (see appendix A).

Source: Table 2.1 in main text.

Regional Australia — diverse experiences

- The Commission examined the extent of structural change — based on shifts in employment between industries — across 113 regions throughout Australia for the period 1981 to 1996. A broad comparison of the rates of structural change experienced by Australia's eight metropolitan (or capital city) and 105 non-metropolitan regions is presented in figure 3.
- Structural change indexes provide a useful summary measure with which to compare rates of structural change in employment across regions over time. Where, for example, a region had a structural change index value of 10, based on changes in its industry employment shares between 1981 and 1996, this would mean that 10 per cent of the region's workforce in 1996 would have to be reallocated to different industries to re-establish the employment shares existing in 1981.

Figure 3 **A comparison of rates of structural change across Australia's metropolitan and non-metropolitan regions, 1981 to 1996**



a The index represents a measure of the extent of change in the employment shares of a common set of 60 industries across 113 regions.

Source: Figure 3.1 in main text.

- Each of Australia's metropolitan regions had rates of structural change below the average for non-metropolitan regions (18.9).
  - Overall, the structural change index for these regions averaged about 14 — ranging from a low of about 12 (Perth) to a high of about 16 (Darwin and Melbourne).
  - The relatively low rates of structural change experienced by metropolitan regions mainly reflects their greater size in terms of overall levels of employment and diversity of activity.
- Australia's non-metropolitan regions displayed much greater variation in their rates of structural change — ranging from a low of around 10 (Lower Murrumbidgee in New South Wales) to a high of 37 (Lyell on the west coast of Tasmania). This reflects the typically smaller industry bases of these regions and the tendency for many of them to be highly specialised (often dominated by a few agricultural or mining activities).
- The key drivers of structural change varied between these broad regional groups.
  - Within metropolitan regions, widespread changes in manufacturing employment shares accounted for about 20 per cent of the measured structural change. There were also sizeable changes in services sector

employment, notably in the Finance/business, Community services and Recreational/personal and other services industry groups.

  - Within non-metropolitan regions, the largest single source of structural change was a decline in agricultural employment. Restructuring amongst mineral industries — particularly coal and metallic minerals — also contributed to observed structural change. Overall employment in manufacturing industries across non-metropolitan regions declined only slightly. However, there were marked differences in the pattern of change across manufacturing industries in these regions as a group. Employment increased in some industries (eg Food, beverages and tobacco and Fabricated metals), while declining in others (eg Basic metals and Textiles, clothing and footwear).

- Changes in employment shares at the national level for the services and agricultural sectors were clearly evident across regions.
  - Between 1981 and 1996, the employment share for the services sector increased in 109 of the 113 regions.
  - Over the same period, the employment share for agriculture declined in 88 regions.
- Changes in employment shares for mining and manufacturing displayed much greater variability. The regions experiencing the highest rates of structural change in employment were typically heavily reliant on mining activities. In contrast, regions with a relatively large services sector generally experienced relatively low rates of structural change.
- Between 1981 and 1996, regions with broadly similar rates of structural change had markedly different employment outcomes.
  - Some regions that experienced relatively high rates of structural change had strong employment growth and above-average growth in population and household incomes (eg Dale and Vasse in Western Australia and Far North in Queensland).
  - Other regions that experienced high rates of structural change suffered falls in employment and had slower rates of income growth and more rapid rises in unemployment (eg Whyalla and Flinders Ranges/Pirie in South Australia and Far West in New South Wales).
  - A similar diversity in experience was evident among regions which underwent relatively low rates of structural change.
  - Among these latter regions, many of those with a strong services orientation experienced rapid employment growth (eg Gold Coast in Queensland,

Queanbeyan in New South Wales and Perth in Western Australia), while a number of the more agriculturally-based regions registered declines in employment (eg Hotham-Lakes in Western Australia, North Central Plain in New South Wales and North Wimmera in Victoria).

- An important implication is that high rates of structural change need not mean low or negative rates of employment growth.

Australia's labour market — significant changes

- Australia's labour market has changed considerably since 1970.
- In line with the experience of other OECD countries, job growth in Australia has not kept pace with increases in the supply of labour.
  - As a result, Australia's average unemployment rate has risen sharply — from 3.7 per cent in the 1970s to 7.3 per cent in the 1980s and 8.9 per cent for the 1990s to date.
  - There has also been a significant rise in the average duration of unemployment — from around 2 months in the early 1970s to around a year or more in recent times.
- Reflecting these developments, the proportion of long term unemployed (those unemployed for 12 months or more) in total unemployment, increased from less than 5 per cent in the 1970s to about one-third by 1998. Those over the age of 35 accounted for a growing share of the unemployed, while the proportion accounted for by 15 to 19 year olds has declined.
- The extent of underutilisation of labour (people working fewer hours than they would prefer) and hidden unemployment (those who would like to work, but not formally participating in the workforce) has also increased.
- Structural changes have had a number of distinctive impacts on the supply of labour. Three notable developments have been changes in the participation rates of different categories of the population, changes in work patterns and progressive improvements in the educational attainment of workers. These developments have been shaped by both supply and demand factors.
- While Australia's overall labour force participation rate has increased modestly since 1970, there have been significant changes in the participation rates of some groups.
  - The workforce participation of females, particularly married females, rose strongly, especially from the early 1970s to the mid- to late-1980s.

- In contrast, the participation rates of the young have declined, reflecting increasing retention in secondary and tertiary education and a contraction in full-time job opportunities.
- The participation rates of older workers — notably those over 55 years — have also declined, although most of the decline occurred in the 1970s.

- Work patterns have also changed significantly. In particular, the number of part-time jobs nearly quadrupled between 1970 and 1998, whereas full-time jobs grew by 30 per cent. As a result, the proportion of workers engaged in part-time employment (including casual employees) rose from about 10 to 26 per cent.
- The educational attainment of the workforce has improved significantly over the past two decades.
  - In 1996, about 42 per cent of the working age population held post-school qualifications, compared with 20 per cent in 1971.
  - Over the last decade alone, the proportion of the population with post-school qualifications has increased by over 20 per cent, with the proportion holding degrees increasing by more than 40 per cent.
  - These increases have been driven by growing demands from industry for more skilled workers, reflected in wage/salary premiums and associated higher returns to extra education and training.
- Aggregate employment expanded by over 3 million jobs between 1971 and 1998, an increase of almost 55 per cent. While employment in services industries rose by around 3.3 million, there were absolute declines in employment in manufacturing and mining, and a slight increase in the agricultural sector.
  - Over 95 per cent of employment increases were concentrated in five industries: Community, education and personal services; Finance, property and business services; Wholesale and retail trade; Construction; and Public administration and defence.
  - Five industries accounted for over 95 per cent of the employment declines: Transport equipment and machinery; Textiles, clothing and footwear; Metallic products; Electricity, gas and water; and Food, beverages and tobacco.
- Increases in competitive pressure and advances in technology have provided greater incentives for improved usage of capital and other inputs (including labour).
  - Firms have responded by changing their work and production scheduling arrangements, reducing their stockholding requirements and using new techniques to lift their productivity.

- Across most industries, the combined outcome of these responses has been a rise in the amount of capital employed per worker.

- Job turnover and mobility rates for the Australian labour market suggest that the equivalent of the entire labour force finds a new or different job every four to five years.
  - Aggregate job turnover rates have declined slightly since 1972. Most job movers seek work within their existing industry and occupational groups.
  - Nevertheless, there are sizeable movements between industries and occupational groups. For example, in the twelve months ending February 1998, about 40 per cent of job movements involved shifts between firms in different industries and over one-third of job movements involved shifts between occupational groups.
  - Mobility rates are consistently lower for workers over the age of 35, those with non-English speaking backgrounds and lacking post-school qualifications. This suggests that people in these groups are likely to find it more difficult to recover from job losses arising from structural change than others.

- In summary, structural factors have been responsible for significant changes within Australia's labour market since 1970.
  - They have influenced the number of people making themselves available for employment and the number and types of jobs available. Job growth has not been sufficient to absorb the increase in the supply of labour, so that unemployment and underemployment have increased considerably.
  - Beyond this, different patterns of growth across the economy have influenced the demand for particular skills. The composition of the workforce and opportunities for entering or moving between occupations and industries have changed and had differential effects within the workforce.

1 Introduction

Australia has seen considerable change in the structure of its economy over the last three decades, and will experience more in the future. This reflects the interaction of a wide variety of natural, social and economic forces which are continuously at work within our economy. Some of the more visible outcomes — resource shifts between industries and regions and the development of new products and processes — are inherent features of a growing economy. They are linked to the dynamics of competition which rewards those producers most able to satisfy consumer demands.

The influence of some of the internal and external forces that affect the size, composition and operation of the Australian economy — such as droughts, floods and fluctuations in activity associated with the business cycle — tend to be short term in nature (even if recurring). Others are more enduring (and often less visible), creating underlying pressures for change of a more permanent nature. At any point in time, changes in the economy reflect the interplay of short term as well as longer term influences. The longer term changes — which are often referred to as 'structural change' — are the focus of this report.

The main sources of pressure for structural change can be grouped into two categories — those arising from market-related developments and those triggered by government policies. Examples from each category are provided in box 1.1.

Structural changes arising from these sources typically have differential impacts on the community — bringing new opportunities and benefits to some firms, industries, workers and regions, but imposing costs on others. These costs essentially reflect adjustment pressures arising from the process of structural change. While much adjustment takes place without causing undue difficulties, adjustment problems can and do occur.

Governments can play a role in assisting communities to manage the adjustment process and deal with the losses in income or employment that might be associated with it. These adjustment and related distributional issues have been discussed in a variety of Australian studies in the past (eg Crawford 1979; IAC 1977a, 1977b) and more recently (eg Argy 1998; Borland 1998; IC 1993, 1997).

Box 1.1 **Sources of pressure for structural change**

The main *market-related sources of structural change* (and related examples) are:

- **Technological change** such as advances in microelectronics, information and communication technology, new materials technology, biological technology, robotics and energy-related technologies;
- **Behavioural changes** which have accompanied changes in income and its distribution, demographic changes and changing tastes (eg increased demand for recreation and entertainment services and low fat foods and exercise equipment consistent with more health conscious lifestyles);
- **Trade and global specialisation** associated with the emergence of new export markets and increased competition from imports associated with the rapid industrial development of many Asian economies; and
- **Resource discovery and depletion** such as the development of mineral resources and the degradation of land in various regions due to soil erosion and salinity.

The main *government-related sources of structural change* (and related examples) are:

- **Trade and investment liberalisation** involving unilateral reductions in tariff and non-tariff barriers to trade, reform of statutory marketing arrangements and multilateral actions to liberalise trade and investment regimes;
- **Infrastructure and general government reforms** involving initiatives to commercialise, corporatise and privatise public utilities, remove regulatory barriers to entry, and separate different segments of infrastructure to promote competition. In the case of general government activities, reforms have promoted improved productivity, competition and an outcomes-oriented approach to service delivery (eg financial management reforms, better targeting of services and payments and competitive tendering);
- **Labour market reforms** which have focused on making greater use of market mechanisms to determine wages and conditions (eg enterprise bargaining), reforms to labour market assistance programs and reforms to workers compensation and occupational health and safety legislation;
- **Competition and other regulatory reforms** involving changes to restrictive trade practices and price monitoring legislation, reforms to regulatory processes and moves to promote competition — such as through the National Competition Policy framework; and
- **Taxation reforms** covering initiatives to broaden the income tax system (eg the introduction of fringe benefits and capital gains taxes) and improve the operation of the corporate tax system (eg dividend imputation, changes to depreciation regimes and the removal of tax exemptions from activities such as gold mining).

However, there are differing views on the role that governments should and can play in the adjustment process. For instance, should governments seek to:

- manage the pace of change (eg by deferring changes to government policies or slowing down the rate at which policies are modified)?
- enhance the community's capacity to adjust (eg through measures designed to facilitate retraining and relocation)? and/or
- compensate individuals and groups in the community that lose as a result of change (eg through measures such as income supplements and capital grants)?

In addition, where governments become involved in the adjustment process, practical issues arise concerning the design and delivery of adjustment programs that are compatible with broader efficiency and equity objectives.

Improving our knowledge of the sources, mechanisms and effects of change within an economy can aid the development of better measures for addressing the dislocations and adjustment problems that change can bring. The Commission is currently undertaking research in this important area.

This report explores the dimensions and impacts of structural change that have occurred in Australia since the early 1970s. The main areas of analysis include:

- the broad direction and extent of structural change that has occurred in Australia relative to other countries since 1970 (chapter 2);
- the extent and nature of structural changes affecting regions across Australia and the links between these changes and regional performance (chapter 3); and
- developments that have affected the size, structure and performance of Australia's labour market, focussing on factors underpinning changes in the supply and demand for labour and patterns of labour mobility (chapter 4).

Appendixes A through C present information and data that complements the key areas of analysis in the report.

2 Australia in an international context

As in other countries, the Australian economy has witnessed considerable changes in its industry composition, employment and investment over the past few decades. Agricultural activities have become less important over time, while output and employment in the services sector have expanded considerably. Declines in manufacturing output and employment have been greater in Australia than those recorded by other OECD countries. In the newly industrialised Asian economies, the manufacturing sector expanded in relative terms over the seventies and most of the eighties, but has since followed the declining trend evident in the mature industrialised countries.

The average rate of structural change in output for Australia during the 1980s was slightly higher than that experienced in the 1970s. Since 1970, Australia's rate of structural change has exceeded the average for a group of 15 OECD countries. But some countries in our region, including New Zealand and many of our Asian trading partners, have faced higher rates of structural change than Australia.

This chapter examines the broad direction and extent of structural changes that have occurred since the early 1970s and compares Australia's experience with that of other countries. The focus is on output changes, with a brief overview of changes in investment and employment shares.

Section 2.1 examines changes in the relative sizes of the different sectors across a range of countries. Variations in the rate of structural change since 1970 are discussed in section 2.2.

2.2 The direction of structural change

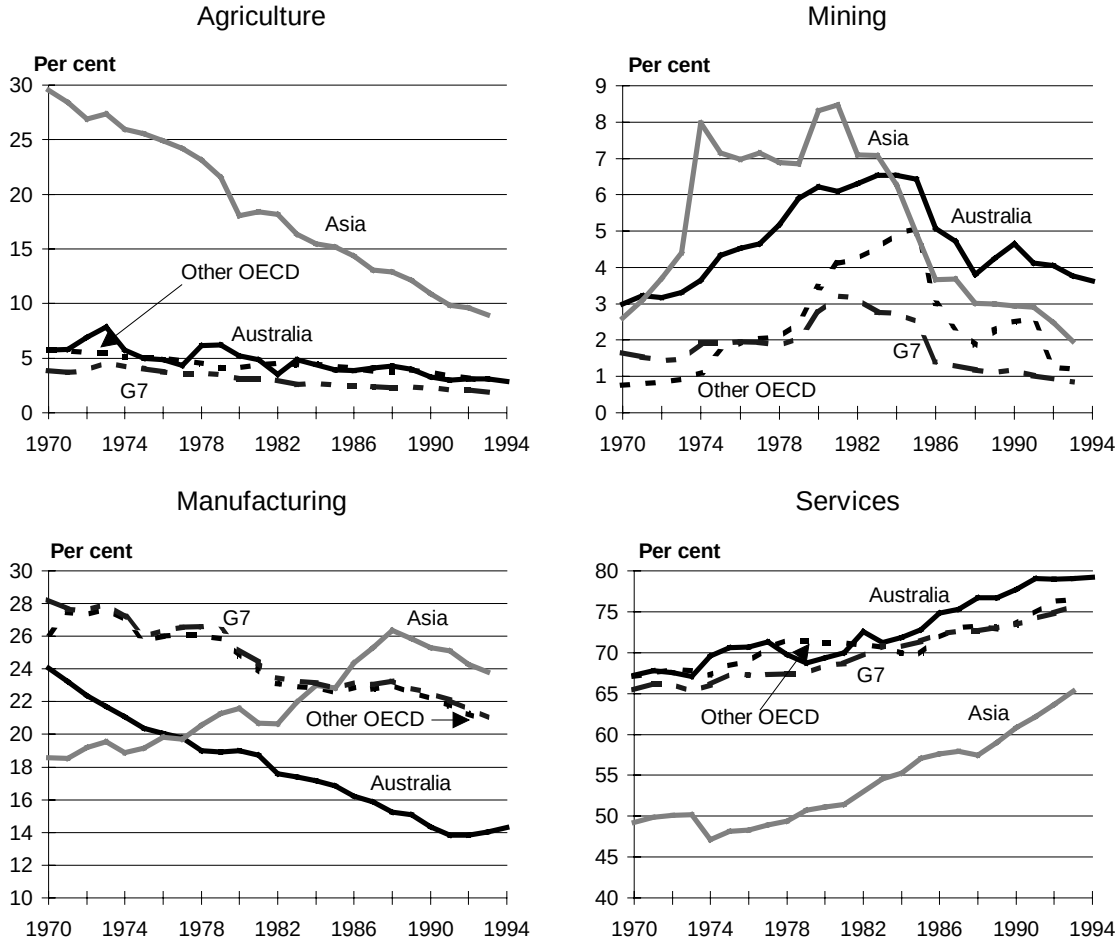
This section presents international comparisons of the direction and extent of structural change over the period 1970 to 1994 using a few key indicators. The focus is on a comparison at the sectoral level (ie agriculture, mining, manufacturing and services), with some analysis at a broad industry level for two key sectors — manufacturing and services. Supporting comparative data are presented in appendix A, although comparisons across countries are constrained by the depth of coverage and data availability.

Changes in the relative size of sectors

A common and enduring feature of economic development in industrialised countries has been the decline in the share of output accounted for by the manufacturing and agricultural sectors, in the face of strong services sector growth (figure 2.1).

In 1970, Australia had relatively large agricultural and mining sectors, but a small manufacturing sector compared to many industrialised OECD countries. In the 1990s, this continues to be the case, but there have been some important changes over time.

Figure 2.1 **Sector shares of GDP, selected countries, 1970 to 1994[a]**
Measured in current prices



a Shares are based on valued-added data in current prices converted to US$ using annual average exchange rates. The G7 group of countries comprises: United States; Canada; Japan; France; Germany (West); Italy; and the United Kingdom. Other OECD is comprised of the following smaller OECD countries: New Zealand; Belgium; Denmark; Finland; Netherlands; Norway; and Sweden. Asia comprises the following countries: Hong Kong; Indonesia; Korea (Republic of); Philippines; Singapore; and Thailand.

Data sources: PC estimates based on data from: SNZ Economics Database; World Bank Tables; OECD (1996c); UN (various years); UNIDO (1995, 1997).

In line with the OECD experience, Australia's agricultural sector has continued to decline in relative importance. However, the declines experienced by Australia and other OECD nations were generally far smaller than the declines in the agricultural sector in many Asian countries. As shown in figure 2.1, the agricultural sector's share of GDP in a group of Asian economies fell from an average of about 30 per cent to around 9 per cent between 1970 and 1993.

Throughout the OECD and the newly industrialising East Asian economies, the significance of the mining sector increased over the 1970s in response to higher commodity prices and strong growth in demand for many mineral commodities. However, mining's share of economic activity fell sharply in most economies around the mid-1980s, and then declined steadily over the rest of the period to return to levels that existed in the early 1970s.

Amongst OECD countries, the manufacturing sector's share of GDP has fallen since 1970, although at varying rates. The rate of decline accelerated in the early 1980s and again in the early 1990s. In contrast, the GDP share of Australia's manufacturing sector decreased at a relatively rapid rate between 1970 and 1992, but subsequently increased slightly. (While not shown in the figure, since 1996, manufacturing's share has fallen slightly.)

In contrast to the OECD nations, manufacturing's share of GDP in many Asian economies grew rapidly through the 1970s and most of the 1980s. This contributed to the slower growth of some Australian manufacturing industries, including textiles, clothing and footwear and whitegoods, as imports from these countries captured a growing share of domestic sales. However, in the newly industrialising Asian economies, except Indonesia and Thailand, there has been a strong reversal of trend, with the share of manufacturing in total output declining since the late 1980s.

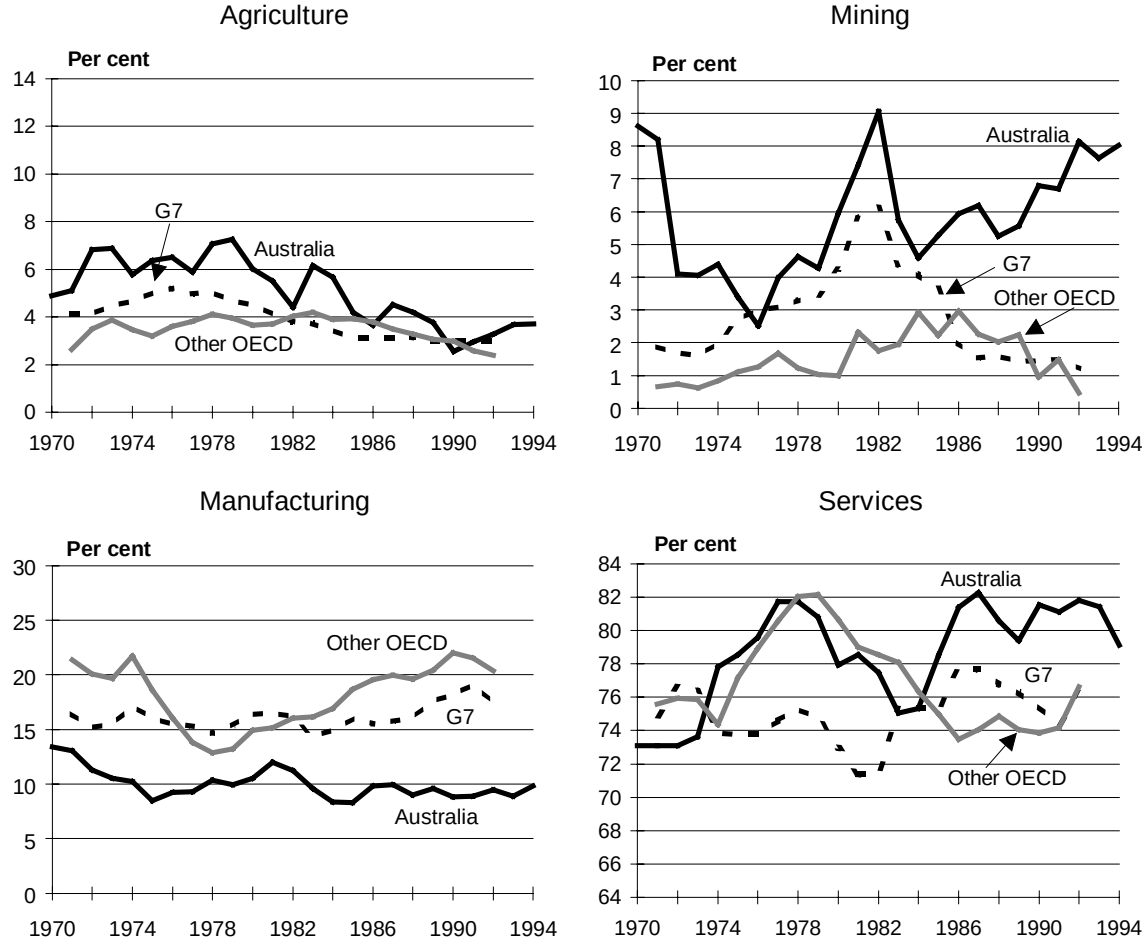
Services, which comprise the largest sector in the OECD and Asian economies, increased their relative importance between 1970 and 1994. Australia's services sector has been relatively large by OECD standards (figure 2.1). Between 1970 and 1994, the sector experienced higher growth than most other OECD countries. The services sector grew much faster in the selected Asian economies, although it remained much smaller in relative terms than in OECD countries. Much of the services sector growth in Asia came from the Construction and Financial services industries, although both industries are currently undergoing significant rationalisation.

Over the past few decades, there has been a general decline in the share of investment (particularly public sector investment) to GDP throughout the OECD (OECD 1993, 1996a). Australia has also followed this trend. Between 1970-71 and

1994-95, investment as a proportion of Australia's GDP declined from around 25 to 19 per cent. However, Australia's investment to GDP ratio remains relatively high compared to the average for the OECD. This is partly an outcome of Australia's relatively high population growth and our more capital-intensive industry structure (EPAC 1995). These factors have also contributed to Australia's differing sectoral investment patterns over time.

Figure 2.2 shows the changing patterns of sectoral investment shares in Australia and other OECD countries. (Data were not available for the selected Asian countries.) The figure indicates that sectoral investment patterns have been more variable than those of output over time. There is also more diversity in investment patterns between Australia and the rest of the OECD, particularly the smaller OECD

Figure 2.2 **Sector shares of investment, selected countries, 1970 to 1994[a]**
Measured in current prices



a Shares are based on gross fixed capital formation data which have been converted to US$ using annual average exchange rates. The G7 group of countries comprises: United States; Canada; Japan; France; Germany (West); Italy; and the United Kingdom. Other OECD is comprised of the following smaller OECD countries: Belgium; Denmark; Finland; Netherlands; Norway; and Sweden. New Zealand was excluded due to lack of comparable data over the period. Data on investment were unavailable for the Asian economies.

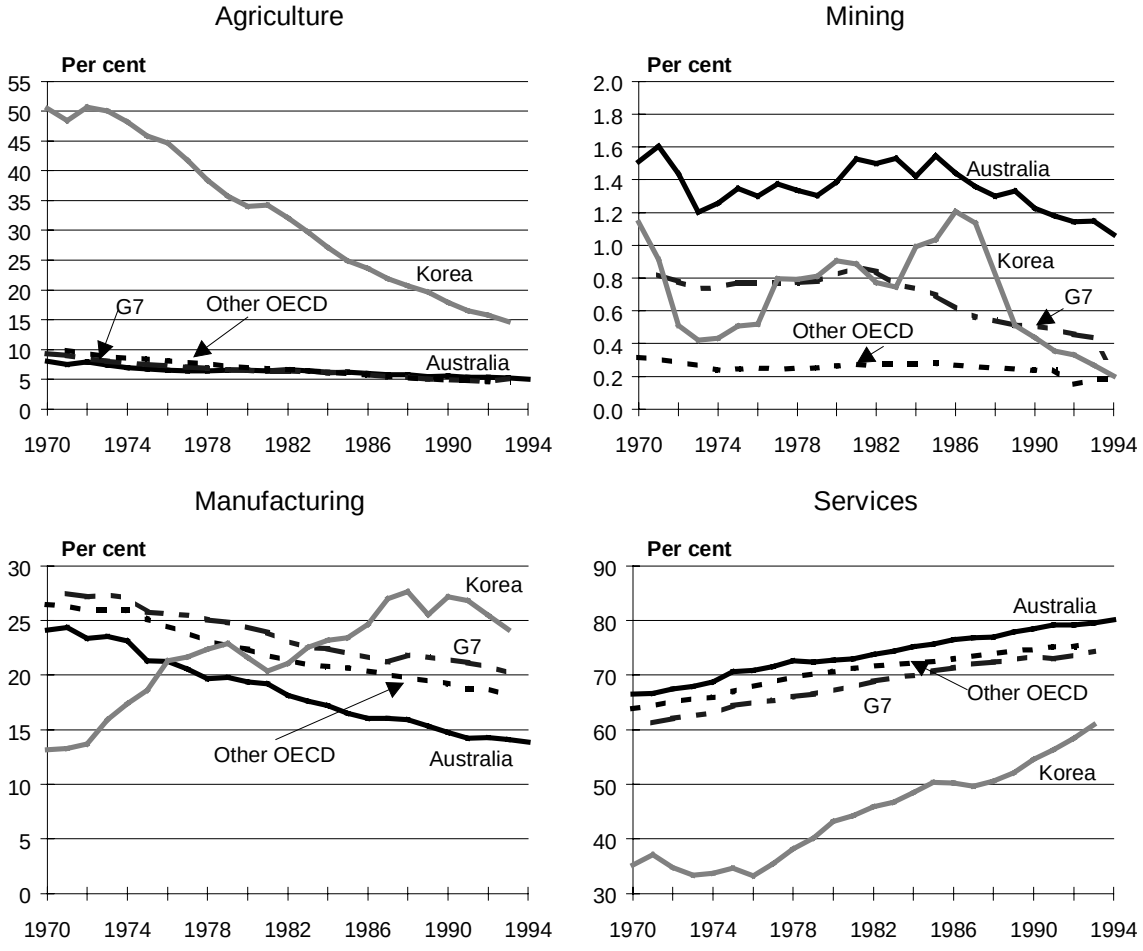
Data sources: PC estimates based on data from: OECD (1996c); UN (various years).

economies. The share of investment directed to the Australian mining sector, for example, continued to rise beyond the mid-1980s when it was beginning to decline across the OECD countries more generally. Manufacturing's share of investment in Australia has remained relatively stable while, in the OECD, there has been a resurgence of manufacturing investment over the latter part of the 1980s. Instead, Australia's investment spending has been increasingly directed towards the services sector, particularly in the Financial services and Community and public services industries (see appendix A for details).

Sectoral shares of employment in Australia, on the other hand, have followed a similar pattern to changes in output and have been largely consistent with changing employment patterns throughout the OECD and Korea[1] (figure **2.3**).

[1] Comprehensive employment data by industry were not available for the other Asian countries over the period 1970 to 1994.

Figure 2.4 **Sector shares of employment, selected countries, 1970 to 1994[a]**



a The G7 group of countries comprises: United States; Canada; Japan; France; Germany (West); Italy; and the United Kingdom. Other OECD is comprised of the following smaller OECD countries: New Zealand; Belgium; Denmark; Finland; Netherlands; Norway; and Sweden. A consistent data series was not available for the Asian countries, except for Korea (Republic of).

Data sources: PC estimates based on data from: OECD (1996c); UN (various years); UNIDO (1995, 1997).

These data, however, mask many important employment and occupational changes within and between sectors. For Australia, these changes are discussed more fully in chapter 4.

The process of structural change does not just involve resource flows between sectors. A considerable amount of structural change occurs in response to resource flows between industries within sectors. This aspect of structural change is taken up in the next subsection, which looks at structural change within the manufacturing and services sectors.

Structural changes within the manufacturing and services sectors

Together, the manufacturing and services sectors account for the overwhelming bulk of output and employment within advanced industrial and newly industrialising countries. For example, in 1993, the combined output shares of these sectors accounted for about 95 per cent, on average, of the GDP of OECD economies. Whilst there has been a general decline in the relative size of the manufacturing sector and a general increase in the relative size of the services sector in these countries since 1970, there have been considerable differences in the experiences of individual industries within these sectors. These divergent experiences are examined below.

Manufacturing

The composition of Australia's manufacturing sector continues to reflect Australia's strengths as a natural resource-based economy. Between 1970 and 1990, industries such as: Food, beverages and tobacco; Paper, paper products and printing; Chemicals, petroleum, rubber and plastics; and Basic metal products increased in size relative to other manufacturing industries (figure **2.5**). In 1970, the combined value-added of these industries represented 46 per cent of the manufacturing total, compared to 54 per cent in 1990. Fabricated metal products, while still the dominant industry in the sector in terms of value-added (29 per cent in 1990), declined relative to other manufacturing industries, as did the Textiles, clothing and footwear (TCF) industry.

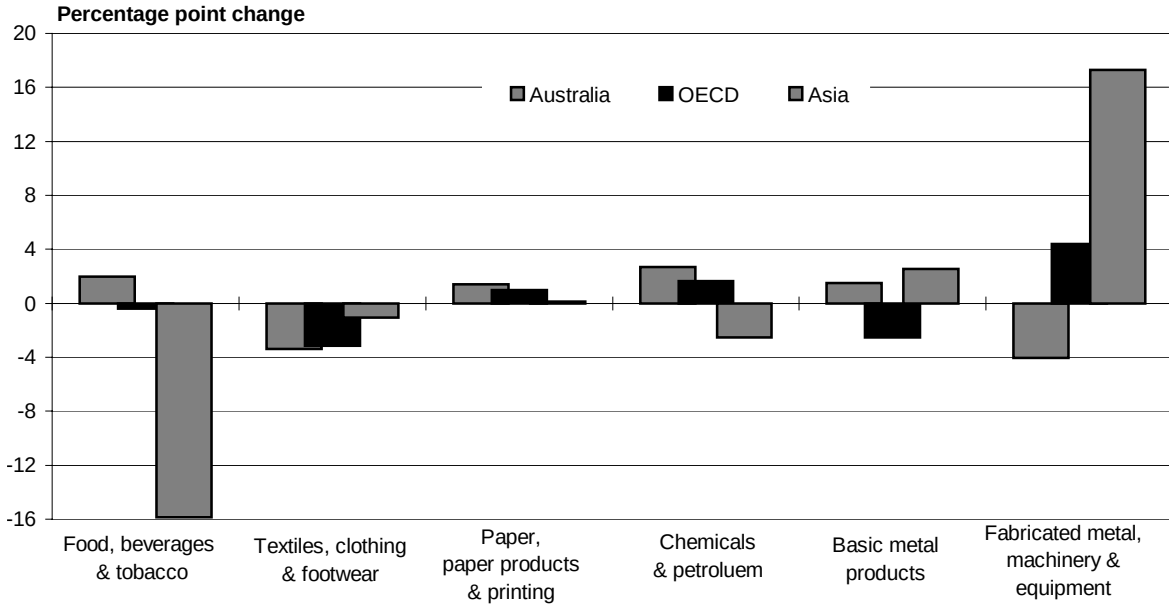
The features of Australia's manufacturing industry structure and the changes that have occurred are typical of other natural resource-based economies such as New Zealand and Canada (see appendix A). In terms of growth between 1970 and 1990, the main divergence between Australia and the other OECD countries is in the metal products groups (figure **2.6**). In Australia, Basic metal products' (eg steel and aluminium production) share of manufacturing value-added grew, while the share for Fabricated metal products declined. In the major OECD countries, the opposite has occurred.

In Australia and other OECD countries, value-added shares — and particularly employment shares — have generally declined more rapidly in labour-intensive activities, such as TCF. For example, the production of textiles and clothing (the most labour-intensive component of the TCF industry) has been shifting to developing countries (mainly countries in Asia), which now supply more than half of the world's exports of clothing and a third of global textile exports, double their shares in the late 1960s (Anderson 1992). In other OECD countries, the same trend is also apparent in other simple manufactures (eg basic metals).

Changes in the structure of the manufacturing sector in the Asian group of countries have been appreciably greater than in the OECD countries (figure **2.8**). Since 1970, Food, beverages and tobacco has declined considerably relative to other Asian industries in the manufacturing sector. In aggregate, the relative importance of the TCF and Chemicals and petroleum industries has declined, although only slightly. This masks some quite different outcomes across the Asian countries. For instance, in Thailand, the Philippines and Indonesia, the TCF industry increased its share of

Figure 2.7 **Changes in the composition of the manufacturing sector in Australia, selected OECD[a] and Asian countries[b], 1970 to 1990[c]**

Percentage point change in the industry share of manufacturing value-added



a The OECD comprises a selection of these countries, namely: United States; Canada; Japan; France; Germany (West); Italy; the United Kingdom; New Zealand; Belgium; Denmark; Finland; Netherlands; Norway; and Sweden. **b** Asia comprises the following countries: Hong Kong, Indonesia; Korea (Republic of), the Philippines; Singapore; and Thailand. **c** The figure only includes manufacturing industries that experienced a change in their value-added share of manufacturing of 1 percentage point or more between 1970 and 1990. These industries account for between 89 to 92 per cent of manufacturing output in Australia, the selected OECD and Asian countries.

Data sources: PC estimates based on data from: SNZ Economics Database; World Bank Tables; OECD (1996c); UN (various years); UNIDO (1995, 1997).

manufacturing output over the period 1970 to 1990. Similarly, the share of the Chemicals and petroleum industry declined only in Hong Kong and Singapore. Overall, the Food, beverages and tobacco; TCF; and Chemicals and petroleum industries remain relatively important to the Asian economies, together accounting for around a half of all manufacturing output.

Reflecting relatively rapid development in Asia, higher value-added industries such as automotives and other industries within the Fabricated metal products group have increased their share of total manufacturing output.

Services

Despite the strong overall growth of the services sector throughout the OECD and Asian economies between 1970 and 1990, the growth experiences of individual industry groups within the sector have varied considerably, resulting in extensive structural changes (figure **2.9**).

In Australia, finance, insurance and business services have grown rapidly, particularly since financial deregulation in the early eighties. They increased their share of the services sector by just over 8 percentage points over the period 1970 to 1990. Expansion of these industries across the OECD as whole has been considerably less than in Australia.

Part of the rapid growth of finance, insurance and business services is due to increased contracting out of these services by firms in other industries. While this trend partly reflects cost considerations, it also reflects the growing diversity and complexity of business arrangements, which has increased demand for specialist business and financial advisory services.

Community and public services also increased their share of the services sector relative to other service industries throughout the OECD region. This growth resulted from increased private sector activity, while the share of public administration declined by an average of about 1.5 percentage points. It is common to see a higher share of income devoted to community, leisure and personal services as economies become wealthier. Yet, despite rapid increases in income in many of the East Asian economies, this component of the services sector in these economies has contracted slightly relative to other services.

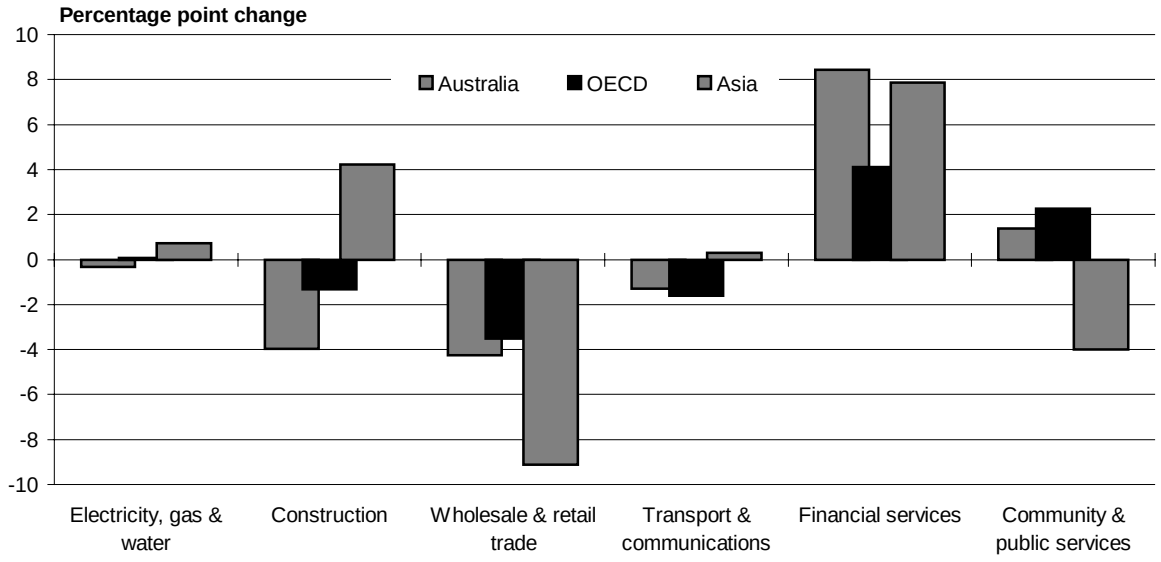
A feature of the changes within the services sector throughout the OECD has been the slow growth, or relative decline, of utility services such as Electricity, gas and water; and Transport and communications services. This, in part, reflects technological advances, which have contributed to lower real prices for these services, notably in the Transport and communications areas. Infrastructure reforms have also contributed to rationalisation of these services. In the Asian economies, on the other hand, utility services have increased slightly, as these countries continue to expand and modernise their infrastructure services.

Construction services also expanded rapidly in the Asian economies in line with their rapid development and growth in the period to the mid-1990s. In contrast, Construction services have declined as a share of the services sector in the mature OECD countries, particularly in Australia.

Across all countries, a common feature of the structural changes occurring in the services sector has been the relative decline of the Wholesale and retail trade industries. These services, while growing more slowly than other services, remain a

Figure 2.10 **Changes in the composition of the services sector in Australia, selected OECD[a] and Asian countries[b], 1970 to 1990[c,d,e]**

Percentage point change in the industry share of services value-added



a The OECD comprises a selection of these countries: United States; Canada; Japan; France; Germany (West); Italy; the United Kingdom; New Zealand; Belgium; Denmark; Finland; Netherlands; Norway; and Sweden. **b** Asia comprises the following countries: Hong Kong, Indonesia, Korea (Republic of), the Philippines; Singapore and Thailand. **c** Wholesale and retail trade includes restaurants and hotels. **d** Financial services includes finance, insurance and business services. **e** For the purposes of comparability, data for Community and personal services, Public administration and Other Producers have been combined to create Community & public services.

Data sources: PC estimates based on data from SNZ Economics Database; World Bank Tables; OECD (1996c); UN (various years); UNIDO (1995, 1997).

significant core of activity within the sector — accounting for around a quarter of all services sector value-added.

2.3 Variations in the rate of structural change

There has been concern expressed within Australia in recent years that the speed of structural change has been accelerating, and that this is accentuating adjustment problems. Consequently, this section examines summary measures of the overall extent and rate of structural change since 1970.

Structural change indexes

A standard approach for measuring structural change is to derive structural change indexes (SCIs) to facilitate comparisons between countries and over time. SCIs are derived by adding half the sum of the absolute value of changes in the percentage shares of output (or employment) of different industry groups for a given period. This provides a measure of the extent to which industries are growing at different rates, which results in compositional shifts — that is, structural change. Where changes in shares are small, the value of the index is small, indicating that there has been little structural change. Conversely, where changes in shares are large, the index registers a higher value indicating more extensive structural change.

SCIs do not measure changes in the overall level of activity or employment — the index would be zero if all industries were growing (or declining) at the same rate. Any changes in the output or employment shares of the different industries used to compile the SCIs reflect the 'net' impact of the many influences on the composition of output and employment — some of which pull in different directions. For example, increases in demand for some of the products of a particular industry group may be offset by reductions or slower rates of demand growth for other products of the same industry group.

SCIs are sensitive to a number of factors, such as the level of aggregation underlying the industry classification used and, in the case of output measures, whether output is measured in current or constant price terms. SCIs are also sensitive to short term cyclical fluctuations over the business cycle (box 2.1). To overcome this problem, the SCIs presented later in this section are based on industry shares averaged over a four year period. For detailed information on measuring SCIs and the data used to compile the indexes reported in this chapter, see appendix A.

Box 2.1 **Measuring structural change — some additional observations**

SCIs are influenced by three important factors: the classification of industries used, the time period selected for the analysis and whether current or constant price measures of output are used. Analysis and interpretation of SCIs should reflect an understanding of these influences.

The industrial classification used. The classification used to measure output for different industry groups affects the calculation of the SCIs. In general, the more detailed the classification, the more structural change is likely to be observed. The SCIs reported in this chapter use 18 broad industry groups that are comparable across countries. This level of aggregation may hide some important changes that occur within industries. For example, increases in demand for some of the products of a particular industry group may be offset by slower growth in demand for other products of the same industry group.

The time periods used. SCIs tend to be sensitive to cyclical fluctuations in industry activity levels. For example, year-to-year comparisons tend to exhibit considerable variability reflecting the influence of temporary factors that obscure the influence of longer term changes (see figure 2.6). To overcome this problem, it is best to make comparisons over a long time frame (say 10 years) using data at similar points in the business cycle. However, business cycles tend to vary from country to country. Consequently, the SCIs presented in this chapter are based on industry shares averaged over four years at the beginning and end of the relevant time period to provide a better guide to 'structural' as distinct from 'cyclical' change.

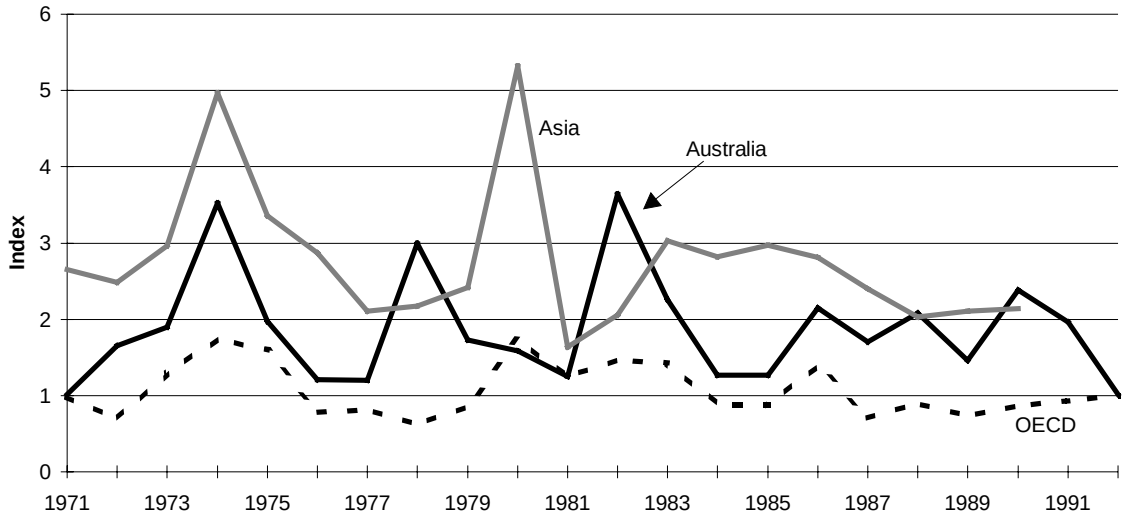
Current or constant price comparisons. Measures of changes in output shares using current as opposed to constant prices can produce different outcomes and assessments. SCIs measured using current price output data show compositional shifts emanating from both price and volume changes, providing a net measure of compositional change. In contrast, constant price measures seek to focus on changes in the volume or quantity of output in response to changes in relative prices — an important determinant of structural change. This provides a useful guide to how industries respond to changes in their relative productivity levels. Both measures can provide valuable information about structural change. However, due to data constraints, the SCIs presented in this chapter are based on data measured in current prices.

Changes in Australia, OECD and Asia

An indication of short term changes in output shares between 1971 and 1992 is provided by the results presented in figure **2.11**. The figure reports year-to-year changes in industrial composition for Australia and a selection of OECD and Asian countries (see table A.1, appendix A).

Figure 2.12 **Index of structural change in Australia, selected OECD[a] and Asian countries[b], 1971 to 1992**

Based on industry value-added shares



a Based on industry shares of value-added for the selection of OECD countries reported in table 2.1. **b** Based on industry shares of value-added for the selection of Asian countries reported in table 2.1.

Data sources: PC estimates based on data from: OECD (1996c); SNZ Economics Database; UN (various years).

The figure indicates that there has been considerable variations in the degree of change over the period, with the group of Asian countries and Australia experiencing much greater year-on-year change than the OECD group of countries. The 1970s were a particularly turbulent period, with most countries experiencing more volatile changes than in later years. The impact of the two oil price shocks in the 1970s, including the commodity price boom of 1973-74, is clearly evident in the figure. The peaks in the index for Australia in 1982 and 1990, reflect the effects of economic recessions.

A longer term view of structural change

Year-to-year comparisons of structural change are sensitive to short term cyclical fluctuations in activity. For this reason, an examination of trends in SCIs over a period of time provides a better guide to the influence of longer term factors on the composition of activity in an economy.

Table **2.1** presents SCIs for Australia and a number of OECD and Asian countries. Comparison of the estimated SCIs indicates that the longer term structural change

experiences of countries have been quite different. The data suggest that, on average, the smaller OECD countries, including Australia, have experienced more structural change than the larger OECD countries. Over the period 1970 to 1990, the

Table 2.2 **Index of the rate of structural change, 1970 to 1990[a]**

Percentage point change based on industry value-added shares

Country	*1970–80*	*1980–90*	*1970–90*
Australia	7.0	7.4	12.4
New Zealand	6.7	9.3	15.9
United States	2.9	5.7	9.0
Canada	4.4	5.1	8.0
Japan	6.9	4.8	11.3
France	6.3	5.6	13.0
Germany	6.6	5.0	13.3
Italy	5.1	6.6	11.1
United Kingdom	5.5	7.8	9.7
Major OECD[b]	5.4	5.8	10.8
Belgium	7.7	6.1	12.1
Denmark	7.2	3.9	11.7
Finland	5.0	5.9	10.2
Norway	11.5	8.2	19.5
Netherlands	10.1	7.8	12.5
Sweden	5.8	4.4	8.6
Small OECD[c]	7.6	6.6	12.9
OECD average[d]	6.6	6.2	11.9
Hong Kong	7.5	10.0	14.7
Indonesia	19.4	11.3	21.3
Korea	10.5	10.3	26.2
Philippines	8.5	6.6	8.2
Singapore	9.5	7.6	19.1
Thailand	4.5	9.3	16.1
Asia[e]	10.0	9.2	17.6
All countries[f]	7.5	7.1	13.5

a SCIs are based on valued-added data in current prices converted to US$ using annual average exchange rates. The SCIs are based on value-added shares averaged over four years at the beginning (eg 1970–73) and end (eg 1977–80) of each period (eg 1970–80). The SCIs take into account changes in value-added shares across the 18 industry groups reported in appendix A. **b** Simple average values for a selection of major OECD countries: United States; Canada; Japan; France; Germany (West); Italy; and the United Kingdom. **c** Simple average values for a selection of small OECD countries: Australia; New Zealand; Belgium; Denmark; Finland; Netherlands; Norway; and Sweden. **d** Simple average values for the OECD countries represented in the table. **e** Simple average values for a selection of Asian countries: Hong Kong; Indonesia; Korea (Republic of); Philippines; Singapore; and Thailand. **f** Simple average values for all the countries in the table.

Sources: PC estimates based on: OECD (1996c); SNZ Economics Database; UN (various years).

smaller OECD nations experienced almost 20 per cent more structural change than the larger OECD countries. Amongst the 15 OECD countries covered in table 2.1, Australia fell into a group of seven countries that experienced above average rates of structural change over this period.

Countries close to Australia, including New Zealand and many of our Asian trading partners, experienced relatively rapid rates of structural change. For example, the average rate of structural change for the Asian countries was almost 50 per cent greater than those of the selected OECD countries over the period 1970 to 1990. In Korea and Indonesia, the rate of structural change was, at times, over double that of the OECD countries.

While the average rate of structural change was relatively high in the Asian countries, for some countries it has slowed over time. In Japan and Indonesia, this slow-down has been quite considerable. On the other hand, in Australia and New Zealand there has been an increase in structural change during the eighties compared with the seventies, although in Australia's case the increase was only small. The United Kingdom, Italy and Finland and the North American countries also experienced more change during the eighties than in the seventies. In the United States, for instance, the estimated rate of structural change almost doubled between the 1970s and 1980s. Overall, however, the United States experienced relatively little structural change over the last two decades compared with most other countries in table 2.1.

3 Structural change across Australia's regions

Differences in the concentration and nature of economic activity across Australia have affected the way pressures for structural change have impacted on people living in different regions. In general, rates of structural change in employment have been higher and more varied in non-metropolitan regions, particularly those with a reliance on mining-related activities.

There is considerable diversity in the characteristics of regions with high rates of structural change. Some have enjoyed strong growth in population, employment and income, while others experienced declines in employment, slower income growth and more rapid rises in unemployment. Similar variability in outcomes was observed for the more structurally stable regions. A number of the more agriculture-dependent regions experienced steady declines in employment. In contrast, many service-based regions achieved rapid employment growth.

The previous chapter described how structural change has affected the industrial composition of the Australian economy as a whole. However, the uneven distribution of economic activity across Australia means that structural pressures can have very diverse impacts at a regional level. This chapter looks at how structural change in employment has affected Australia's regions.

Section 3.1 presents a snapshot of some distinctive features of Australia's regional landscape. Comparisons of the structure and adjustment experiences of metropolitan and non-metropolitan regions are discussed in section 3.2. Section 3.3 examines differences in structural change across regions and its relationship to the size and industry mix of regions. Links between rates of structural change and regional performance are examined in section 3.4.

The analysis is based on a break-up of Australia into 113 regions — derived as a modified amalgam of the 194 statistical subdivisions (SSDs) used in the ABS Census of Population and Housing. Comparable data for these SSDs were available for the period 1981 to 1996. Apart from some aggregation to deal with changes to the classification over time, the major modification was that SSDs in each capital

city were aggregated to form eight capital city 'regions'. This was done to reduce the complications that arise where people live in one area yet work in another — a situation that can result in highly misleading statistics on employment composition and growth. This approach yields regional units for the capital cities that are closer to the notion of a 'local labour market' as defined by the Department of Employment, Education, Training and Youth Affairs — geographical areas within which individuals residing in a particular region typically commute to work or search for jobs (DEETYA 1997).

Further information on the regional classification used and supplementary data supporting the analysis presented in this chapter is reported in appendix B.

3.1 Regional Australia — a snapshot

Australia's economic landscape is characterised by an extremely disparate pattern of settlement and activity across regions. Half the area of the continent, for example, contains only 0.3 per cent of the population, while the most densely populated 1 per cent of the continent contains 84 per cent of the population (ABS, *Year Book Australia*, various years). Australia's population is heavily concentrated in urban centres along the eastern, south-eastern and south-western coastlines, with most people living and working in capital cities. In 1996, the eight state/territory capital cities — defined here as 'metropolitan regions' — accounted for some 63 and 65 per cent of Australia's population and employment, respectively (table 3.1).

The remainder of Australia's population — around 6.7 million people — live outside the capital cites. These 'non-metropolitan' regions differ greatly in terms of size, industry composition and other characteristics. Most states have several non-metropolitan regions that each include a relatively large urban centre providing a wide range of services to surrounding regions. In Queensland, for example, large regional centres include Cairns, Townsville, Mackay, Rockhampton and Toowoomba. Other non-metropolitan regions within each state are quite varied in character, ranging from those that specialise in a relatively narrow set of activities to those with quite diversified activity bases.

The dominance of Australia's capital cities, in terms of population and employment, reflects a marked shift of people away from country areas and into metropolitan regions over the course of this century. At the turn of the century, 65 per cent of Australians lived in non-metropolitan regions. By 1947, this share had fallen to 49 per cent. It declined further to 36 per cent by 1971. Since then, the non-metropolitan population has stabilised, although there have been substantial shifts in population within rural Australia. For instance, there has been strong growth in several coastal

regions in northern New South Wales and Queensland (eg Tweed Heads, the Gold Coast and the Sunshine Coast), and economic activity has gravitated towards a number of regional centres that service nearby regions (eg Wagga, Albury and Townsville) at the expense of smaller country towns (ABS 1998a; IC 1993).

A number of factors have influenced the concentration of economic activity in Australia. For instance, capital cities and the larger non-metropolitan centres offer a range of benefits to firms such as lower transport costs associated with accessing intermediate good suppliers and distributing products to consumers, and greater opportunities to develop close business relationships with key suppliers and end-users. Lifestyle preferences are also relevant. Many Australians simply prefer to live in cities in close proximity to the coast. Cities also offer a greater variety of services and amenities.

Unemployment rates and household incomes reveal clear differences between metropolitan and non-metropolitan regions. For example, in 1996, unemployment rates in non-metropolitan regions were, on average, two percentage points higher than those in metropolitan regions (table 3.1). In the same year, average household incomes were almost $10 000 (30 per cent) higher in metropolitan regions. These differences are examined more closely in section 3.4 and appendix B.

Table 3.1 **Some key characteristics of metropolitan and non-metropolitan regions in Australia**

	Metropolitan	*Non-metropolitan*	*Total Australia*[a]
Population			
Total 1996 ('000)	11 233.0	6 659.4	17 892.4
Share of total (per cent)	62.8	37.2	100.0
Growth 1981-96 (per cent)	21.1	25.6	22.7
Employment			
Total 1996 ('000)	4 990.1	2 644.7	7 634.7
Share of total (per cent)	65.4	34.6	100.0
Growth 1981-96 (per cent)	21.5	20.9	21.3
Unemployment			
Rate in 1996 (per cent)	8.5	10.5	9.2
Household income			
Average in 1996 ($'000)	41.9	32.5	38.5

[a] Population data differ from the ABS official estimate of Australia's total resident population in 1996 (18.3 million on June 30 1996) due largely to undercounting that occurs in the Census of Population and Housing. Differences in methodology between the ABS Census of Population and Housing and the ABS Labour Force Survey mean that the employment and unemployment data used throughout this chapter differ from those examined in chapter 4. An explanation of these differences is contained in ABS (1998b).

Sources: Derived from ABS (*Integrated Regional Database, Australia 1998*, Cat. no. 1353.0; unpublished 1996 Census of Population and Housing data).

3.2 Structural change in metropolitan and non-metropolitan regions

Differences in the concentration and nature of economic activity across Australia affect the way structural change impacts on people living in different regions. One reason for this is that smaller and more remote regional towns are often relatively specialised — with activity centred on a handful of core industries — while metropolitan and strongly service-based non-metropolitan regions generally have more diversified industry bases. Hence, the closure of a major business in a small regional centre is likely to have a larger impact on the surrounding community than would the closure of a similar operation in a capital city.

As expected, the core industries in non-metropolitan regions tend to be much more natural resource oriented than those in metropolitan regions. In 1996, 86 per cent of Australia's agricultural employment and 76 per cent of its mining employment were located in non-metropolitan regions (table 3.2). The perishability and/or bulkiness of the output produced by these industries means that manufacturing activities closely linked to primary and mining activities, such as food and minerals processing, are also more prevalent in non-metropolitan regions. Metropolitan regions, by contrast, have larger shares of many other manufacturing activities and most services.

These differences in industry mix have affected the pattern of employment growth across regions (table 3.2). Between 1981 and 1996:

- falls in agricultural employment had a sizeable impact on employment in non-metropolitan regions. As expected, changes to agricultural employment had minimal impact in metropolitan regions;

- the brunt of the fall in overall manufacturing employment has been felt in metropolitan regions. In these regions, manufacturing employment declined by 146 700 people, with three industries — Other machinery; Transport equipment; and Textiles, clothing and footwear — accounting for two-thirds of this decline. In contrast, there was only a slight overall decline in manufacturing employment in non-metropolitan regions, although there were some interindustry differences. For example, strong falls in employment in the Basic metals industry (of 30 100 people) were countered by increases in the Food, beverages and tobacco, Fabricated metals (eg production of sheet metal containers, girders, and hand tools) and Paper and printing industries in non-metropolitan regions; and

- the services sector drove the overall growth in employment in both metropolitan and non-metropolitan regions. In metropolitan regions, services employment grew by almost 1.2 million, with the greatest increases in the Finance and business and Education and health industries. In non-metropolitan regions, overall services sector employment increased by 614 200, with the greatest increases occurring in the Education and health and Wholesale and retail industries.

Table 3.2 **Metropolitan and non-metropolitan regions, features of employment by sector and industry, 1981 to 1996[a]**

Sector/industry	*Share of total industry employment 1996*		*Employment growth 1981—1996*	
	Metropolitan	*Non-metropolitan*	*Metropolitan*	*Non-metropolitan*
	%	%	'000	'000
Agriculture	**13.7**	**86.3**	**4.4**	**-58.7**
Mining	**23.6**	**76.4**	**1.3**	**-4.0**
Manufacturing	**70.2**	**29.8**	**-146.7**	**-1.4**
Food, beverages and tobacco	53.5	46.5	-11.8	9.8
Textiles, clothing and footwear	76.9	23.1	-26.5	-4.9
Wood products	60.8	39.2	-4.2	0.1
Paper and printing	79.5	20.5	10.0	5.4
Chemicals/petroleum	82.5	17.5	-10.2	2.0
Non-metallic minerals	67.6	32.4	-8.0	-2.0
Basic metals	43.2	56.8	-8.0	-30.1
Fabricated metals	71.0	29.0	-12.4	9.0
Transport equipment	77.9	22.1	-29.8	1.0
Other machinery	79.0	21.0	-41.3	2.7
Other manufacturing	82.3	17.7	-4.3	5.6
Services	**68.0**	**32.0**	**1163.0**	**614.2**
Electricity, gas & water	51.3	48.7	-45.3	-21.6
Construction	63.7	36.3	59.7	21.0
Wholesale and retail	66.9	33.1	251.9	159.8
Transport/communications	70.0	30.0	32.5	-1.0
Finance and business	78.1	21.9	336.0	98.5
Public admin/defence	66.3	33.7	-5.4	25.3
Education, health etc	66.2	33.8	345.6	217.8
Recreational/personal	63.3	36.7	188.0	114.4
Not elsewhere classified[b]	65.3	34.7	-127.6	-100.8
Total	**65.3**	**34.7**	**894.5**	**449.3**

a Differences in methodology between the ABS Census of Population and Housing and the ABS Labour Force Survey mean that the employment and unemployment data used throughout this chapter differ from those examined in chapter 4. An explanation of these differences is contained in ABS (1998b). **b** This category largely comprises people who did not state the industry in which they were employed as well as those operating in non-classifiable economic units.

Sources: PC estimates based on ABS (*Integrated Regional Database, Australia 1998*, Cat. no. 1353.0; unpublished 1996 Census of Population and Housing data).

Relative rates of structural change

In chapter 2, a structural change index (SCI) was used to compare rates of structural change across countries. This section uses the same measure to compare average

rates of structural change in employment across metropolitan and non-metropolitan regions.

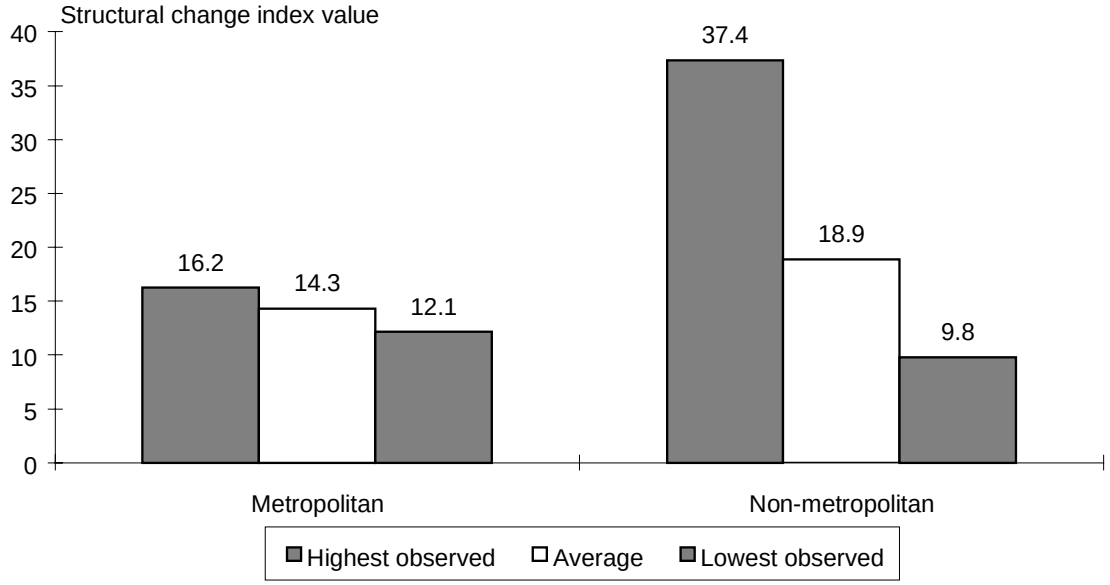
Regional SCIs were calculated using industry employment data (2-digit ASIC — 60 industries) for all regions for the period 1981 to 1996. The resulting SCIs are not strictly comparable with those calculated at the national level in the previous chapter. The greater level of industrial disaggregation employed in this analysis results in the observation of more structural change (see appendix A). Even so, the relatively detailed industry data used in this chapter still understate the full extent of structural change within a region. Employment shifts that occur *within* individual 2-digit ASIC industries are not picked up by SCIs — or indeed, any form of analysis using the same dataset.

Another factor to be considered in using SCIs is that they do not explicitly take aggregate growth into account. For instance, consider a region in which employment doubled in all industries over a period of time. As the industry shares of total employment would not have changed, the resulting SCI value for this region would be zero — the same SCI as would have been the case if employment had remained unchanged in all industries in the region over the period. This example highlights the fact that SCIs shed light on only part of the structural change experience of regions. Clearly, SCIs should be studied in concert with other regional data to gain a complete picture of the structural change experience of particular regions.

Nonetheless, SCIs are useful summary measures that can be used to compare rates of structural change across regions over time. Moreover, the absolute magnitude of a SCI provides useful information in its own right. Assume, for example, that a region registered a SCI value of 10, based on changes in its industry employment shares over a given period. This means that, at the end of the period, 10 per cent of the workforce of the region would have to be moved into different industries in order to re-establish the industry employment shares prevailing at the start of the period.

Figure 3.1 reveals that all metropolitan and non-metropolitan regions experienced a degree of structural change between 1981 and 1996. Although the average SCIs for the non-metropolitan regions were higher than metropolitan regions, the results were not markedly different — translating into a compositional shift in employment of around 1.3 per cent a year for non-metropolitan regions compared with about 1 per cent for metropolitan regions. Non-metropolitan regions, however, exhibited considerably more variability in their rates of structural change than metropolitan regions (figure 3.1). This reflects, in part, the greater variety in their industry bases, with some being highly specialised (often dominated by a few agricultural or mining activities) and others approaching the industrial diversity of metropolitan regions.

Figure 3.1 **Structural change in metropolitan and non-metropolitan regions, 1981 to 1996**



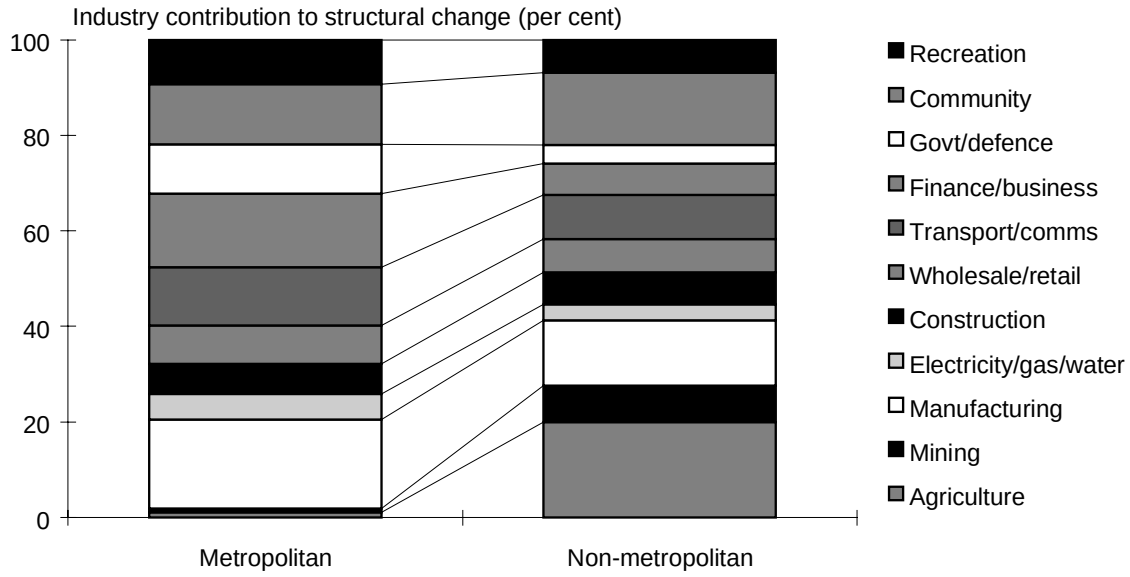
Data sources: Derived from ABS (*Integrated Regional Database, Australia 1998*, Cat. no. 1353.0; unpublished 1996 Census of Population and Housing data).

Some key differences between these two broad regional groups influenced the observed pattern of structural change across regions. Specifically, the much larger average size of metropolitan regions (in terms of population and levels of economic activity) combined with the larger number of non-metropolitan regions implies higher average rates of change and greater variability in rates of change for non-metropolitan regions.[2]

The average contribution to the SCIs arising from changes in the relative size of different industries for metropolitan and non-metropolitan regions is presented in figure 3.2.

2 A comparison of SCIs at the more aggregated statistical division level for both regional groups confirms that aggregation does mask some structural change. However, the average SCI value for the non-metropolitan regions was only slightly reduced — the resulting SCI value remained above that of the metropolitan regions (18.5 compared with 14.3).

Figure 3.2 **Decomposition of structural change in metropolitan and non-metropolitan regions by industry, 1981 to 1996**



Data sources: Derived from ABS (*Integrated Regional Database, Australia 1998*, Cat. no. 1353.0; unpublished 1996 Census of Population and Housing data).

Key drivers of structural change in metropolitan regions between 1981 and 1996 are summarised below.

- The decline in manufacturing employment accounted for almost one-fifth of the total observed structural change, the largest contribution of any broad industry group. This was driven by restructuring across most manufacturing industries.

- The next biggest contributor was the growth in employment in the Finance and business services industry. Strong growth over the period saw it contribute 15 per cent of the SCI for metropolitan regions.

- Other service industries that made relatively large contributions to structural change were a range of community services (including the Education, health and welfare industries) and the Recreational, personal and other services industry — which includes restaurants, hotels, entertainment and a range of other personal services. In total, these service industries were responsible for 22 per cent of all structural change in metropolitan regions over the period — the same share they contributed to non-metropolitan regions.

- Changes to government administration and defence employment contributed around 10 per cent of the SCI for metropolitan regions (figure 3.2).

A decomposition of the SCI for non-metropolitan regions revealed a few noticeable differences.

- The decline in employment in agriculture was the largest single source of structural change — contributing one-fifth of the total structural change experienced over the period, compared with one per cent in metropolitan regions.

- Restructuring within the mining sector, particularly in the Coal and Metallic minerals industries, accounted for 8 per cent of non-metropolitan structural change.

- The manufacturing sector's contribution to overall structural change was under 14 per cent — well below that of metropolitan regions. Changes in the Basic metals industry — including iron and steel casting and forging, as well as aluminium, copper, lead and zinc smelting and refining — were a key driver of structural change in non-metropolitan regions, but the industry was one of the more stable industries in metropolitan regions.

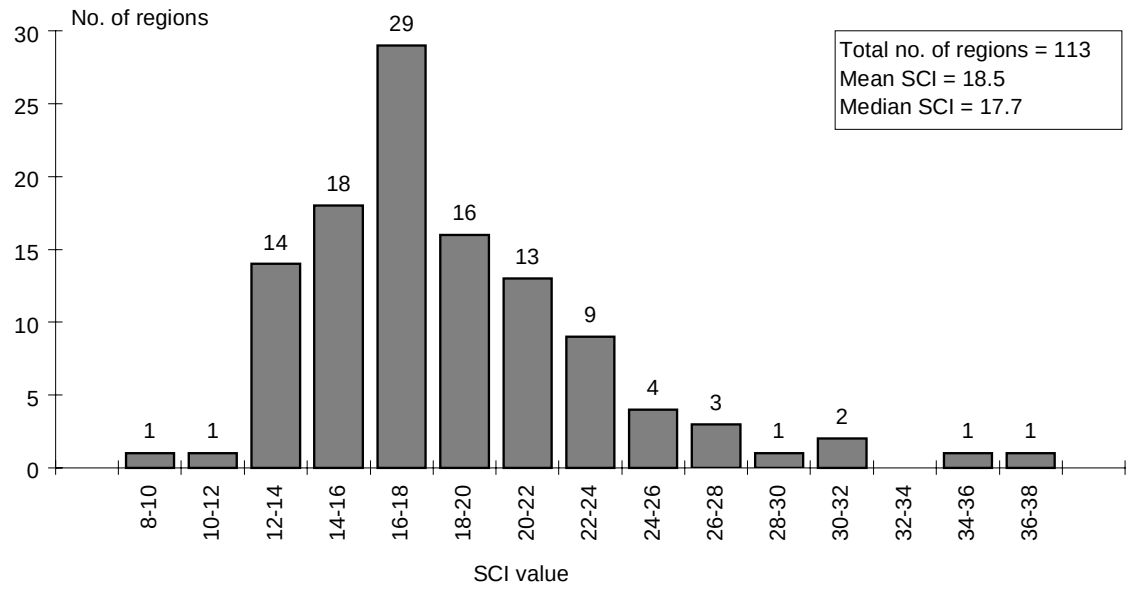
As aggregation at the metropolitan/non-metropolitan level masks much of the diversity in the form and rate of structural change within individual regions, the following section examines regional SCIs in more detail.

3.3 Regional variability and industry adjustment

A frequency distribution of SCI values for all 113 regions covering the period 1981 to 1996 is presented in figure 3.3. The most noticeable feature is the extent of variability in the degree of structural change experienced across Australia. Although around half of all regions had SCI values falling between 14 and 20, the remaining regions recorded SCIs ranging from just over half, to over twice, the national average.

Clearly, some Australian regions have experienced a great deal of structural change over the past decade and a half. The Lyell region on the west coast of Tasmania, for example, registered a SCI of 37.4 — the highest in Australia. A further three regions — Fitzroy (WA), Arnhem (NT) and Fortescue (WA) — registered SCI values in excess of 30. Employment in each of these regions was heavily dependent on mining-related activities in 1981.

Figure 3.3 **Frequency distribution of regional SCI values, 1981 to 1996**



Data sources: Derived from ABS (*Integrated Regional Database, Australia 1998*, Cat. no. 1353.0; unpublished 1996 Census of Population and Housing data).

An obvious implication that can be drawn from figure 3.3 is that no Australian region was immune from structural change — all experienced shifts in the industry composition of their employment bases between 1981 and 1996. Even the most stable regions — such as the heavily agriculturally-based Mildura/Mallee (Vic) and Lower Murrumbidgee (NSW) regions and highly service-oriented regions like Bathurst-Orange (NSW) and Perth — registered SCIs of around 10–12.

Regional size, industry composition and structural change

The wide differences in the structural change experiences of Australia's regions raise the question as to whether there are particular regional characteristics associated with high and low rates of structural change.

Analysis of data on the size and industry composition of regions provides some useful insights. However, it is important to recognise that a wide range of other factors also influence changes in the employment structures of regions, including the relationships between a region's core and non-core activities, the range of markets for a region's products (eg reliance on domestic and/or export markets) and the nature of linkages between different regions (eg proximity to growing and declining regions).

In undertaking this form of analysis of change at a regional level, there is a need to assess the appropriate level of aggregation. The approach adopted throughout this chapter has been to draw on the most disaggregated set of regions for which consistent industry data are available. Although the resulting SCIs were generally larger than the SCI for Australia (taken as a single region), they give a better indication of the structural pressures experienced by people living in different parts of the country. For example, if a coal mine closes down in one region, while another opens in a region on the other side of the country, the industry structure — from a national perspective — has not changed. But clearly, these changes have large impacts on the people living in the affected regions.

Regions were ranked from lowest to highest according to their SCI values and grouped into quintiles for ease of presentation. Table 3.3 presents information on average working age population, employment and industry composition for regions in each quintile.

Table 3.3 **Relationship between structural change, population, employment, and industry structure at the regional level**[a]

	Low SCI		***Average SCI***		***High SCI***	
SCI quintile	*Q1*	*Q2*	*Q3*	*Q4*	*Q5*	***All***
Average SCI	***13.2***	***15.8***	***17.6***	***19.9***	***25.8***	***18.5***
Working age population ('000)						
1981	55.1	39.8	30.2	24.0	15.4	**27.9**
1996	61.5	49.3	41.2	28.8	18.0	**33.6**
Employment ('000)						
1981	27.6	22.4	18.2	14.5	7.8	**15.1**
1996	32.3	26.0	20.8	16.4	9.8	**18.2**
Industry shares of employment						
Agriculture						
1981	14.7	22.1	23.5	24.3	14.2	**19.9**
1996	11.4	17.0	16.6	16.4	9.5	**14.2**
Mining						
1981	0.6	1.0	2.3	3.8	14.3	**4.5**
1996	0.5	1.3	1.9	3.6	10.7	**3.7**
Manufacturing						
1981	12.2	10.5	13.2	11.8	11.1	**11.7**
1996	10.7	9.3	12.0	10.0	9.2	**10.2**
Services						
1981	72.5	66.3	61.0	60.1	60.4	**63.9**
1996	77.4	72.4	69.5	70.0	70.7	**71.9**

a All data are simple averages except the working age population and employment levels, which represent the median observation for each quintile.

Sources: PC estimates based on ABS (*Integrated Regional Database, Australia 1998*, Cat. no. 1353.0; unpublished 1996 Census of Population and Housing data).

These data indicate that regional size — whether measured in terms of working age population or employment — is inversely related to rates of structural change, as measured by SCIs. Put simply, the smaller regions experience the greatest rates of structural change. One likely explanation for this is that larger regions tend to have more broadly based industry structures. Thus, changes in the relative size of one or two core industries typically account for smaller proportions of their employment bases than smaller size regions. There is also a greater likelihood of offsetting intraindustry changes in employment within regions with larger individual industry groups.

An examination of industry employment shares by quintile reveals other clear differences in the characteristics of regions experiencing different rates of structural change.

- The regions that experienced the highest rates of structural change tended to be heavily reliant on mining activities. Mining employment averaged 14.3 per cent of total employment for regions in the fifth quintile in 1981, compared with only 0.6 per cent for regions in the first quintile (table 3.3). Nearly half the regions in the fifth quintile had at least 10 per cent of their employment in the mineral sector.

- Regions with larger-than-average services sectors in 1981 registered systematically lower rates of structural change — over half the regions in the first quintile had services sector employment shares at least 10 percentage points above the national average.

- There is no obvious link between structural change and the relative size of agricultural and manufacturing activities (although, as the earlier discussion revealed, there have been differences in the extent of change within these sectors between metropolitan and non-metropolitan regions).

Table 3.3 also provides some insights into the structural shifts out of agriculture, mining and manufacturing and into services — discussed in the previous chapter. An examination of changes in industry employment shares between 1981 and 1996 for each quintile suggests that these shifts have been broadly based. For example, average shares of services sector employment increased appreciably in all quintiles, while simultaneously decreasing across all quintiles for the agriculture and manufacturing industries. Average mining shares declined in all but the second quintile (table 3.3).

In the case of services and agriculture, the national trend is clearly evident in almost all regions (table 3.4). The employment share of the services sector increased in 109

Table 3.4 **Sectoral employment shares, growth and decline across regions, 1981 to 1996**

	Number of regions in which ...			
	... sector share rose	*... sector share fell*	*... sector share was stable*[a]	... sector share remained negligible[b]
Agriculture	2	88	18	5
Mining	16	21	22	54
Manufacturing	27	52	34	..
Services	109	1	3	..

[a] Comprises regions in which the employment share changed by less than 1 percentage point. [b] Comprises regions in which the employment share was less than 1 per cent in 1981 and remained so in 1996.

Sources: PC estimates based on ABS (*Integrated Regional Database, Australia 1998*, Cat. no. 1353.0; unpublished 1996 Census of Population and Housing data).

of 113 regions between 1981 and 1996, while the share for agriculture fell in 88 regions and increased in only 2. In contrast, the direction of structural change for mining and manufacturing activities has varied across Australia.

3.4 Structural change and regional performance

Changes in the structure of employment across regions affect employment opportunities, rates of unemployment, levels of household income and patterns of migration between regions. In regions where employment opportunities are expanding rapidly, for example, displaced workers and new entrants to the workforce are likely to find employment more easily than in regions with declining employment opportunities. Hence, any change in a region's industry structure must be viewed in the context of the overall performance of the region.

The subsequent analysis presents information covering five distinct areas:

- variations in regional performance in relation to employment growth, unemployment rates and changes in average household income;
- the interrelationship between structural change and these measures;
- the relationship between structural change and employment growth at a sub-group level;
- the relationship between a region's industry structure and its employment growth; and
- the pattern of labour mobility between regions.

Variations in regional performance

Substantial diversity was evident in the performance of Australia's 113 regions between 1981 and 1996 — measured in terms of employment growth, unemployment rates and changes in average household incomes. Key differences are briefly highlighted below. Further detail on variations in the performance of these regions, as well as a listing of the top and bottom 10 performing regions, is included in appendix B.

- Employment increased on average by 22 per cent across all regions. Overall, 82 of 113 regions recorded employment growth. Moreover:
  - 15 regions registered employment increases ranging from just over 50 per cent to a high of 168 per cent; and
  - of the 31 regions experiencing employment declines, most had reductions of from 1 to 20 per cent.
- Regional unemployment data confirm that the increases experienced at the national level over the past decade and a half (discussed in the next chapter) have been mirrored in most regions across Australia. Overall:
  - 105 regions recorded increases in their unemployment rate, the overwhelming majority of which experienced rises of 1 to 6 percentage points; and
  - only 8 regions experienced declines in their unemployment rates.
- All regions registered increases in nominal average household incomes. The average increase was 120 per cent between 1981 and 1996, with:
  - more than half of all regions recording increases within 20 percentage points of the national average; and
  - in general, incomes increased at a faster rate in metropolitan regions than non-metropolitan regions.

Clearly there have been large variations in the performance of Australia's regions over the past decade and a half. Although international data are not available at the same level of detail, a comparison of measures of economic performance at the state or equivalent level for Australia and a selection of other countries suggests that substantial differences are commonplace. Although not strictly comparable, these data, presented in appendix B, suggest that — in terms of GDP per capita and unemployment rates — Australia exhibits relatively smaller variations in economic performance at the state level than is evident across a selection of other developed countries.

Interrelationships with structural change

A natural question that arises is to what extent strong or weak regional employment growth, income or unemployment outcomes are associated with varying rates of structural change. Table 3.5 presents information on these indicators for each of the five SCI quintiles examined in section 3.3.

These data reveal widespread variation in the average rate of employment growth between most of the SCI quintiles — with employment growth ranging from a low of around 16 per cent in the second quintile to a high of almost 30 per cent in the first quintile. Nevertheless, the quintile results do not indicate any systematic relationship between the SCI value recorded by individual regions between 1981 and 1996 and the rate of employment growth over the same period.

Regional average household income and unemployment data also present a mixed picture. The fifth quintile combined higher average household income levels in both 1981 and 1996 with a high rate of structural change — a reflection of the high-income mining regions that dominate this category. The remaining quintiles, however, exhibited no such positive relationship, either in terms of income levels or rates of increase.

Table 3.5 **Structural change and regional performance, 1981 to 1996**

	Low SCI ←		***Average SCI***	→ ***High SCI***		
SCI quintile	*Q1*	*Q2*	*Q3*	*Q4*	*Q5*	***All***
Average SCI	***13.2***	***15.8***	***17.6***	***19.9***	***25.8***	***18.5***
Employment growth (per cent)	29.2	15.6	16.7	23.1	26.5	**22.1**
Average household income						
1981 ($'000)	15.3	15.0	13.6	14.9	18.3	**15.4**
1996 ($'000)	33.8	33.0	29.3	34.2	39.0	**33.9**
Growth (per cent)	119.9	119.8	115.0	128.4	117.6	**120.1**
Unemployment rate[a]						
1981 (per cent)	7.1	6.0	6.2	5.5	6.0	**6.1**
1996 (per cent)	9.6	9.0	10.5	8.9	9.0	**9.4**
Growth (percentage points)	2.5	3.0	4.3	3.4	3.0	**3.3**

[a] Differences in methodology between the ABS Census of Population and Housing and the ABS Labour Force Survey mean that the employment and unemployment data used throughout this chapter differ from those examined in chapter 4. An explanation of these differences is contained in ABS (1998b). The national totals also differ because they are unweighted averages of regional unemployment rates.

Sources: PC estimates based on ABS (*Integrated Regional Database, Australia 1998*, Cat. no. 1353.0; unpublished 1996 Census of Population and Housing data).

Unemployment data also reveal a relatively even spread of high and low unemployment regions across the five quintiles (table 3.5). The only exception was the third quintile. Although all quintiles experienced increases in their unemployment rates between 1981 and 1996, the third quintile registered stronger growth in its average unemployment rate than either the rapidly changing regions or the relatively slow-change regions.

These quintile results suggest there is no simple relationship between the aggregate rate of structural change in the industrial composition of Australia's regions — as measured by SCIs — and regional employment growth rates, changes in household income levels and changes in unemployment rates between 1981 and 1996. Accordingly, the Commission undertook a more detailed subgroup analysis to examine the nature of the relationship between structural change and regional performance. The results of this analysis are reported below.

Structural change and employment growth

To explore the relationship between structural change and employment growth in greater detail, regions were ranked according to their SCIs and split into two groups — high structural change and low structural change. Each group was then split into two further groups — high employment growth and low employment growth. This yielded four distinct groups of regions.

Figure 3.4 presents structural change and employment growth information for a selection of 15 regions for each group. Group 1, for example, contains the 15 highest SCI ranking regions that also had low employment growth rankings. In all, 60 regions are included in the figure. The broad characteristics of each group, including a closer examination of some regions within these groups, are discussed below. A summary of the major points to emerge from the analysis of these groups is presented at the end of the discussion in box 3.1.

Group 1: High structural change/low employment growth

This group registered an average SCI value of 23.9 coupled with an average decline in employment of almost 13 per cent between 1981 and 1996 (figure 3.4). All but two regions (ie Wollongong and the Upper Darling in NSW) registered falls in the total number of persons employed. The sharpest decline was in Lyell (Tasmania), where employment fell by almost 60 per cent — a decline of around 3000 jobs. As noted earlier, this region also registered the largest SCI value in Australia. The key industry that drove these changes was the Metallic minerals industry, with employment falling from almost 2000 workers in 1981 to only 600 in 1996 (largely

Figure 3.4 **Structural change and employment growth between 1981 and 1996 — regional groupings**

High

Group 1 *High change/low growth*	*SCI*	*Emp growth*
Lyell (Tas)	37.4	-58.2
Arnhem (NT)	30.9	-5.7
Fortescue (WA)	30.5	-5.8
Wollongong (NSW)	29.8	3.6
Far West (NSW)	26.6	-31.1
De Grey (WA)	24.7	-11.5
Whyalla (SA)	23.3	-28.1
Flinders Ranges/Pirie (SA)	23.2	-21.8
Gippsland (Vic)	22.0	-10.7
Upper Darling (NSW)	21.7	0.4
West Central H'lands (Vic)	21.4	-27.5
Campion (WA)	20.9	-10.0
Lower North (SA)	20.4	-11.4
Central Tablelands (NSW)	20.1	-5.3
Central West (Qld)	19.2	-11.2
Group average	**23.9**	**-12.6**

Group 2 *High change/high growth*	*SCI*	*Emp growth*
Fitzroy (WA)	34.4	80.8
Gascoyne/Carnegie (WA)	27.2	37.2
Dale (WA)	25.9	127.7
Lower Top End/Barkly (NT)	25.7	48.8
North-West (NT)	24.1	168.0
Ord (WA)	23.8	41.6
Vasse (WA)	22.7	111.1
Lefroy (WA)	22.6	70.1
Far North (Qld)	20.8	44.1
Mackay Bal (Qld)	20.7	40.3
Outer Adelaide (SA)	20.7	43.5
East Central H'lands (Vic)	20.5	65.3
Cairns City Part A (Qld)	19.4	98.3
Moreton Bal (Qld)	19.1	74.7
Snowy (NSW)	18.7	59.9
Group average	**23.1**	**74.1**

SCI

Group 3 *Low change/low growth*	*SCI*	*Emp growth*
North Eastern (Tas)	17.1	-17.1
North Wimmera (Vic)	16.2	-30.9
Pallinup (WA)	16.0	-15.5
Hotham/lakes (WA)	16.0	-18.8
Upper South East (SA)	15.5	-8.6
Lachlan (NSW)	15.4	-10.3
Northern Slopes (NSW)	14.6	-3.1
Murray-Darling (NSW)	13.8	1.0
Riverland (SA)	13.7	2.1
North Central Plain (NSW)	13.5	-10.6
Lower South East (SA)	12.9	4.2
Northern Tablelands (NSW)	12.8	-1.6
Adelaide	12.6	11.2
Mildura/Mallee (Vic)	12.4	5.9
Lower M'bidgee (NSW)	9.8	2.8
Group average	**14.2**	**-5.6**

Group 4 *Low change/high growth*	*SCI*	*Emp growth*
South Loddon (Vic)	17.8	52.9
Darwin	16.2	47.1
R'mond-Tweed Bal (NSW)	16.0	39.0
Lower South Coast (NSW)	15.6	44.4
Queanbeyan (NSW)	15.3	97.6
Mackay City Part A (Qld)	14.7	37.0
Brisbane	14.4	49.2
Sunshine Coast (Qld)	13.8	112.2
Central NT	13.6	56.8
Tweed Heads (NSW)	13.3	67.0
Gold Coast (Qld)	13.2	125.6
Canberra	12.9	47.9
Greater Shepparton (Vic)	12.8	40.3
Perth	12.1	43.1
Bathurst-Orange (NSW)	11.6	22.5
Group average	**14.3**	**54.1**

Low ← **Employment growth** → **High**

Data sources: Derived from ABS (*Integrated Regional Database, Australia 1998*, Cat. no. 1353.0; unpublished 1996 Census of Population and Housing data).

at the Mt Lyell copper mine). Staffing reductions in the Electricity and gas industry resulted in the loss of a further 1000 jobs.

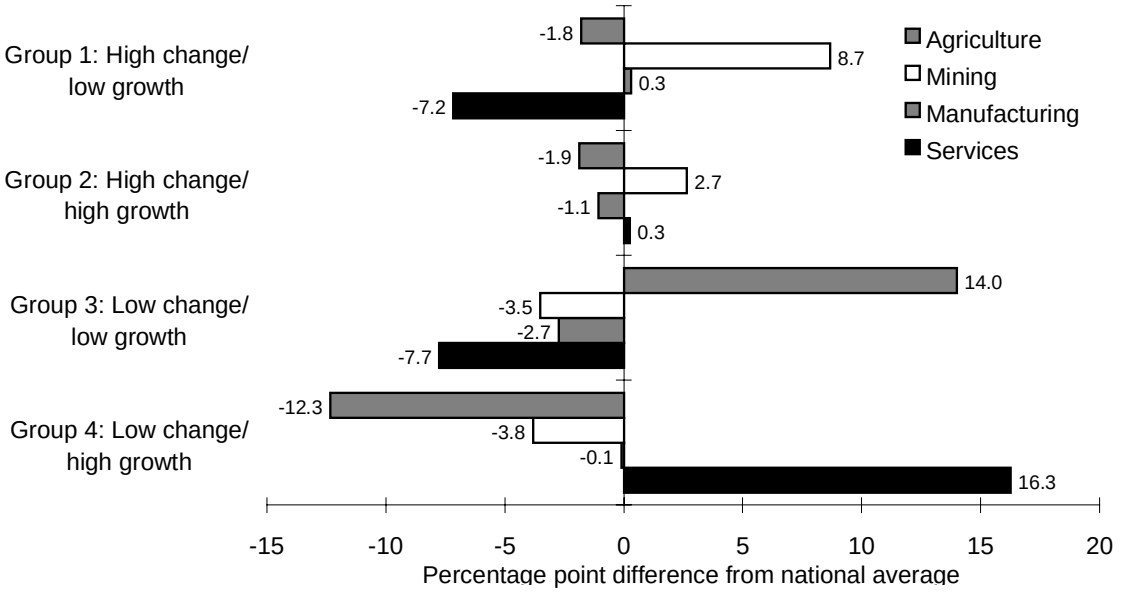
Other regions in this group that experienced a weak employment performance due to the decline of a core mature industry included the Whyalla and Flinders Ranges/Pirie regions in South Australia. Both regions are heavily dependent on the

Basic metals industry for employment, and have experienced substantial structural changes as the industry has declined.

A dominant feature of most regions in this group is their above-average reliance on mining activities combined with a considerably weaker representation in services sector employment. Figure 3.5 illustrates this. It shows the percentage point difference in the average share of employment in each broad industry category for regions in this group relative to the average for all regions in Australia. The share of employment accounted for by the mining industry for this group was around 9 percentage points above the average for all regions in 1981. In contrast, service industries formed a considerably smaller share of employment in most regions in this group relative to most other regions in Australia.

Between 1981 and 1996, the average household income of regions in this group increased by 11 per cent less than the national average. This group also registered the largest average increase in unemployment rates — from 5.7 per cent in 1981 to 9.2 per cent in 1996.

Figure 3.5 **Regional group initial industrial structure — difference from national average in 1981**



Data sources: Derived from ABS (*Integrated Regional Database, Australia 1998*, Cat. no. 1353.0; unpublished 1996 Census of Population and Housing data).

Group 2: High structural change/high employment growth

With an average SCI value of 23.1, regions in this group recorded similar rates of structural change to those in the first group. But the employment outcome was markedly different, with average employment growing at more than three times the national average. The group contained a number of remote regions that underwent extensive changes over the period. In all, the first eight regions in this group were in either Western Australia or the Northern Territory. As with the first group, a number of these regions experienced high rates of structural change driven by changes in a core industry. The Gascoyne/Carnegie and Lefroy regions in Western Australia are good examples. In both cases, increases in mining and related activities contributed substantially to overall employment growth.

The group was not confined to the more remote areas of Australia. The rapid growth in tourism and associated activities between 1981 and 1996 resulted in strong growth combined with an above-average rate of structural change in Cairns. The group also contained high-growth regions close to large cities such as Queensland's Moreton region and the Outer Adelaide region in South Australia.

Overall, the regions within this group exhibited the greatest diversity of industrial structures of the four groups. The differing industry structures of the regions in this group tended to offset each other when aggregated to derive a group average. As figure 3.5 shows, no broad sector share of employment for this group differed substantially from the national average. One clear difference from the other high-SCI group (group 1) was the share of services employment. Whereas services activities were clearly under represented in the first group, they were on par with the national average for regions in group 2.

Average household incomes of regions making up this group registered the largest increase over the period 1981 to 1996 — around 20 per cent higher than the national average. Along with group 3, this group also experienced the smallest increase in unemployment. In 1996, it had an average unemployment rate of 8.1 per cent, only slightly above the average for group 3. This outcome suggests that high rates of structural change need not be associated with relatively high rates of unemployment or relative declines in household income.

Group 3: Low structural change/low employment growth

This group recorded an average SCI value of 14 together with a net decline in employment of around 6 per cent on average. Nine of the 15 regions in the group registered absolute falls in employment. Although, in most cases, these declines were somewhat less marked than those experienced by the first group, the overall

employment outcome for the group was broadly comparable. They occurred, however, in the context of much lower rates of structural change.

With the exception of Adelaide, these regions were overwhelmingly rural, with agricultural employment shares of between 30 and 50 per cent commonplace. Agricultural activities (largely horticultural) in the Mildura-Mallee region in north-west Victoria, for example, accounted for 33 per cent of total employment in 1981 and declined only slightly (to 25 per cent) by 1996. This stability saw the region register a low SCI (12.4) and a rate of employment growth around one-quarter of the national average. This was, however, the strongest employment performance of the group (apart from Adelaide).

The sharpest fall in employment was experienced by Victoria's North Wimmera region — down by 31 per cent over the period, driven largely by falls in agricultural employment (of around 1800). Although this decline resulted in some structural change, the region remained heavily reliant on agriculture, which accounted for 36 per cent of total employment in 1996.

Figure 3.5 indicates that for the group overall: employment in agriculture was well above the national average; mining employment was very small; and the services base was the smallest of the four groups. In 1981, only 56 per cent of employment, on average, was accounted for by the services sector. Although this share increased steadily over the ensuing decade and a half — to 62 per cent in 1996 — it actually fell even further behind the national average due to the stronger growth in services employment in most other regions.

As with the other low employment growth regions (group 1), average household incomes increased by less than the national average (around 11 per cent less) between 1981 and 1996. Despite the negative or low rates of employment growth, unemployment rates did not increase particularly strongly. On average, unemployment rates rose by 2.3 percentage points — resulting in an average unemployment rate of 7.9 per cent in 1996 (compared with an average of 9.4 per cent for all regions). The unemployment experience was almost identical to that of group 2 regions.

Group 4: Low structural change/high employment growth

This group registered an almost identical average rate of structural change to group 3, but had a much better employment growth outcome (figure 3.4). Its employment growth was more than double the national average. The experiences of the two Australian regions with the lowest SCIs — Lower Murrumbidgee (group 3) and Bathurst-Orange (group 4) in NSW — illustrate the differences between the two

groups. With SCI values of 9.8 and 11.6 respectively, both experienced limited changes to their industry structures between 1981 and 1996. But, while employment in Bathurst-Orange increased by over 20 per cent, it grew by less than 3 per cent in Lower Murrumbidgee.

Differences in the underlying structure of both regions help to explain this result. Agricultural activities accounted for 29 per cent of the Lower Murrumbidgee's employment in 1981. This had fallen only slightly (to 26 per cent) by 1996. Although there was some agricultural activity in the Bathurst-Orange region, employment was dominated by the services sector at the start of the period and remained so in 1996. This reflects the key role Bathurst-Orange plays in providing a range of services to surrounding areas.

Regions in this group differ markedly from the other high employment growth regions (group 2), with a far greater services orientation in their industry bases and consistently lower rates of structural change. Queensland's Sunshine Coast, for example, registered a SCI value of less than 14, while doubling its employment between 1981 and 1996. Vasse in Western Australia (a group 2 region) also doubled its employment. But with a SCI value of around 23, it experienced considerably more structural change.

Easily the most urbanised of all the groups, this group includes the four high-growth capital cities — Perth, Canberra, Brisbane and Darwin — the town of Queanbeyan (which is adjacent to Canberra) and a number of high-growth coastal areas in NSW and Queensland. Overall, regions in this group had employment bases in 1981 that were heavily oriented towards a range of service industries and a much lesser reliance on agricultural and mining-based activities (figure 3.5). More than half of these regions had services sectors that accounted for over 80 per cent of employment in 1981.

Along with regions in the other high employment growth category (group 2), these regions registered above average increases in average household incomes between 1981 and 1996. However, this group recorded the highest average rate of unemployment in 1996 (9.9 per cent) — reflecting unemployment rates of between 14 and 16 per cent in some coastal areas in Queensland and NSW.

The more distinctive features of the four regional groups are summarised in box 3.1.

In summary, this analysis illustrates the diversity of adjustment experience among Australia's regions. One implication is that the extent of compositional change in the industry employment shares of a region is only one indicator of the structural pressures a region experiences. Clearly, a region's SCI value must be considered in the context of other region-specific factors.

Box 3.1 Key features of the four structural change/employment growth regional groups

Group 1: High change/low growth

This group was characterised by:

- the weakest employment performance of all groups (with an average fall of 13 per cent between 1981 and 1996);
- an above-average reliance on mining activities (the mining employment share was 9 percentage points above the national average in 1981);
- a considerably weaker representation in services sector employment (7 percentage points below the national average);
- employment declines driven by reductions in core mature manufacturing and mining industries such as steel and coal;
- the largest average increases in unemployment rates (up from 5.7 per cent in 1981 to 9.2 per cent in 1996); and
- a below-average growth in household incomes.

Group 2: High change/high growth

This group was characterised by:

- the strongest employment performance of all groups (with an average increase of 74 per cent);
- the greatest diversity in industry structures;
- average employment shares for agriculture, mining, manufacturing and services very close to the national average in 1981;
- several remote high-change regions in Western Australia and the Northern Territory and a number of rapidly changing, high-growth regions close to large cities;
- along with group 3, the smallest deterioration in unemployment — with a group average unemployment rate of 8.1 per cent in 1996; and
- the largest increases in average household incomes (20 per cent above the national average).

Group 3: Low change/low growth	*Group 4: Low change/high growth*
This group was characterised by: • an average decline in employment of 6 per cent — with 9 of the 15 regions registering absolute falls in employment; • a heavy orientation towards agricultural activities — with agricultural employment shares of 30 to 50 per cent in 1981 commonplace; • very little change in the extent of reliance on agricultural activities between 1981 and 1996; • the smallest shares of services employment in both periods (8 and 10 percentage points below the national average in 1981 and 1996 respectively); • a smaller deterioration in its unemployment rate, rising from 5.6 per cent in 1981 to 7.9 per cent in 1996; and • a below-average increase in household incomes.	This group was characterised by: • a rate of employment growth more than double the national average (54 per cent); • a large number of urbanised regions, including several capital cities and adjacent regions, and some high-growth coastal areas in NSW and Queensland; • an employment base that was heavily oriented towards service industries (services' employment share was over 16 percentage points above the national average in 1981); • a much lesser reliance on agricultural and mining-based activities; • the highest average rate of unemployment in 1996 (9.9 per cent) — reflecting unemployment rates of between 14 and 16 per cent in coastal areas in NSW and Queensland; and • a higher-than-average increase in household incomes.

For example, many regions in group 4 were able to achieve strong employment growth without substantial structural change because of either locational advantages or because their employment bases were already oriented towards higher-growth service industries. In contrast, regions in group 3 generally experienced declining employment bases, in part because they are heavily oriented towards agricultural activities. These regions, however, generally did not have the scope or opportunity to change their industry structures towards higher growth activities. Many of them registered low SCI values, similar to regions in group 4, but under markedly different circumstances. Hence, it is clear that a range of factors influence regional growth, structural change and performance — including industry structure. This is examined below.

Industry structure — its relationship to employment growth

A simple industry-structure explanation of regional growth is that the better performing regions would have relatively more of the strong industry performers and fewer of the poor performers. As described earlier, services has been the sector that has grown the most quickly in recent decades. Accordingly, it could be expected that the regions with larger services sector shares in 1981 would have grown the fastest.

There is some truth in this. But the diversity in the growth experiences of different service industries means that this relationship is somewhat inexact. When the 60 ASIC industries used in this analysis were ranked in terms of national employment growth rates between 1981 and 1996, service industries comprised 26 of the top 30 growth industries. But not all service industries performed strongly. Water transport, Rail transport, Electricity, Gas and Water were some of the slowest growing industries. This suggests that a technique that takes into account the diversity of individual industry performances (at a national level) is likely to provide a better indication of the importance of industry structure to regions.

Shift-share analysis allows the calculation of the growth rate that a region would have achieved over a period if each of its industries had, from the start of the period, grown at the national average rate for that industry (see appendix B). By comparing the resulting 'hypothetical' regional growth rates with the actual growth outcomes for each region, it is possible to gauge the extent to which a region's performance over a period is due to its industrial base as opposed to other factors. Clearly, this form of analysis does not provide a causal explanation of growth differences between regions. It represents nothing more than a means of examining the link between a region's employment base and its rate of employment growth.

Projected regional employment growth rates are presented on the horizontal axis of figure 3.6, plotted against the actual rate of employment growth achieved by each region. A clear positive relationship is evident — hardly a surprising result. It confirms the expectation that regions with large shares of high-growth industries in 1981 tended to grow faster than regions with larger shares of slow-growth industries. The result also reinforces one of the points stemming from the earlier analysis of the four structural change/employment groups. In the period under consideration, in order to grow, some regions have needed to undergo more structural change (in the form of interindustry shifts in employment) than others.

Although the relationship is statistically significant, the degree of variability in outcomes is quite marked. For example, actual employment growth rates achieved by regions were much more widely dispersed than those projected using shift-share analysis. Some regions performed much more strongly than was suggested by their industry bases, while others performed well below what might have been expected. Overall, less than 40 per cent of the variability in actual employment growth registered by the 113 regions between 1981 and 1996 could be explained by the industrial composition of the regions in 1981.

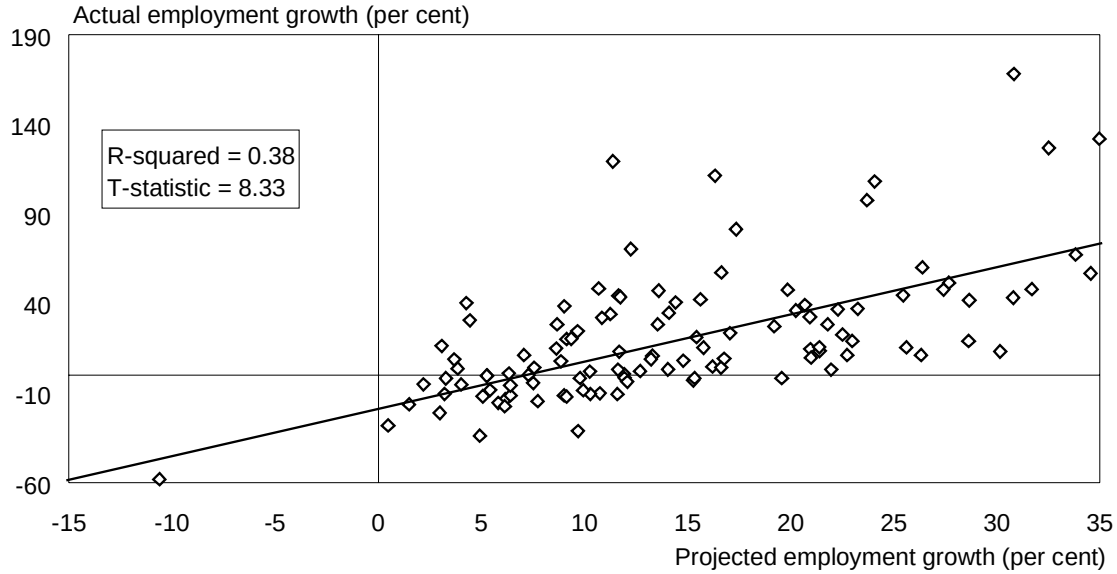
This result confirms that similar industries grew at different rates depending on the region in which they were located. Indeed, if they had not, all regions would have performed exactly as projected using the shift-share framework. In general, resource-based industries displayed the greatest regional variations in employment growth, while business services displayed the greatest stability in growth rates across regions.

Clearly, there are a range of other region-specific factors that, in combination, are more important to a region's growth performance than its starting industry structure. These factors include: differences in climate, geography and infrastructure; the discovery and exploitation of new mineral deposits or new tourist attractions; lifestyle factors; proximity to rapidly growing markets; and the location of complementary activities in adjoining regions.

Regional labour mobility

The next chapter deals with industry and occupational mobility — the movement of people from one job to another. But geographic mobility is also important. Movement between regions is one means by which people can adjust to changing employment opportunities. Where the composition of growing and declining activities results in skills available in a region differing from those in demand, or

Figure 3.6 **Regional shift-share analysis — projected employment growth compared with actual employment growth, 1981 to 1996**



Data sources: Derived from ABS (*Integrated Regional Database, Australia 1998*, Cat. no. 1353.0; unpublished 1996 Census of Population and Housing data).

where the total demand for labour within a region falls or expands, geographic mobility can be an important adjustment mechanism.

This raises the question — how mobile is Australia's population? ABS data reveal that around 15 to 17 per cent of Australia's population changed residence in each year over the period 1970 to 1987. However, the bulk of these shifts involved movements within statistical divisions. Further, many of the shifts involved moving over relatively short distances, such as between suburbs in existing urban centres. Only a small proportion of the changes in residence involved movements between statistical divisions, and most of these involved intrastate rather than interstate movements.

The latest ABS data providing information on the reasons for relocating relate to the year ended May 1987. These indicate that intrastate movements are largely driven by factors other than employment considerations — housing (32 per cent), locational (better area, closer to friends etc 17 per cent) and life cycle factors (marital status, children, retirement etc 11 per cent). Changes in residence due to employment considerations constituted only 11 per cent of all intrastate movements. Employment considerations were, however, much more influential for those people who moved interstate. Almost 45 per cent of those who moved interstate did so for employment reasons (ABS 1987).

Table 3.6 presents information on interstate population flows between 1991 and 1996. Reading across the table, it is clear that the state with the largest number of interstate arrivals was Queensland — with an inflow of 268 000 people between 1991 and 1996. The majority of these came from NSW, Victoria and South Australia. Reading down the table, it is evident that the largest number of interstate departures were from NSW — 243 400 people, 58 800 more than the number of arrivals over the same period. In percentage terms, however, Victoria experienced the greatest loss of population due to net migration between states, followed by Tasmania and South Australia.

Table 3.6 **Interstate population movements, 1991 to 1996 ('000)**

		This many people left these states ...								
		NSW	*VIC*	*QLD*	*SA*	*WA*	*TAS*	*NT*	*ACT*	**Total arrivals**
	NSW		57.9	59.9	16.1	14.0	6.5	5.0	25.1	**184.6**
... to	VIC	42.6		24.5	16.5	11.2	7.7	3.3	5.0	**110.8**
live	QLD	127.7	74.5		19.6	15.0	9.6	11.7	9.9	**268.0**
in	SA	14.3	16.8	7.7		5.3	1.9	6.0	1.6	**53.7**
these	WA	19.6	19.2	12.6	8.2		4.0	5.8	2.4	**72.0**
states	TAS	6.7	7.4	4.9	2.2	2.6		0.7	0.7	**25.1**
	NT	6.2	6.6	7.4	6.9	4.4	0.7		0.8	**33.0**
	ACT	26.2	7.0	5.5	2.6	2.1	1.1	1.0		**45.4**
	Total departures	**243.4**	**189.4**	**122.6**	**72.1**	**54.9**	**31.4**	**33.7**	**45.6**	**793.6[a]**
	Net migration	-58.8	-78.7	145.4	-18.4	17.1	-6.3	-0.7	-0.2	
	Per cent change[b]	-1.1	-2.0	5.5	-1.4	1.2	-1.5	-0.5	-0.1	

a Subtotals do not sum to this total because of movements to/from other territories. **b** Net migration as a share of the initial population.

Sources: Derived from ABS (*Integrated Regional Database, Australia 1998*, Cat. no. 1353.0; unpublished 1996 Census of Population and Housing data).

Only two states — Queensland and Western Australia — gained population as a result of interstate migration. Data for the previous census period (1986 to 1991) reveal a broadly similar picture, with net migration as a percentage of initial population being 5.4 per cent for Queensland and 1.3 per cent for Western Australia (see appendix B).

Data disaggregated to the statistical division level (the most disaggregated set available) provide some additional insights. The largest net gainers for the period 1991 to 1996 were the Moreton (Queensland) and South West (Western Australia) statistical divisions, with net migration to population ratios of 18 and 11 per cent respectively. In contrast, the largest net losers were the Pilbara (Western Australia) and North West (Queensland) regions, with respective net migration/population ratios of -22 and -18 per cent. Also among the leading net losers were the Northern (South Australia) and Mersey-Lyell (Tasmania) divisions, with respective net migration/population ratios of -10 and -5 per cent.

The fact that the states that experienced the fastest employment growth in recent decades — namely Queensland and Western Australia — were net gainers from interstate migration, suggests that population movements are one mechanism that allows Australian regions to respond to structural pressures.

ABS survey data for the period 1994 to 1996 on the preparedness of residents in different states to move interstate if offered a suitable job provide further insight into this issue. A disaggregation of these data by state, presented in an analysis by Debelle and Vickery (1998), indicates that respondents in states with relatively poorly performing labour markets (in particular South Australia and Tasmania) were more willing to move interstate to find employment. In all, 43 per cent of South Australian respondents and 41 per cent of Tasmanian respondents were prepared to move interstate if offered a suitable job. This contrasts with only 31 per cent in New South Wales and 34 per cent in Queensland and Western Australia.

Although there are few detailed studies, several indicate that geographical mobility of workers occurs in response to differences in labour market conditions, although the extent of responsiveness varies and is influenced by a range of factors (see Borland and Suen 1990; Debelle and Vickery 1998; IC 1993).

An examination of adjustment mechanisms, including the role of labour mobility, is the subject of current research being undertaken by the Productivity Commission.

4 Changes in the labour market

Structural factors have driven significant change within the Australian labour market. They have influenced the number of people offering themselves for work and the number and types of jobs available. Importantly, job growth has not kept up with the increase in the supply of labour, and the gap between the two — represented by levels of unemployment and underemployment — has grown considerably. Meanwhile, different patterns of growth across the economy have also affected the demand for particular skills. As a result, the composition of the workforce and opportunities for entering or moving between jobs and industries have changed — with the young, the old, the unskilled and those from non-English-speaking backgrounds affected most.

Changing labour market conditions have been a key dimension of structural change within Australia over the last three decades. Such changes are manifest in an analysis of unemployment trends, the composition of the workforce, the pattern of job opportunities and the ability of workers to move between industries and occupations. Much has been written on the various elements of change that distinguish past labour market conditions from those that prevail currently, and likely future trends. This chapter overviews the most significant changes within the Australian labour market in the post-1970 era and their implications for different market participants.

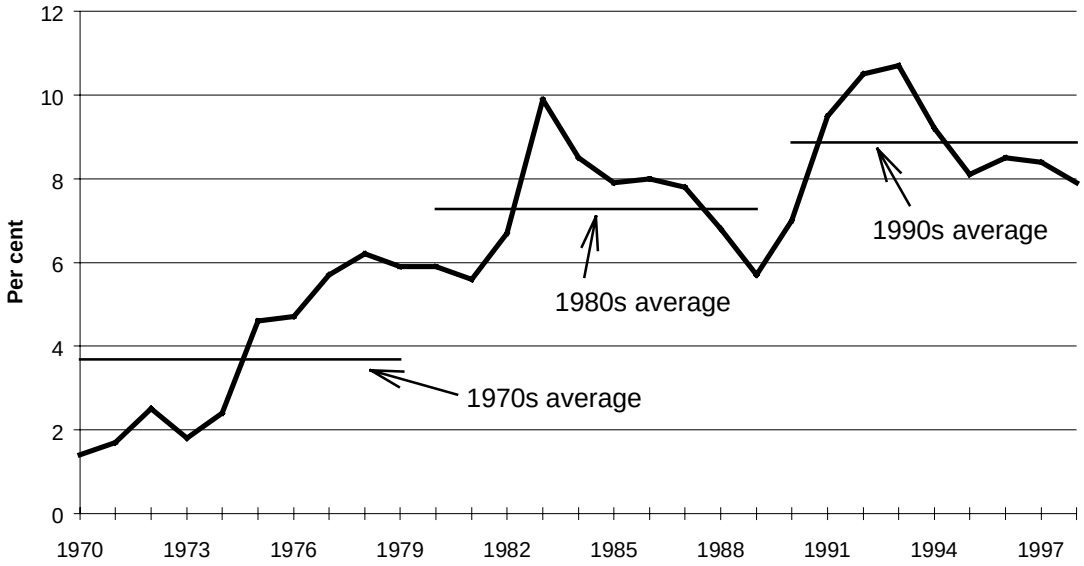
The changing dimensions of Australia's unemployment and underemployment problem, and factors underlying it, are examined in sections 4.1 and 4.2. The final section examines job mobility and the mobility characteristics of particular groups. It provides some insight to the adjustment mechanisms that exist within the labour market and how structural changes have impacted on the ability of workers to move between jobs and industries. Supplementary data supporting the analysis presented in this chapter is reported in appendix C.

4.1 Unemployment

One of the most significant outcomes of changing Australian labour supply and demand conditions over the past 25 years has been the substantial growth in unemployment. Figure 4.1 shows the path of Australia's unemployment rate; rising

rapidly from the mid-1970s and ratcheting upwards in both the early 1980s and 1990s. The August unemployment rate averaged 3.7 per cent for the 1970s, compared with 7.3 and 8.9 per cent for the later decades (figure 4.1). And currently, despite considerable job growth, which has seen unemployment fall since the early 1990s, the rate of unemployment among Australians remains over 5 times that which prevailed in August 1970 (1.4 per cent). On current estimates, around 685 600 people are unemployed.

Figure 4.1 **Unemployment rate, 1970 to 1998[a]**

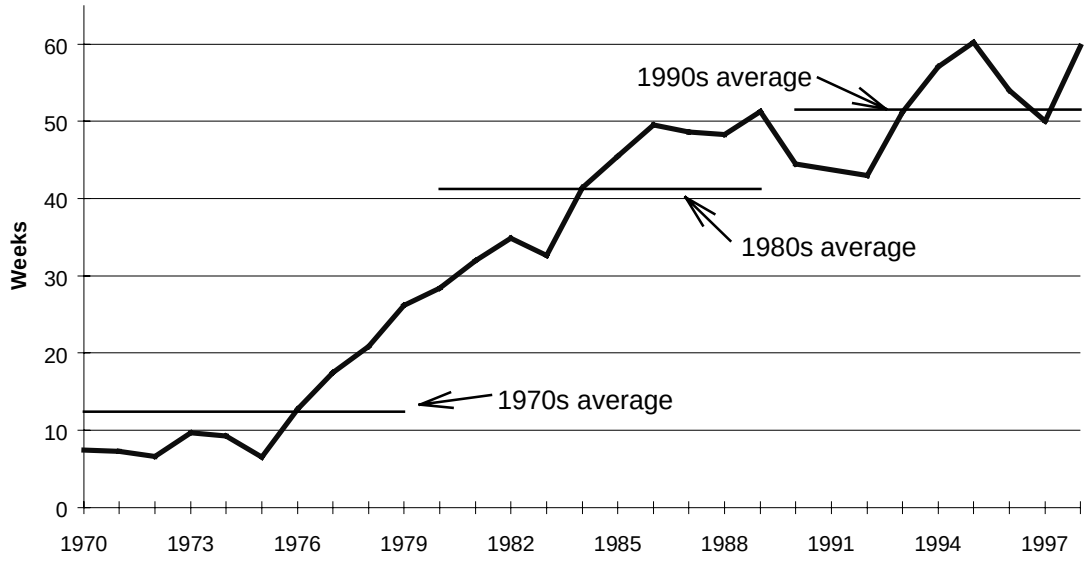


a August observations.

Data source: ABS (*The Labour Force, Australia*, Cat. no. 6203.0).

There has also been a large increase in the average time spent unemployed. As seen from figure 4.2, the average duration of unemployment has risen from around two months in the early 1970s (about 3 months for the decade as a whole), to about 8 months in the early 1980s (over 9 months for the entire decade), to about a year or more in recent times. What is more, a growing number of people have been unemployed for periods well above the average. According to Debelle and Swann (1998), the rate of long term unemployment (encompassing people unemployed for over a year) has more than doubled since 1980 to levels currently around 2.5 per cent of the labour force. By August 1998, the number of long term unemployed had grown to about one-third of the total unemployed, and over half of these had been seeking work for more than two years.

Figure 4.2 **Average duration of unemployment, 1970 to 1998[a]**



a August observations.

Data source: ABS (*The Labour Force, Australia*, Cat. no. 6203.0).

Characteristics of the unemployed

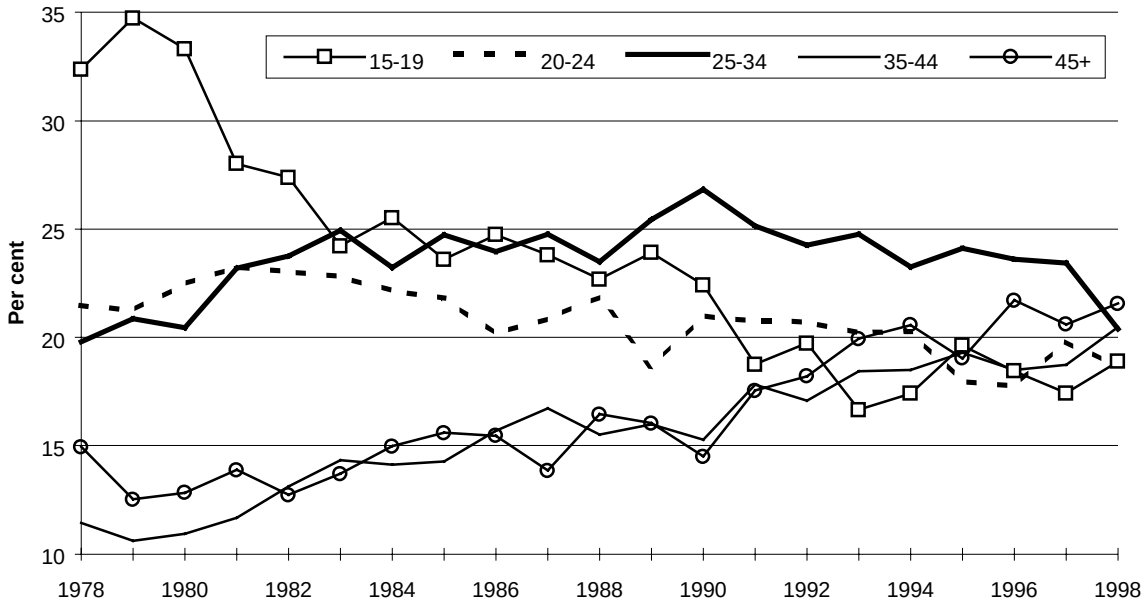
The upward trend in the rate of unemployment and its duration reflects the net outcome of differing experiences among various groups within the labour market. While the prospects and pattern of unemployment have remained much the same for some groups, others have faced significant changes.

Debelle and Swann (1998) highlight the shifting distribution of unemployment across gender and age groups, noting growing unemployment shares among:

- males seeking full-time work
  - this group's share of aggregate unemployment rose from 38 per cent in 1970 to 51 per cent in 1997 (compared to a reduction from 34 to 28 per cent for females seeking full-time work); and
- older workers
  - workers over the age of 35 have accounted for a growing proportion of the unemployed. In contrast, the share of 15 to 19 year olds has nearly halved over the last two decades (figure 4.3).

Figure 4.3 **Age distribution of unemployment, 1978 to 1998[a]**

Per cent of total unemployment



a August observations.

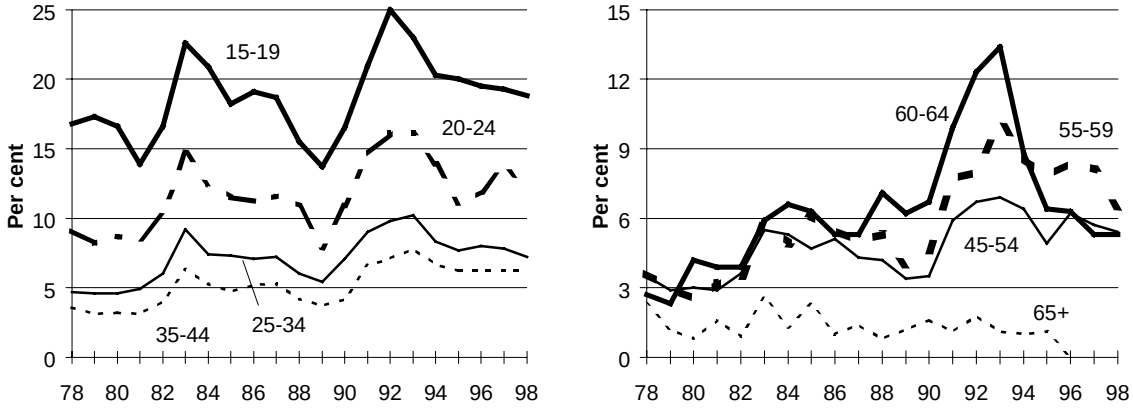
Data source: ABS (*The Labour Force, Australia*, Cat. no. 6203.0).

However, another perspective on the unemployment experience of particular groups can be gained by taking changes in the size of the workforce within each group into account. Such a perspective is given by an analysis of unemployment rates for different groups.

This reveals a very different picture. Unemployment rates have increased for all age groups, except those 65 years and older, with consistently high unemployment rates among the 15 to 19 and 20 to 24 year age groups (figure 4.4). Since 1978, the unemployment rate for 15 to 19 year olds has seldom moved below 15 per cent. However, as seen from figure 4.4, the unemployment rate among young jobseekers has been prone to significant fluctuations over the period. Against this, the unemployment rate among older age groups has trended upwards.

Data on the incidence of unemployment across industries and between Australian born and migrant labour force participants for a selection of years since 1981 is provided in table 4.1. Across industries, the incidence of unemployment has been consistently relatively low in several areas: Community services; Communication services; Finance, property and business services; and the Transport and storage industries. In contrast, a number of industries have recorded consistently high rates of unemployment: Construction; Recreational, personal and other services; and

Figure 4.4 **Unemployment rate by age, 1978 to 1998[a,b]**



a August observations. **b** Reported unemployment rates among males 60 years and over are affected by changes introduced from March 1994. Due to the removal of the activity test for access to unemployment benefits for older long term unemployed males, this group is no longer counted as unemployed for statistical purposes.

Data source: ABS (*The Labour Force, Australia*, Cat. no. 6203.0).

Table 4.1 **Unemployment rates by last industry of employment and migrant status, selected years[a]**

	1981	*1986*	*1989*	*1994*	*1997*
	%	%	%	%	%
Agriculture, forestry, fishing, etc	3.3	4.2	3.4	4.6	5.2
Mining	4.2	4.0	4.5	7.0	4.9
Manufacturing	4.8	6.1	4.1	6.2	5.7
Electricity, gas & water	0.5	2.1	1.4	6.0	4.0
Construction	4.8	7.1	4.1	6.4	5.7
Wholesale & retail trade	4.5	5.2	3.8	4.9	4.4
Transport & storage	2.6	3.0	2.8	4.1	3.7
Communication services	2.0	1.4	1.7	3.7	4.7
Finance, property & business services	1.9	2.6	2.1	2.8	3.1
Public admin & defence	2.5	5.9	2.5	4.1	5.8
Community services	1.8	2.0	1.8	2.0	2.1
Recreational, personal & other services	4.9	6.7	4.3	5.2	5.8
All industries[b]	**5.6**	**8.0**	**5.7**	**9.2**	**8.4**
Born overseas	6.1	8.6	5.9	11.4	9.3
Born in non-English-speaking country	6.3	9.3	6.3	13.7	10.9
Australian-born	5.5	7.7	5.6	8.5	8.1

a August observations. **b** This is the total rate of unemployment at August of these years and includes those unemployed people who could not be attached to an industry of previous employment.

Source: ABS (unpublished data).

Manufacturing. Unemployment rates in the Mining and Wholesale and retail trades industries have also been relatively high in some years. Unemployment rates in the Manufacturing and Construction industries are particularly sensitive to economic downturns. In general, migrants — particularly those with a non-English-speaking background — have higher rates of unemployment than Australian-born workers.

Underemployment and hidden unemployment

While the growth in measured unemployment since the mid 1970s is stark, other forms of labour underutilisation also need to be recognised. These highlight the degree to which labour is not being fully utilised, and the extent to which people in work and those notionally unavailable for work are failing to achieve their employment aspirations.

Two important indicators of labour underutilisation on which the ABS collects data are:

- underemployment
  - focusing on employed people who would prefer to work more hours than their current job provides; and
- hidden unemployment
  - comprising people not formally recognised as participating in the labour market who nevertheless would like to work.

Overall, the share of Australian workers wanting to work more hours has climbed from less than 1 per cent in the early 1970s to levels currently around 7 per cent. This growth has been largely driven by dissatisfaction among part-time workers who make up over 90 per cent of all those wanting additional hours. In August 1998, about one part-time worker in four was in this category compared to one in thirty in 1970. Underemployment among full-time workers — often associated with temporary stand-downs and shortened hours due to insufficient work or upstream industrial action — has generally affected less than 2 per cent of the full-time workforce (ABS *The Labour Force, Australia*: *Historical Summary*, Cat. no. 6204.0).

Estimates of hidden unemployment are obtained from analysis of groups classified by the ABS as being ‘marginally attached to the labour force’. These comprise people unavailable for work in the week targeted by the ABS labour force survey — and therefore not included in official labour force estimates — who are nevertheless interested in working (the bulk of people in this category indicate their availability for work within 4 weeks). Over the last decade, the proportion of the working age

population in this group (between the ages of 15 and 69, and not officially counted as employed or work-ready) has risen from about 20 to 24 per cent. However, of this marginally attached workforce, the share that is actually looking for work has tended to remain below 10 per cent. Including these job seekers in official labour force estimates would, for instance, have added about 0.6 percentage points to the reported unemployment rate of 8.5 per cent in September 1997 (latest available data).

'Discouraged workers' might also be included. These are people who are willing to work, but have given up actively seeking work because they judge their job prospects to be poor. The number in this category tends to rise as labour market conditions deteriorate. The ABS (1997) indicates that about one in seven of the hidden unemployed (who are also not searching for work) fall into this category. For September 1997, the inclusion of discouraged workers would add an additional 118 000 people to the group recognised as wanting a job, thereby raising the reported unemployment rate by a further 1.3 percentage points.

4.2 Underlying changes in the labour market

A range of factors underlie the growth in unemployment observed in Australia since the early 1970s. Fundamentally, Australia's rising unemployment rate has occurred because the number of people seeking jobs has grown faster than the economy's ability to supply them. There are a number of elements to this story which represent social and economic change in their own right. Population growth and an increase in the share of the working age population seeking work has underpinned strong growth in labour supply. Rising education levels within the population has increased the availability of skilled labour, and reduced the job prospects of those with less education and fewer skills. Meanwhile, the sources of job growth (and associated skill requirements) within the economy are also changing as industries grow at different rates. These elements are discussed below.

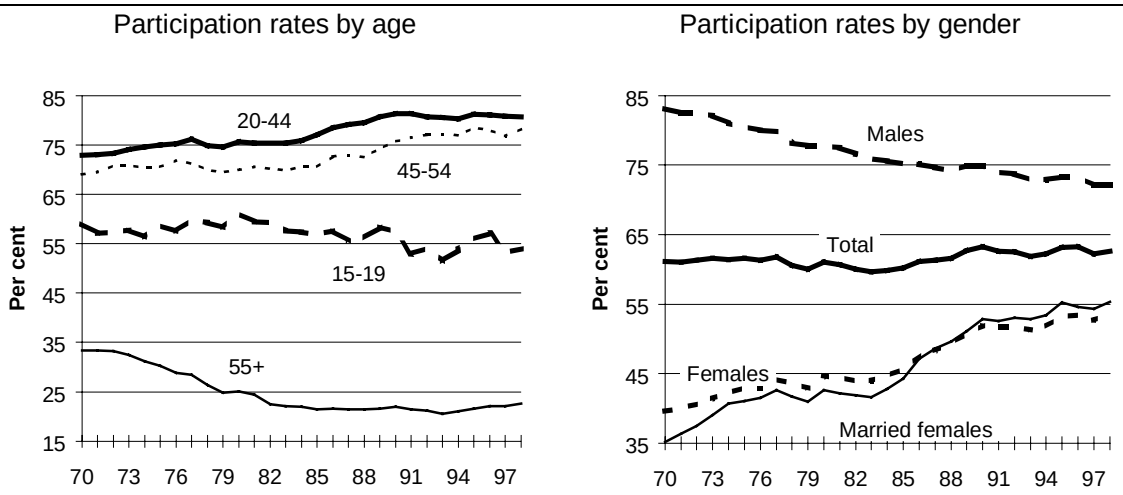
Population growth and participation rates

Since 1970, Australia's working age population has increased both absolutely and as a share of the total population. Between 1970 and 1997, the number of people aged 15 years and over increased from 9.3 million to 14.6 million, and this group's share of the population rose from around 71 to 79 per cent. This increase, in combination with a slight increase in the overall labour force participation rate, has led to an increase in the number of jobseekers. In fact, decomposition of labour force changes

suggests population growth has been the key factor fuelling growth in the labour force in each year since 1991-92 (ABS, *Year Book Australia*, various years).

Australia's overall labour force participation rate has shown only a modest upward trend since 1970 (varying within a band of about 4 percentage points over the period). However, there have been important changes in the participation rates of some groups (figure 4.5).

Figure 4.5 **Labour force participation rates by age and gender, 1970 to 1998[a]**



a August observations.

Data source: ABS (*The Labour Force, Australia*, Cat. no. 6203.0).

Notable changes include:

- Increased participation by women, particularly married women, in the labour market (with significant increases occurring in the early 1970s and the middle to late 1980s);
  - Norris and Wooden (1996, p. 2) describe the increase in the labour force participation rate of married females as so large '… as to render it one of the most significant labour developments during the last 25 years, and certainly one with profound economic and social effects.' Factors underlying this increase include:
    - improved female wage relativities;
    - declining family size;
    - increased education among women;
    - better access to child care services;
    - more flexible working arrangements; and

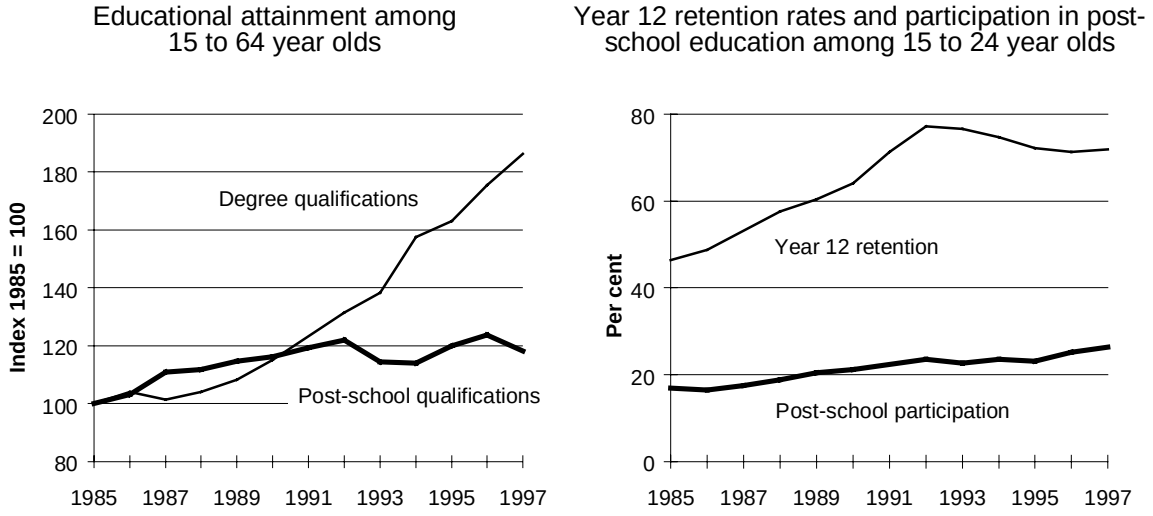
    - greater community acceptance of women in the workforce (Kenyon and Wooden 1996);
- A decline in the labour force participation rate of young people (particularly from the 1980s onwards);
  - linked to increased school retention rates, progression to tertiary education and lack of employment opportunities (Kenyon and Wooden 1996, p. 23, for instance, refer to the 'collapse' of the full-time jobs market for young people); and
- Declining labour force attachment among older people — 55 years and over (with the sharpest declines occurring in the 1970s).
  - Borland (1995) found that declining job opportunities for older males have, since the early 1980s, become an increasingly important factor in their departure from the job market.

Educational attainment

Education has an important influence on the quality of labour and, as mentioned in the previous section, also affects the age-profile of those looking for and entering work. Although differences in collection methods and definitions affect comparison of data between the 1970s, 1980s and 1990s, a strong pattern of skill upgrading emerges.

Census data indicate that, in 1971, only 20 per cent of the population over the age of 15 had post-school qualifications, including 13 per cent with technical qualifications and 2 per cent with degrees. Twenty-five years on, ABS surveys indicate that the share of 15 to 64 year olds with post-school qualifications has risen to about 42 per cent, with particularly rapid expansion in the number of university graduates who now represent over 10 per cent of people in this age group. Growth in technical education has been more modest, with about 14 per cent of 15 to 64 year olds possessing these qualifications. Even over the last decade, the proportion of the population with post-school qualifications has risen by over 20 per cent and the proportion of degree holders has risen by over 40 per cent. The proportion of young people staying on for further schooling and pursuing post-school education has also grown (figure 4.6).

Figure 4.6 **Educational attainment and participation, 1985 to 1997[a]**



[a] Data for 1993 and beyond are affected by exclusion of some basic certificate/diploma awards which are no longer counted as post-school qualifications.

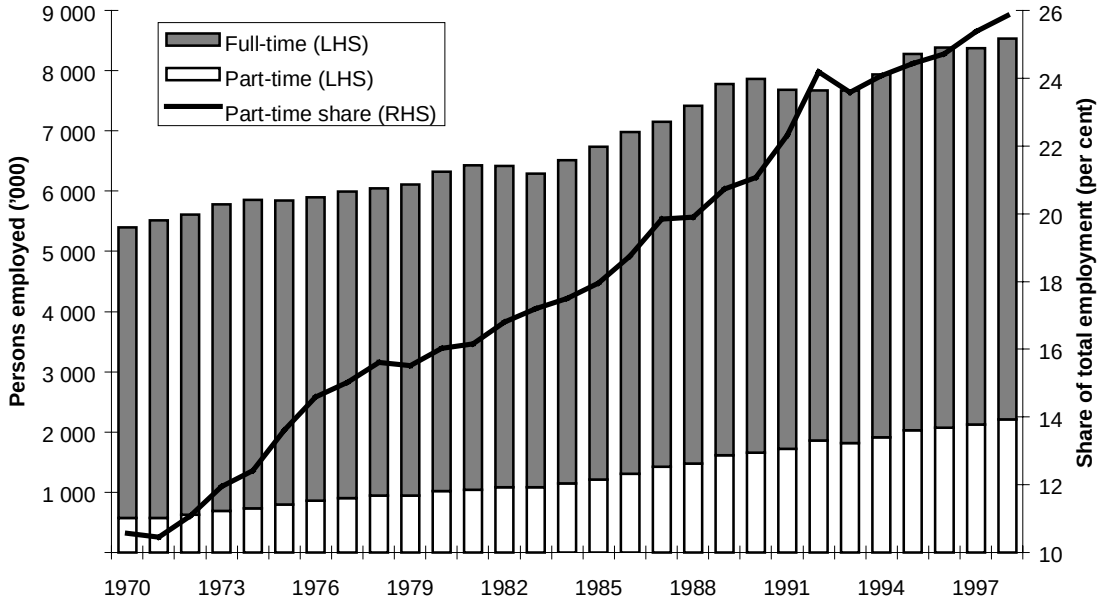
Data source: ABS (*Australian Social Trends*, Cat. no. 4102.0).

Growth in part-time employment

A distinctive feature of the change in work patterns over the last few decades has been the significant growth in part-time and casual employment. Figure 4.7 shows the rapid growth of part-time employment (defined as less than 35 hours of work per week) since the early 1970s. Between 1970 and 1998, the number of part-time jobs nearly quadrupled (with 1.6 million jobs being created), compared to an expansion of about 30 per cent (or 1.5 million jobs) in the full-time market. As a consequence, the proportion of workers in part-time jobs increased from about 10 to 26 per cent over the period.

The growth in part-time employment has provided people with greater flexibility in combining work and other activities, and has been identified by Dawkins and Norris (1995) as a significant factor in bolstering observed labour force participation rates — particularly among married women and students. However, Debelle and Swann (1998, p. 7) point out that, while the strong growth in part-time employment for women has been widely publicised, the growth of part-time employment for males has been more than double that of females over the last 10 years.

Figure 4.7 **Full and part-time employment, 1970 to 1998[a]**



a August observations.

Data source: ABS (*The Labour Force, Australia,* Cat. no. 6203.0).

Changes in skill and occupational requirements

Various studies (Borland and Foo 1994; Debelle and Swann 1998; Lewis and Seltzer 1996) suggest that technological change and shifts in the demand for goods and services are influencing the pattern of demand for particular skills. These factors, in combination with supply-side influences, are driving a steady advance in skill levels among jobholders. Data from the ABS labour force survey indicate that the proportion of workers with post-secondary school qualifications grew steadily from about 38 to 51 per cent between 1979 and 1996.

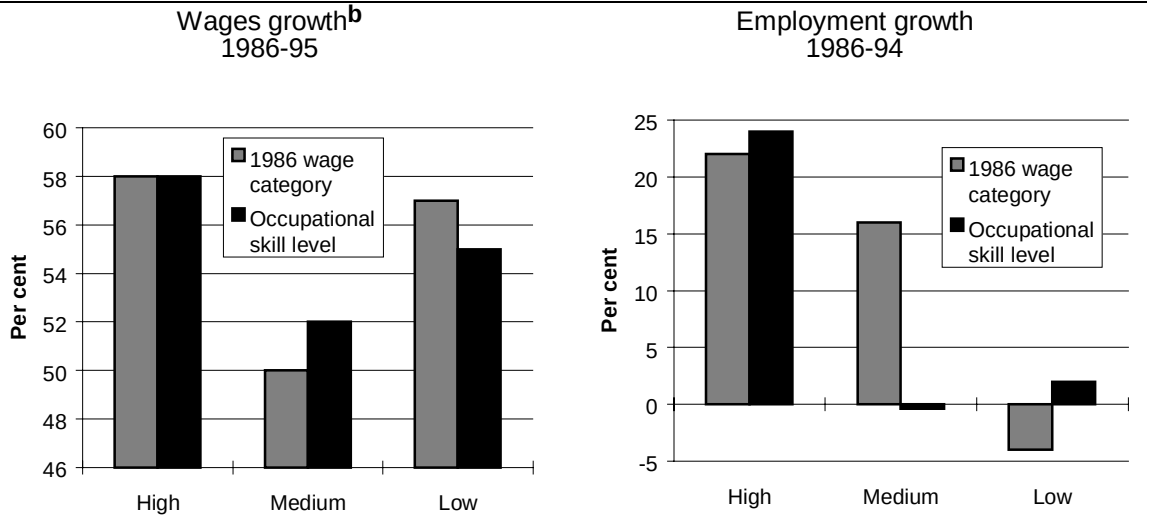
A recent OECD (1997) study found a consistent pattern of strong growth in white-collar employment (encompassing both high and low skill workers) across a broad range of developed countries, including Australia, with particularly strong demand for highly skilled workers. This contrasted with the pattern of demand for skilled blue-collar workers (eg tradespeople). For many countries, including Australia, New Zealand, France and Japan, demand for skilled blue-collar workers registered the largest declines. Of the countries studied, only the USA and Germany saw growth in employment for high skill blue-collar workers.

For Australia, EPAC (1996), pointed to structural change and technical progress as key drivers of growing earnings dispersion and what Gregory (1993) described as

the ‘disappearing middle’. In essence, labour market trends over the past 20 years have seen a widening gap between the highest and lowest incomes and an increasing proportion of wage and salary earners located at each end of the earnings spectrum. The OECD (1993) identified similar trends among many member countries since the 1970s. According to EPAC (1996), the increasing polarisation of earnings in Australia has come about primarily through growth in high-wage, high-skill jobs. This phenomenon is captured in figure 4.8 which shows wage and employment growth for people in high, middle and low skill and income groups spanning the decade from the mid-1980s.

While aggregate wage relativities have not changed much over the period (and real unit labour costs have been fairly stable over the past 2 decades), large disparities have opened up in the growth of high, medium and low skill jobs. Technological change appears to be expanding demand in favour of skilled labour (Borland and Foo 1994). Slow job growth at the low and medium skill end of the job market, combined with rigidities in the wages system, have seen growing unemployment in these skill groups. And, while the nature of job opportunities within industries has been changing, so has the distribution of opportunities across industries. As discussed below, patterns of employment growth have changed markedly over the past few decades in response to structural factors.

Figure 4.8 **Wages and employment growth, by wage and skill group[a]**



a ‘High skill’ refers to managerial and professional workers; ‘medium skill’ refers to para-professionals and tradespersons; and ‘low skill’ refers to clerks, salespersons, personal service workers, plant and machine operators and drivers, labourers and related workers. **b** Wages growth refers to average male full-time adult ordinary time earnings.

Source: EPAC (1996, table 6.1).

Changing employment opportunities across industry

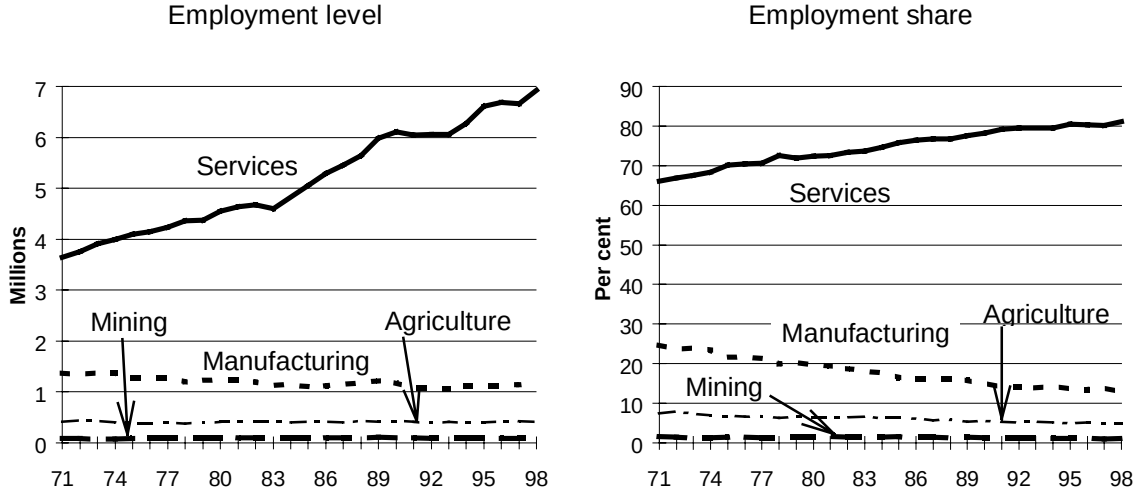
The pattern of job opportunities in Australia since 1971 has been dominated by growth in the services industries where employment rose by almost 90 per cent (or around 3.3 million jobs). As highlighted in chapter 2, growth in the services sector's share of employment and output is typical of the experience of other developed countries over the period. But while the fall in the employment share of Australia's agriculture sector has been accompanied by a marginal increase in the number of jobs, mining and manufacturing have experienced both a loss of share and an absolute decline in employment. Manufacturing employment has fallen from around 1.4 million jobs at the start of the 1970s to around 1.1 million jobs in recent years — reducing its employment share from about 25 to 13 per cent (figure 4.9).

Disaggregation of these sectoral trends shows that some industries have grown rapidly, while others have exhibited much slower growth and even absolute declines. Moreover, the pattern of change has varied over time. Table 4.2 highlights the mixed pattern of industry employment growth from the beginning of the 1970s.

Industries that have undergone significant proportionate *declines* in employment between 1971 and 1998 include:

- Textiles, clothing and footwear (with a reduction in job numbers of 47 per cent);
- Transport equipment and machinery (40 per cent);
- Electricity, gas and water (33 per cent);
- Metallic products (19 per cent); and

Figure 4.9 **Sectoral employment levels and shares, 1971 to 1998[a]**



a August observations.

Data source: ABS (*The Labour Force, Australia*, Cat. no. 6203.0).

- Non-metallic-mineral products (10 per cent).

In contrast, proportionately large employment *increases* were achieved by industries engaged in:

- Finance, property and business services (219 per cent);
- Community, education and personal services (149 per cent);
- Public administration and defence (58 per cent);
- Wholesale and retail trade (58 per cent); and
- Construction (33 per cent).

Overall, employment growth has been stronger in the 1980s than in the 1970s and 1990s, with average annual growth rates double that estimated for the 1970s (table 4.2). Again, however, the experience of different industries varies. For a range of industries, sizeable declines in employment experienced in the 1970s have been moderated in later decades. For example, employment in the TCF industries exhibited an average annual rate of decline of about 5 per cent between 1971 and 1979, but displayed modest growth over the 1980s, before experiencing a sharp decline in the 1990s.

For some other industries, rapid increases in employment during the 1970s were followed by much slower rates of annual growth — and even decline. For example, employment in Public administration and defence recorded an average annual rate of growth of over 4 per cent during the 1970s, slowing to under 2 per cent in the 1980s and declining employment in the 1990s. The Electricity, gas and water industry experienced an even sharper turnaround, with average annual rates of growth of around 2, -1.4 and -6.3 per cent in the 1970s, 1980s and 1990s respectively.

Some industries have periodically experienced high levels of employment volatility. TCF industries were notable in this regard in the 1970s, exhibiting almost 5 times the variability of the Wholesale and retail and Other manufacturing groups and twice that of Mining, Transport equipment and machinery and Electricity, gas and water. By comparison, Finance, property and business services experienced high employment variability during the 1980s — associated with strong employment growth throughout the decade. Since 1990, the Electricity, gas and water industry has experienced the greatest year-to-year employment variability — associated with a sizeable decline in employment.

Table 4.2 **Employment changes within sectors and industries, 1971–1997**

Table 4.2 **Employment changes within sectors and industries, 1971 to 1998**[a]

	Employment		*1971 to 1998*			*1971 to 1979*			*1980 to 1989*			*1990 to 1998*		
Sector/industry	*1971*	*1998*	*Change*	*Growth*[b]	*CV*[c]	*Change*	*Growth*[b]	*CV*[c]	*Change*	*Growth*[b]	*CV*[c]	*Change*	*Growth*[b]	*CV*[c]
	'000	'000	%	%	%	%	%	%	%	%	%	%	%	%
Agriculture	**412**	**418**	**1.4**	**0.1**	**3**	**-3.2**	**-1.3**	**5**	**0.5**	**0.2**	**2**	**-2.1**	**0.2**	**2**
Mining	**89**	**87**	**-2.4**	**0.6**	**10**	**-8.4**	**-0.1**	**7**	**24.7**	**1.4**	**6**	**-8.5**	**-1.4**	**5**
Food, bev & tobacco	202	185	-8.4	-0.5	8	-4.5	-0.8	4	1.4	-0.7	7	1.4	0.5	4
TCF	175	92	-47.3	-1.9	18	-30.9	-4.9	14	2.1	0.7	5	-14.7	-0.8	5
Non-metallic min prods	60	54	-10.3	-0.4	8	-17.0	-2.4	8	-8.1	-0.3	5	3.3	-0.8	7
Metallic products	230	187	-19.0	-1.1	11	-10.8	-1.6	6	-5.1	-1.7	9	-2.9	0.1	5
Trans equip & machry	361	218	-39.7	-1.8	16	-12.2	-2.0	7	-14.8	-2.0	10	-19.5	-0.5	8
Other manufacturing	337	369	9.5	0.3	5	1.7	-0.2	3	10.1	1.2	5	-0.8	0.5	4
Manufacturing	**1 365**	**1 104**	**-19.1**	**-0.8**	**8**	**-10.0**	**-1.6**	**5**	**-1.9**	**-0.5**	**4**	**-6.2**	**0.1**	**3**
Electricity, gas & water	103	69	-32.5	-1.2	18	15.6	2.0	7	-12.4	-1.4	9	-33.4	-6.3	18
Construction	470	624	32.8	0.9	11	-0.3	0.0	4	24.2	2.4	12	6.2	1.5	6
Wholesale and retail	1 114	1 760	58.0	1.8	15	10.7	1.0	3	25.3	2.6	9	9.8	1.4	4
Transport and storage	294	379	28.9	0.9	9	17.6	1.9	6	15.1	1.0	4	-2.2	0.3	4
Communications	118	151	28.0	0.8	10	7.7	0.9	4	27.7	2.5	9	-2.1	1.5	10
Fin, property & bus	395	1 258	218.6	4.8	37	23.6	2.9	8	82.4	7.1	21	29.2	3.7	11
Comm, edn & personal	948	2 356	148.6	3.3	26	39.0	4.3	11	32.9	3.3	10	21.7	2.4	7
Public admin & defence	208	330	58.3	1.8	16	30.0	4.3	12	14.5	1.8	7	-9.4	-0.7	6
Services	**3 649**	**6 927**	**89.8**	**2.4**	**19**	**19.7**	**2.3**	**6**	**31.5**	**3.1**	**10**	**13.4**	**1.8**	**5**
All industries	**5 516**	**8 536**	**54.8**	**1.7**	**6**	**10.2**	**1.1**	**3**	**22.8**	**2.3**	**7**	**9.3**	**1.5**	**4**

[a] Based on August observations. [b] Growth in this table refers to the average annual growth rate over the relevant time period. [c] CV refers to the coefficient of variation, which is calculated by dividing the standard deviation of a series by the average value of that series. It is a measure of proportional variation and can be used to make interindustry comparisons. The figures reported in the table have been multiplied by 100.

Sources: ABS (*The Labour Force, Australia*, Cat. no. 6203.0; *The Labour Force, Australia: Historical Summary*, Cat. no. 6204.0).

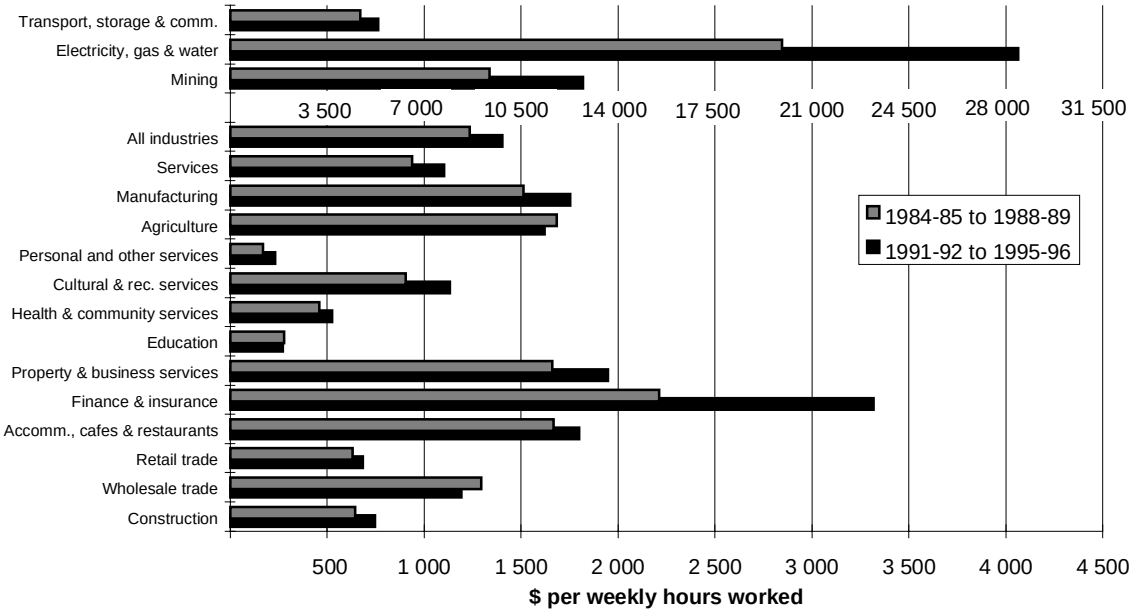
The competitiveness of firms and industries have an important bearing on their growth prospects and demands for labour and other inputs. Investment in new capital equipment or the upgrading of existing equipment and facilities provides opportunities for introducing new or improved products and processes to enhance competitiveness. Such investment may be used to reduce the amount of labour used (ie to substitute capital for labour), but can also lead to an increase in the amount of capital available to an existing workforce. In each case, the amount of capital available per worker would increase (ie capital deepening). However, while expanding capital relative to labour may lead to a decline in some employment, it need not result in a net loss of jobs in the economy as a whole. The total effect of investment on employment is also influenced by the flow-on effects of improved competitiveness. For example, growth in one industry can also promote employment growth in other upstream supplying industries.

To illustrate the extent of capital deepening that has occurred in Australia since 1984-85 (the earliest available data), changes to the business capital stock per person employed (adjusted for hours worked) between the 1980s and 1990s are reported in figure 4.10. All sectors, except for agriculture, experienced some capital deepening, most notably the mining sector which also experienced a decline in employment over this period. Likewise, capital relative to labour increased by 43 per cent in the Electricity, gas and water industry while employment levels declined significantly. The decline for agriculture can be attributed to a run down in stocks in the later period related to lower rates of investment as a result of tight liquidity conditions across many key agricultural industries (ABARE, various years).

Yet large percentage increases in capital deepening were also associated with large employment growth within some industries. For example, Finance and insurance increased its capital to labour ratio by 50 per cent and also enjoyed strong employment growth at the same time. Similarly, capital deepening increased by almost 40 per cent in the Personal and other services industries — another industry which experienced strong employment growth. Conversely, over the 1984-85 to 1995-96 period, employment growth occurred in the Wholesale trade and Education industries, although there was a decline in capital stock per worker of 8 and 3 per cent respectively.

Figure 4.10 **Business net capital stock[a] per weekly hour worked[b] by sector and industry, selected years[c,d,e]**

1989-90 prices



a Private enterprises and public trading enterprises non-dwelling construction and equipment stock excluding stocks owned by general government and public financial enterprises. Also excludes dwellings and real estate transfer expenses. **b** Aggregate weekly hours worked for private and public sectors. **c** 1984-85 data are the earliest available. **d** The data are reported as average ratios over the five year periods reported in the figure. **e** The ratio was calculated by using net capital stock data for private enterprises and public trading enterprises only as capital stock data for general government and public financial enterprises are unavailable by industry. The hours worked data cannot be split between the main segments comprising the public sector (ie general government, public financial enterprises and public trading enterprises). As a result, hours worked in the general government and public financial enterprises segments are included. Consequently, the extent of capital deepening is understated.

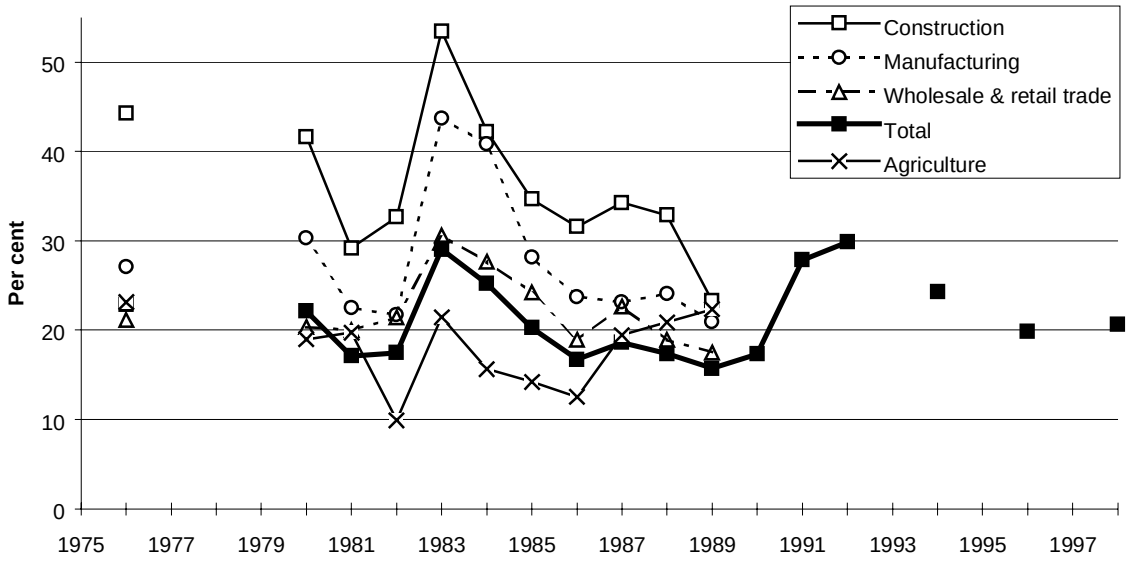
Data sources: PC estimates based on ABS (*Australian National Accounts: Capital Stock*, Cat. no. 5221.0; *The Labour Force, Australia*, Cat. no. 6203.0).

The incidence of dismissal

As structural change has led to a contraction of employment in some industries, it is interesting to examine the extent to which job decline has been associated with retrenchment. While voluntary job separation normally suggests that a job holder is moving on to better things (or at least expects this to be case), involuntary movements imply a higher level of personal cost being borne by the worker.

Figure 4.11 shows the share of involuntary job separations occurring in a particular year, and how this proportion (of total job leavers) differs across some industries and through time. The data highlight the variable nature of retrenchment rates (incorporating the effect of both lay-offs and business closures).

Figure 4.11 **Involuntary job separations as a share of total job separations, by industry, 1976 to 1998[a,b,c]**



a Involuntary job separations refer to those workers who separated from their last job because of a lay-off or business closure. **b** Based on the year to February of the year shown in the figure. **c** Breaks in the series reflect years in which the survey was not conducted. Job separation data by industry are not available after 1989.

Data source: ABS (*Labour Mobility, Australia*, Cat. no. 6209.0).

As expected, the share of people who leave their jobs due to retrenchment tends to rise sharply in times of economic downturn, with peaks occurring in the early 1980s and 1990s. For the job market as a whole, in peak years, about 30 per cent of people who left jobs in the previous 12 months (the survey is conducted in February) did so due to dismissal or business closure. In more buoyant times, the overall retrenchment rate lies around 15 to 20 per cent. Importantly, there has been no obvious upward trend in the overall retrenchment rate since 1976. For the labour market in aggregate, the great majority of job separations are voluntary rather than involuntary — this is true for most industries, even in periods of economic downturn.

Nonetheless, data available between 1976 and 1989, show significant interindustry variation in the rate of involuntary job separations. Typically, Construction and Manufacturing lie well above the average for the economy as a whole (reflecting significant variability in activity levels for these industries), while Agriculture has tended to lie below it. However, in the latter half of the 1980s this changed. From 1987 to 1989, the proportion of retrenchment-related separations from Agriculture climbed above that for the economy as a whole.

The ABS recently released the results of a survey of people who were retrenched or made redundant in the three years to June 1997 (ABS 1998c). During this period, 685 400 people were retrenched or made redundant (on one or more occasions). This represented 7 per cent of the total number of people who held jobs during the period. The main reasons for retrenchment/redundancy were: insufficient work/job cuts (46 per cent); business closure (15 per cent); and a change of management (8 per cent).

The industries accounting for the largest numbers of retrenched workers were: Manufacturing (24 per cent of all retrenched workers); Retail trade (12 per cent) and Construction (9 per cent). Manufacturing and Construction also recorded amongst the highest rates of retrenchment/redundancy, although the industry with the highest rate of retrenchment was Electricity, gas and water (30 per cent). The three industries with the lowest rates of retrenchment were: Education (4 per cent); Health and community services (5 per cent); and Personal and other services (8 per cent).

Other characteristics of those who were retrenched or made redundant in the three years to June 1997 were:

- 71 per cent had held permanent jobs;
- 56 per cent did not hold post-school qualifications;
- 38 per cent had been in their job for one year or less and a further 14 per cent had been in their job for over one year but less than two years; and
- 57 per cent of workers came from relatively low-skilled occupational groups.

Of the 685 400 retrenched/redundant workers, 55 per cent (374 900) had found new jobs by July 1997. Of the remaining 310 500 persons, 65 per cent were unemployed while 35 per cent had withdrawn from the labour force. Among those who had been successful in obtaining employment, about 25 per cent (who had previously held permanent jobs) had been re-employed on a casual basis. A similar proportion had moved from occupying full-time jobs to accepting part-time jobs.

4.3 Labour mobility

The capacity of the labour market to adjust to changes in the demand for labour and accommodate changes in the job preferences of workers is influenced, in part, by the extent and ease of labour mobility or turnover. To the extent that wage flexibility is constrained by institutional and social arrangements, job movements become more important in the adjustment process. However, mobility also involves costs for both employees and employers. For employees, there are the search and

other adjustment costs (both social and economic) associated with job movements, while employers bear costs in terms of loss of experience, recruitment and extra training requirements.

Mobility has several elements — it can involve a change of job between firms in the same industry, a movement between firms in different industries, or a change in occupational type. It may also involve a change in location. Where industries and/or regions are subject to general decline, the potential for interindustry and locational mobility are important for accommodating adjustment. The locational aspect of mobility was examined chapter 3. The subsequent discussion addresses: the extent of labour mobility; changes in the pattern of mobility; and the main characteristics of mobile workers.

The incidence of job movement

The labour market is characterised by a sizeable rate of job turnover each year. Based on the latest ABS labour mobility survey of an estimated 8.4 million people working in February 1998, 14 per cent (1.2 million people) had changed jobs during the preceding 12 months. Of those with jobs in February 1998, 8 per cent (700 000 people) had previously been unemployed or outside the labour force. Hence, almost 2 million job holders in February 1998 (22 per cent of all job holders) had been job seekers in the previous year. On this basis, the equivalent of the entire labour force finds a new or different job every four to five years.

The bulk of job changes involving the 1.2 million people who had been previously employed over the year ending February 1998 involved movements *within* existing industry and occupational groups. Nevertheless, there were sizeable job movements between firms in different industries (462 400 or 40 per cent of these job movers) and between occupational groups (393 800 or 34 per cent of these job movers).

An examination of the job tenure status of workers indicates that, in February 1998, about 34 per cent of workers had been in their current job for less than 2 years, 25 per cent for between 2 to less than 5 years and 41 per cent for in excess of 5 years. Hence, it is apparent that job movements occur around a relatively stable core within the workforce.

An examination of mobility trends among jobholders since 1972 (figure 4.12) suggests that:

- the year-to-year variability in job turnover strongly reflects cyclical factors — rates of turnover tend to decline during economic downturns (such as occurred in

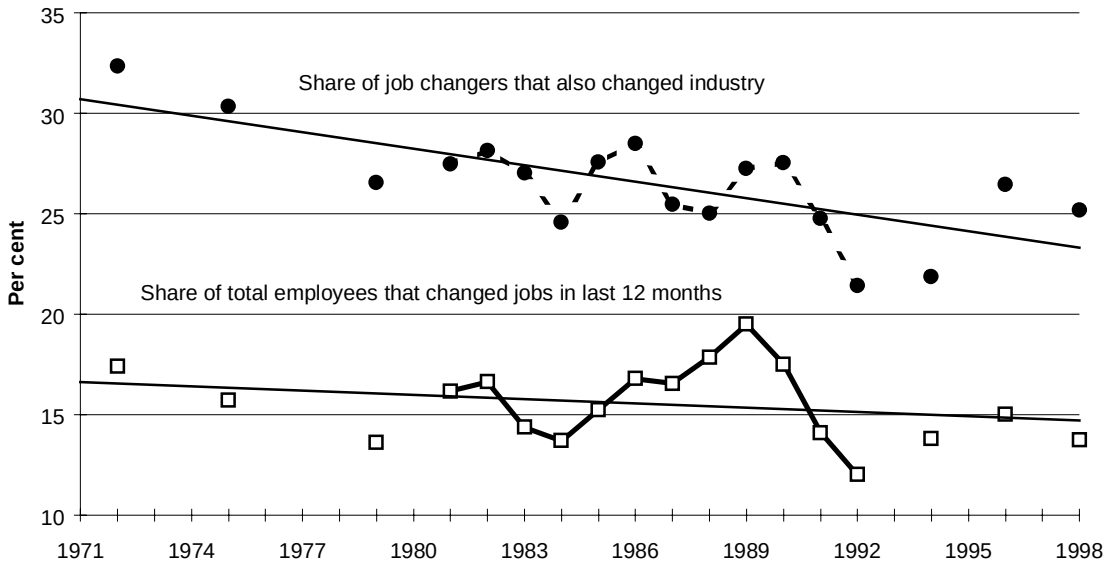
1974–75, 1982–83 and 1990–92) and increase during periods of economic buoyancy;

- if cyclical variations are discounted, the aggregate job turnover rate has displayed a rather weak downward trend over the period — it is common for between 13 and 17 per cent of employed people to change jobs within a 12 month period; and
- while also subject to variability, there has been an apparent trend towards fewer between-industry job movements and correspondingly more within-industry job movements over time.

Kilpatrick (1994) suggests that the apparent decline in interindustry mobility may be at least partly attributable to a decline in the transferability of skills. Skills that are highly industry specific, because they are linked to specialised technologies or industry practices, may have little value to employers in other industries. Workers with such skills may find it increasingly difficult to move to other industries at equivalent levels of remuneration or, when their skills are heavily discounted, may find themselves competing in the semi-skilled or unskilled labour pool.

Analysis of interindustry flows highlights variations in job movement to and from

Figure 4.12 **Jobholder turnover[a] and interindustry mobility[b] rates, 1972 to 1998[c]**



a Jobholder turnover occurring in previous 12 months as a proportion of end-of-period employment. **b** Inter-industry job movements that occurred in previous 12 months as a proportion of end-of-period employment. **c** Based on the year to February of the year shown in the figure.

Data source: ABS (*Labour Mobility, Australia*, Cat. no. 6209.0).

particular industries (table 4.3). Although transfer rates vary between years in response to economic conditions and a host of other factors, relatively high proportions of employees in the Wholesale and retail trade and Recreational and personal services industries move to other industries in the course of a year. At the

Table 4.3 **Interindustry labour mobility for selected industries, during year to February 1988, 1992 and 1998**

Table 4.3 Interindustry labour mobility for selected industries, 1988, 1992 and 1998[a]

	1988			*1992*			*1998*[b]		
Industry	*Total who worked at some stage during the year*	*Transfers to other industries*	*Transfers from other industries*	*Total who worked at some stage during the year*	*Transfers to other industries*	*Transfers from other industries*	*Total who worked at some stage during the year*	*Transfers to other industries*	*Transfers from other industries*
	'000	%	%	'000	%	%	'000	%	%
Agriculture	421.7	3.7	3.7	394.8	3.4	2.9	406.5	3.8	3.0
Manufacturing	1 169.6	6.8	6.4	1 146.9	4.2	3.4	1 104.3	5.2	4.7
Construction	496.3	6.2	7.1	547.7	4.2	4.3	589.7	4.4	5.9
Wholesale & retail trade[c]	1 395.6	7.1	6.0	1 566.6	4.9	4.2	1 693.8	6.7	5.4
Transport & storage	395.2	6.8	7.0	393.3	3.8	4.3	401.2	3.7	5.6
Finance, business, property[d]	742.1	6.8	8.6	873.2	4.0	4.9	1 135.0	5.9	8.4
Public administration[e]	351.5	6.6	4.7	371.5	4.5	2.8	365.4	4.9	4.6
Community services	1 239.4	3.6	3.9	1 434.1	2.1	2.9	..	..	..
Rec & personal services	496.5	9.3	8.8	601.0	5.2	6.3	..	..	..
Total	7 083.7	6.1	6.1	7 684.2	3.9	3.9	8 231.2	5.5	5.5

a Based on observations for the year to February in each case. **b** Some data are not reported due to industry classification changes (from the Australian Standard Industrial Classification to the Australian and New Zealand Standard Industrial Classification) which affect the consistency of estimates between years. **c** In 1998, the relevant figures were calculated by summing Wholesale trade and Retail trade. **d** In 1998, the relevant figures were calculated by summing Finance and insurance and Property and business services. **e** Government administration and defence was used in 1998.

Source: ABS *(Labour Mobility, Australia*, Cat. no. 6209.0).

other end of the scale, workers engaged in Agriculture, Community services and Transport and storage appear to have relatively low rates of interindustry mobility.

More disaggregated data point to job movement occurring more readily between related fields, moderated by competition from new labour market entrants. For instance, during the year ending February 1998, of the estimated 31 600 people that joined the Finance and insurance industry, about 13 800 had not been working 12 months earlier. Of the remaining 17 800 that came from other industries, about 33 per cent had jobs in Property and business services and 17 per cent had jobs in the Retail trade industry. Manufacturing contributed only about 3 per cent of workers migrating to the Finance and insurance industry.

The differing pattern of transfers between industries suggests that employees from some declining industries may experience greater difficulty than others in crossing over to expanding industries. This has implications for the capacity of some workers to adjust to the shifting pattern of employment growth that is commonly associated with structural change. Workers in declining industries that have skills and experience that are valued in other activities (and ideally, can find employment in those activities in their local area) are likely to be much less disadvantaged by structural change than workers with a narrower range of re-employment opportunities, or those who must move to another location in order to find work.

Other mobility characteristics

ABS data on the characteristics of job changers and new employees, presented in table 4.4, highlight other characteristics that can influence the mobility (or employability) of workers. In general, over the period 1986 to 1998, significant gender-based differences in job mobility are not apparent. Job mobility has been consistently lower for:

- persons over the age of 35 years;
- workers born in non-English-speaking countries (workers born in other English-speaking-countries exhibit similar mobility rates to Australian-born workers); and
- workers without post-school qualifications.

As noted in the context of interindustry mobility, the lower level of job movement of workers with these characteristics — indicating reluctance to move, fewer attractive job options or both — suggests that people in these groups are likely to find it harder to recover from job losses and dislocations arising from structural changes than others. Characteristics affecting the willingness of particular groups to

move to new locations in order to find work, such as family and social attachments and the need to care for school-age children, are also relevant.

Table 4.4 **Job mobility and worker characteristics, 1986 to 1998**

Employment cohort[a]	*Share of cohort that changed jobs in the last 12 months*				
	1986	*1990*	*1994*	*1996*	*1998*
	%	%	%	%	%
Aged 15 to 19 years	26.6	25.4	19.0	20.7	17.6
Aged 20 to 24 years	26.9	29.5	24.1	26.6	25.2
Aged 25 to 34 years	19.2	21.7	17.8	19.8	18.5
Aged 35 to 44 years	13.8	15.5	12.4	13.0	12.0
Aged 45 to 54 years	8.3	9.8	9.0	9.0	8.7
Aged 55 to 69 years	5.0	6.4	4.5	6.0	5.0
Female	16.7	18.1	14.0	15.2	14.0
Male	16.9	18.6	14.9	16.2	14.5
Born in Australia	16.9	18.6	15.1	16.2	14.7
Born outside Australia	16.6	17.7	12.8	14.4	13.2
Born in non-English-speaking country	12.6	14.1	10.7	11.5	10.4
With post-school qualifications	17.5	18.6	15.0	16.9	15.0
Without post-school qualifications	16.5	18.4	14.3	14.9	13.9

a Consists of persons in the relevant cohort who had worked at some stage during the year to February of the year shown in the table.

Sources: ABS (*Labour Mobility, Australia*, Cat. no. 6209.0; unpublished data).

A Measuring structural change

This appendix provides a brief description of the structural change indexes (SCI) reported in chapter 2, along with a discussion of data sources and issues related to measuring structural change. It also provides some background data on the industry structures of the selection of OECD countries and the newly industrialised Asian economies discussed in chapter 2.

A.1 Structural change index

A commonly used method of measuring structural change in output (and employment) is the rate or coefficient of (compositional) structural change, often referred to as a SCI. The SCI for output may be defined as half the sum of the absolute value of the differences in value-added shares over time. The calculation is given by the formula:

$$SCI = \frac{1}{2}\sum \left| x_{i,t} - x_{i,t-1} \right|$$

where $x_{i,t}$ and $x_{i,t-1}$ represent each industry's share of total value-added at time (t) and (t-1), respectively. The use of absolute values ensures that positive and negative changes in industry shares do not cancel each other out when the values are summed across industries. The SCI is bounded between zero and 100, with zero representing no structural change while 100 indicates a complete reversal of structure (OECD 1994).

When making cross-country or cross-regional comparisons of structural change it is important to use data that compare like with like. In addition, the resulting indexes are sensitive to a number of factors which need to be taken into account when measuring and interpreting the SCIs. These include:

- the level of industry aggregation;
- time periods chosen for comparison; and
- price movements.

These issues are discussed in more detail below. Box **A.1** provides two illustrative examples of how to derive and interpret SCIs. The examples also demonstrate how SCIs can be sensitive to the level of industry aggregation.

Box A.2 **Understanding SCIs — some illustrative examples**

The examples below provide an illustration of how structural change is measured and interpreted. In the first example, the economy comprises four main sectors. The resulting SCI is 25 (see last column). This suggests that over the twenty year period from 1970 to 1990, a quarter of the economies resources were reallocated between sectors. In this case, the services sector has expanded more rapidly than other sectors of the economy so that it uses 25 per cent more of the nation's total resources, while the other sectors are using 25 per cent less.

Example 2 illustrates how the estimated SCI can be affected by the level of industry aggregation. In this case, the manufacturing sector has been divided into two industries. Processed food has grown rapidly while other manufacturing has declined in absolute terms. As a result, the SCI is 31, 6 percentage points higher than in example 1, reflecting the additional reallocation of resources that has occurred within the manufacturing sector.

Example 1: Four sector economy

Industry	Value-added ($m)		Industry output shares (%)		Change	SCI
	1970	*1990*	*1970*	*1990*	% pt	
Agriculture	12 000	24 400	12.0	6.1	-5.9	
Mining	1 200	4 000	1.2	1.0	-0.2	
Manufacturing	41 800	91 600	41.8	22.9	-18.9	
Services	45 000	280 000	45.0	70.0	25.0	
Total	**100 000**	**400 000**	**100.0**	**100.0**		**25.0**

Example 2: Five sector economy

	1970	*1990*	*1970*	*1990*		SCI
Agriculture	12 000	24 400	12.0	6.1	-5.9	
Mining	1 200	4 000	1.2	1.0	-0.2	
Manufacturing:						
Processed food	12 540	74 044	12.5	18.5	6.0	
Other manufacturing	29 260	17 556	29.3	4.4	-24.9	
Services	45 000	280 000	45.0	70.0	25.0	
Total	**100 000**	**400 000**	**100.0**	**100.0**		**31.0**

Data sources and industrial classification

To ensure that the measures of structural change presented in chapter 2 were comparable across countries, the measures were based on data that broadly correspond to the United Nations (UN) International Standard Industrial

Classification (ISIC, Revision 2). Information on value-added, employment and investment for the OECD countries, excluding New Zealand, was primarily sourced from the OECD *International Sectoral Data Base* (ISDB). UN (*National Accounts Statistics*: *Main Aggregates and Detailed Tables* and *Statistical Yearbook for Asia and the Pacific*) data were used for the Asian economies. The data for New Zealand were mainly taken from the Statistics New Zealand (*Economics Database*), supplemented with UN data, and are broadly consistent with the ISIC.

To obtain a consistent series for industries within the manufacturing sector, industry share data on value-added and employment were drawn from the Research School of Pacific Studies at the Australian National University, which sources its data from the UNIDO (*International Economic Data Bank* (IEDB)). However, this database did not include employment data for Denmark, Finland and Norway. Instead manufacturing employment data for these countries were directly sourced from the OECD's ISDB.

Where necessary, World Bank data on average annual exchange rates were used to convert local currency values to US dollars.

Every effort has been made to ensure that the data are comparable across time and countries. However, changes in reporting over time and variations across statistical sources means that not all data are strictly comparable.

The level of industry aggregation

SCIs can be influenced by the level of industry aggregation chosen (box A.1). A more disaggregated industry data set typically results in an increase in the degree of structural change observed because it captures more movement in output (employment) between industries. The SCIs reported in chapter 2 were calculated using value-added data for 18 industries. These results were compared with results using information at a more aggregated level for ten industries. While the larger industry data set resulted in a slight increase in the estimated SCI (up to 3 percentage points greater) compared with the smaller data set, the two measures moved closely together over time and did not significantly affect the cross-country rankings. Results are reported for the larger industry set only. de Laine, Lee and Woodridge (1997) found a similar result when comparing SCIs based on Australian employment data for a 54 and 11 industry disaggregation.

Table A.1 lists the 18 industries used to derive the SCIs reported in chapter 2. These industries correspond to the ISIC industry division level for agriculture, mining and market and non-market services industries, and to the nine subdivision level industries (ISIC 31–39) for the manufacturing sector. The non-market sector is represented by Producers of government services (which includes public

Table A.1 **International Standard Industrial Classification (revision 2)**

ISIC code	*Industry description*
1	*Agriculture, hunting, forestry and fishing*
2	*Mining and quarrying*
3	*Manufacturing:*
31	Food, beverages and tobacco
32	Textiles, wearing apparel and leather industries
33	Wood, and wood products, including furniture
34	Paper, and paper products, printing and publishing
35	Chemicals and chemical petroleum, coal, rubber and plastic products
36	Non-metallic mineral products except products of petroleum and coal
37	Basic metal industries
38	Fabricated metals products, machinery and equipment
39	Other manufacturing industries
	Market services:
4	Electricity, gas and water
5	Construction
6	Wholesale and retail trade, restaurants and hotels
7	Transport, storage and communication
8	Finance and insurance, real estate and business services
9	Community, social and personal services
-	Non-market services (Producers of government services and Other producers)

administration functions and national defence services, etc.) and Other producers (eg private nonprofit services).

While non-market services have been explicitly recognised for the calculation of the SCI, due to country differences in the way these services are reported, they have been combined with Community, social and personal services for the cross-country industry comparisons provided in tables A.2–4.

Time periods

SCIs can be compiled for different time periods to allow a comparison of the extent of change over time. Different time intervals can be used, such as year-to-year comparisons or point-to-point comparisons over longer periods of time (eg 1970 compared with 1990).

Year-to-year comparisons tend to exhibit considerable variability reflecting the influence of temporary and cyclical fluctuations in activity which can obscure the effects of longer term changes in output and employment shares between industries. To overcome this problem, it is best to make comparisons over a long time frame (say 10 years) using data at similar points in the business cycle. However, the timing of business cycles tend to vary between countries. Consequently, the SCIs

presented in chapter 2 are based on industry shares averaged over four years at the beginning and end of the relevant time periods. For example, structural change between 1970–90 is based on industry shares that are averaged over the 1970–73 period compared with shares averaged over the 1987–90 period. This provides a better guide to 'structural' as distinct from 'cyclical' change.

Price movements

SCIs are sensitive to price movements over time, which makes the distinction between using current or constant prices when examining the changing share of GDP accounted for by various sectors of the economy important. The analysis in chapter 2 is mainly based on data measured in actual or current prices. Resources move from one industry to another in response to changes in supply and demand, which in turn are influenced by changes in relative prices and non-price factors, such as the level of competition and quality. SCIs based on current price data have the advantage of capturing the impact of all changes on the total value of goods and services produced. For example, the data pick up the effect of falling computer prices due to technological advances and increased production resulting from productivity improvements. Current price data also have the strong intuitive appeal of reflecting the prices in which transactions take place.

SCIs based on constant price series, on the other hand, attempt to adjust output for changes in prices due to inflation to separate the effects of changes in volumes of output from those due to differences in price movements. Such data provide valuable information about the supply responses of producers to changes in relative prices and shifts in demand. However, it is difficult to obtain comparable price indexes for outputs and inputs for countries over time. Further, the measured SCIs are often sensitive to the base year of the constant price series. Clark, Geer and Underhill (1996) provide a useful example that demonstrates this point. In 1989-90, manufacturing accounted for 15 per cent of Australia's GDP, measured in 1989-90 prices, but when measured in 1968-69 prices accounted for approximately 21 per cent of GDP. This impact of re-basing the series becomes even more apparent with respect to the agricultural sector. The share of total Australian output accounted for by agriculture in 1989-90 doubles when measured in constant 1968-69 prices. For these reasons, constant price series have not been widely used in this study.

A.2 Structural change data

This section presents industry structure data for the selection of countries discussed in chapter 2, based on a snapshot for the years 1970, 1980 and 1990. Table A.2

presents industry shares of GDP measured in current prices. Table A.3 provides employment share data for the same industries, while table A.4 provides investment share data at the broad industry division level only.

Table A.2 **Industry shares of value-added by country, 1970, 1980, 1990[a]**

	1970	1980	1990	1970	1980	1990
	%	%	%	%	%	%
	Australia			**New Zealand[b]**		
Agriculture	5.7	5.2	3.3	11.8	12.1	9.0
Mining	3.0	6.2	4.7	0.5	0.8	1.2
Manufacturing	24.0	19.0	14.4	23.6	22.2	18.9
Food, bev. & tobacco	3.9	3.3	2.6	5.7	5.8	5.3
TCF	2.3	1.4	0.9	3.1	2.4	1.4
Wood & wood prod.	1.3	1.0	0.7	1.9	1.6	1.2
Paper, pap prod. & pr.	2.0	1.7	1.4	3.1	2.6	3.0
Chem & chem products	2.9	2.4	2.1	2.4	2.5	2.5
Non-metallic min. prod	1.2	1.0	0.7	1.2	0.8	0.7
Basic metal industries	2.4	2.2	1.7	0.4	0.8	0.7
Fabr. met., mach. & eq	7.9	5.9	4.1	5.5	5.5	3.9
Other manufacturing	0.2	0.2	0.1	0.3	0.2	0.2
Services	67.2	69.3	77.7	64.1	65.0	70.9
Electricity, gas & water	3.1	2.9	3.3	2.4	3.3	3.0
Construction	8.5	8.0	6.8	6.4	5.0	4.6
Wh. & ret tr, rest. & hot.	19.4	17.0	19.1	22.0	17.3	14.6
Transp & comms	7.4	6.9	7.6	7.9	8.2	8.5
Finance, insur., etc.	14.9	17.1	23.8	12.4	14.1	23.1
Comm, gov & other serv	13.9	17.6	17.2	13.1	17.2	17.0
	United States			**Canada**		
Agriculture	2.8	2.5	2.0	4.3	4.1	2.5
Mining	2.0	4.1	1.9	3.9	6.4	3.6
Manufacturing	24.8	21.5	18.3	22.5	19.5	17.8
Food, bev. & tobacco	2.9	2.3	2.3	3.5	2.7	2.6
TCF	2.0	1.3	0.9	1.9	1.4	1.0
Wood & wood prod.	0.7	0.6	0.5	1.3	1.3	1.1
Paper, pap prod. & pr.	2.4	2.1	2.2	3.0	2.9	2.6
Chem & chem products	3.7	3.4	3.2	2.6	2.6	2.8
Non-metallic min. prod	0.8	0.7	0.5	0.8	0.6	0.6
Basic metal industries	1.6	1.3	0.7	1.9	1.6	1.0
Fabr. met., mach. & eq	10.2	9.5	7.7	7.2	6.1	5.8
Other manufacturing	0.4	0.3	0.3	0.4	0.3	0.3
Services	69.0	70.7	76.4	69.2	70.0	76.1
Electricity, gas & water	2.3	2.6	2.8	2.4	2.9	3.1
Construction	4.8	4.7	4.3	7.1	7.2	7.0
Wh. & ret tr, rest. & hot.	16.7	16.4	16.3	14.8	13.6	14.2
Transp & comms	6.3	6.3	5.8	7.8	6.9	6.4
Finance, insur., etc.	18.1	20.3	25.2	14.4	17.0	20.7
Comm, gov & other serv	20.7	20.4	22.0	22.6	22.4	24.8

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Table A.2 **(Continued)**

	1970	1980	1990	1970	1980	1990
	%	%	%	%	%	%
	Japan			**France**		
Agriculture	5.9	3.6	2.4	7.3	4.5	3.5
Mining	0.8	0.5	0.2	0.9	0.9	0.5
Manufacturing	34.9	28.2	26.8	28.9	25.5	22.3
Food, bev. & tobacco	2.7	2.6	2.4	3.6	3.3	2.9
TCF	2.8	1.9	1.3	2.9	2.1	1.4
Wood & wood prod.	1.4	1.1	0.7	1.0	0.9	0.7
Paper, pap prod. & pr.	2.5	2.2	2.1	1.9	1.6	1.7
Chem & chem products	5.2	4.2	4.0	5.6	4.5	4.2
Non-metallic min. prod	1.7	1.4	1.1	1.4	1.2	0.9
Basic metal industries	3.3	2.8	1.8	2.1	1.5	1.1
Fabr. met., mach. & eq	14.6	11.6	13.0	10.0	9.9	9.0
Other manufacturing	0.6	0.4	0.4	0.5	0.4	0.4
Services	58.4	67.7	70.5	62.9	69.2	73.7
Electricity, gas & water	2.1	2.6	2.5	1.6	1.9	2.2
Construction	7.5	9.0	9.6	8.2	7.3	5.4
Wh. & ret tr, rest. & hot.	13.9	14.8	12.9	15.9	14.8	15.8
Transp & comms	6.7	5.9	6.3	6.4	6.2	6.0
Finance, insur., etc.	11.9	14.1	16.0	14.7	17.7	22.2
Comm, gov & other serv	16.4	21.2	23.2	16.1	21.3	22.0
	Germany			**Italy**		
Agriculture	3.4	2.2	1.6	8.0	5.8	3.3
Mining	1.3	0.9	0.5	..	..	..
Manufacturing	40.2	33.6	31.7	27.5	28.3	22.7
Food, bev. & tobacco	5.2	4.0	3.1	2.6	2.4	1.9
TCF	3.2	1.8	1.2	3.6	3.5	2.9
Wood & wood prod.	1.3	1.3	0.8	0.8	0.9	0.7
Paper, pap prod. & pr.	1.8	1.4	1.4	1.6	1.5	1.6
Chem & chem products	6.6	5.9	6.3	5.1	4.4	3.0
Non-metallic min. prod	2.0	1.5	1.1	1.9	1.9	1.4
Basic metal industries	3.9	2.7	1.6	2.7	2.8	1.6
Fabr. met., mach. & eq	15.9	14.8	15.9	8.9	10.4	9.4
Other manufacturing	0.3	0.2	0.2	0.5	0.3	0.3
Services	55.2	63.3	66.3	64.5	65.9	74.0
Electricity, gas & water	2.2	2.6	2.5	4.8	3.9	5.2
Construction	8.0	7.1	5.4	9.7	7.4	5.9
Wh. & ret tr, rest. & hot.	11.4	10.7	10.4	16.0	18.4	18.6
Transp & comms	5.9	6.0	5.7	5.6[c]	5.2	5.7
Finance, insur., etc.	8.6	11.0	12.3	3.4	5.0	4.9
Comm, gov & other serv	19.0	25.9	29.8	24.9	25.8	33.6

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Table A.2 **(Continued)**

	1970	1980	1990	1970	1980	1990
	%	%	%	%	%	%
	United Kingdom			**Belgium[d]**		
Agriculture	2.8	2.1	1.8	3.5	2.2	2.0
Mining	1.8	6.2	2.2	..	..	..
Manufacturing	32.4	25.9	22.1	28.5	23.0	22.2
Food, bev. & tobacco	4.1	3.5	3.0	4.7	3.6	3.2
TCF	2.9	1.7	1.2	3.5	1.9	1.7
Wood & wood prod.	0.9	0.8	0.7	0.0	0.0	0.0
Paper, pap prod. & pr.	2.6	2.3	2.4	1.6	1.4	1.5
Chem & chem products	4.6	4.3	3.9	3.0	3.3	3.9
Non-metallic min. prod	1.3	1.3	1.1	2.2	1.5	1.3
Basic metal industries	2.7	1.3	0.9	3.6	2.1	2.2
Fabr. met., mach. & eq	13.1	10.5	8.7	8.3	7.6	7.2
Other manufacturing	0.4	0.3	0.2	1.6	1.5	1.3
Services	63.0	65.8	73.9	68.0	74.7	75.9
Electricity, gas & water	2.9	3.0	2.1	5.2	5.0	4.2
Construction	6.4	5.9	6.9	7.6	7.9	5.7
Wh. & ret tr, rest. & hot.	13.2	12.7	13.5	19.3	16.7	18.9
Transp & comms	8.1	7.1	8.0	7.5	8.2	8.5
Finance, insur., etc.	14.0	16.4	23.3	2.9	4.6	5.0
Comm, gov & other serv	18.3	20.8	20.2	25.6	32.3	33.6
	Denmark			**Finland**		
Agriculture	6.3	5.5	4.3	12.3	9.6	6.2
Mining	0.1	0.1	1.0	0.9	0.5	0.4
Manufacturing	21.1	19.7	18.3	26.3	27.6	22.7
Food, bev. & tobacco	4.4	4.4	3.8	3.5	2.9	2.7
TCF	1.9	1.2	0.9	2.6	2.3	0.9
Wood & wood prod.	1.3	0.9	1.0	1.7	2.4	1.4
Paper, pap prod. & pr.	2.4	2.1	2.0	5.9	6.0	4.7
Chem & chem products	2.1	2.4	2.5	2.6	3.3	2.5
Non-metallic min. prod	1.6	1.1	0.8	1.1	1.1	1.1
Basic metal industries	0.4	0.3	0.2	1.2	1.3	1.0
Fabr. met., mach. & eq	6.8	6.9	6.7	6.5	7.2	7.6
Other manufacturing	0.3	0.4	0.5	1.1	1.0	0.8
Services	72.4	74.7	76.4	60.4	62.3	70.7
Electricity, gas & water	1.7	1.4	1.8	2.7	2.8	2.0
Construction	10.7	7.5	5.7	9.7	7.8	9.3
Wh. & ret tr, rest. & hot.	17.3	13.9	13.5	12.0	12.7	12.5
Transp & comms	8.9	7.9	8.8	7.8	7.7	7.8
Finance, insur., etc.	12.4	16.1	19.2	11.8	13.1	16.8
Comm, gov & other serv	21.4	27.9	27.5	16.3	18.1	22.2

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Table A.2 **(Continued)**

	1970	1980	1990	1970	1980	1990
	%	%	%	%	%	%
	Norway			**Netherlands**		
Agriculture	6.2	4.2	3.3	5.9	3.7	4.3
Mining	0.8	16.0	14.3	1.6	5.9	3.2
Manufacturing	23.9	17.3	14.6	26.9	19.0	20.1
Food, bev. & tobacco	3.6	1.9	2.9	4.5	3.6	4.2
TCF	1.7	0.7	0.3	2.0	0.8	0.6
Wood & wood prod.	2.0	1.5	0.9	1.0	0.7	0.4
Paper, pap prod. & pr.	3.1	2.1	2.3	2.3	2.1	2.2
Chem & chem products	2.5	2.0	1.9	4.6	2.9	4.6
Non-metallic min. prod	0.9	0.7	0.5	1.3	0.8	0.7
Basic metal industries	2.7	2.2	1.2	1.4	0.8	0.9
Fabr. met., mach. & eq	7.0	6.1	4.5	9.7	7.0	6.5
Other manufacturing	0.2	0.1	0.1	0.2	0.2	0.0
Services	69.1	62.6	67.9	65.0	71.5	72.5
Electricity, gas & water	3.0	3.1	4.3	2.3	2.2	1.8
Construction	7.7	6.4	4.7	7.8	7.0	5.5
Wh. & ret tr, rest. & hot.	13.8	12.6	11.8	14.9	13.8	15.6
Transp & comms	16.3	10.2	10.4	7.4	6.5	6.6
Finance, insur., etc.	10.1	10.7	14.7	11.7	16.6	21.1
Comm, gov & other serv	18.3	19.5	21.9	21.0	25.4	21.8
	Sweden[d]			**Hong Kong**		
Agriculture	5.0	3.7	2.8	2.2	0.8	0.2
Mining	0.7	0.4	0.3	0.2	0.2	0.0
Manufacturing	26.4	23.0	21.4	31.1	22.5	16.7
Food, bev. & tobacco	2.7	2.3	2.2	1.2	1.0	1.4
TCF	1.5	0.7	0.4	12.9	9.4	6.0
Wood & wood prod.	2.1	1.9	1.5	0.7	0.3	0.1
Paper, pap prod. & pr.	3.8	3.3	3.2	1.6	1.2	1.6
Chem & chem products	2.4	2.6	3.0	5.0	2.2	1.4
Non-metallic min. prod	1.2	0.8	0.6	0.3	0.2	0.2
Basic metal industries	2.4	1.5	1.1	0.6	0.2	0.1
Fabr. met., mach. & eq	10.3	9.8	9.3	7.3	7.2	5.3
Other manufacturing	0.1	0.1	0.1	1.5	0.8	0.6
Services	67.4	73.0	75.5	65.9	67.4	83.1
Electricity, gas & water	2.3	2.8	2.9	1.9	1.3	2.1
Construction	8.2	7.3	7.5	3.3	6.3	5.1
Wh. & ret tr, rest. & hot.	11.4	11.3	11.1	21.8	19.3	23.8
Transp & comms	7.1	6.8	6.5	7.4	7.1	9.0
Finance, insur., etc.	15.4	15.5	19.8	14.6	21.6	29.2
Comm, gov & other serv	23.2	29.2	27.6	16.9	11.8	13.8

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Table A.2 **(Continued)**

	1970	1980	1990	1970	1980	1990
	%	%	%	%	%	%
	Indonesia			**Korea (Republic of)**		
Agriculture	48.6	24.0	21.5	26.7	14.9	8.7
Mining	5.3	23.0	13.4	1.3	1.6	0.6
Manufacturing	9.0	13.0	19.9	21.7	28.6	29.2
Food, bev. & tobacco	5.9	4.1	5.5	5.6	4.7	3.1
TCF	1.2	1.8	2.9	3.7	5.6	3.5
Wood & wood prod.	0.1	0.9	2.2	0.8	0.5	0.5
Paper, pap prod. & pr.	0.2	0.4	0.9	1.1	1.3	1.4
Chem & chem products	0.7	2.2	2.8	4.8	5.9	5.3
Non-metallic min. prod	0.4	0.9	0.8	1.3	1.6	1.4
Basic metal industries	0.0	0.4	1.8	0.9	2.2	2.2
Fabr. met., mach. & eq	0.5	2.2	2.9	2.9	6.2	11.3
Other manufacturing	0.1	0.1	0.1	0.6	0.5	0.5
Services	37.0	40.1	45.2	50.3	54.9	61.5
Electricity, gas & water	0.5	0.5	0.6	1.6	2.1	2.2
Construction	3.1	5.3	5.5	5.3	8.2	11.6
Wh. & ret tr, rest. & hot.	16.6	15.0	16.9	16.4	13.5	12.9
Transp & comms	3.0	4.5	5.6	6.9	7.7	6.7
Finance, insur., etc.	3.0	4.4	6.7	8.8	11.3	15.0
Comm, gov & other serv	10.9	10.4	9.8	11.3	12.2	13.2
	Philippines			**Singapore**		
Agriculture	28.6	25.1	21.9	2.3	1.2	0.2
Mining	2.8	2.2	1.5	0.3	0.3	0.1
Manufacturing	23.6	25.7	24.8	20.1	28.0	28.1
Food, bev. & tobacco	9.1	7.8	9.7	2.4	1.4	1.2
TCF	2.0	3.3	2.7	1.0	1.5	0.9
Wood & wood prod.	1.1	1.6	0.7	1.3	0.9	0.3
Paper, pap prod. & pr.	1.3	1.1	0.9	1.1	1.2	1.7
Chem & chem products	5.7	6.4	5.1	5.8	7.1	5.8
Non-metallic min. prod	0.9	0.7	1.0	0.6	0.7	0.4
Basic metal industries	0.9	0.7	1.0	0.4	0.5	0.3
Fabr. met., mach. & eq	2.5	3.8	3.6	6.9	14.4	17.1
Other manufacturing	0.1	0.3	0.3	0.5	0.5	0.3
Services	45.0	46.9	51.7	77.3	70.5	71.5
Electricity, gas & water	0.8	1.6	2.1	2.6	2.1	1.8
Construction	3.6	9.3	6.0	6.7	6.1	5.1
Wh. & ret tr, rest. & hot.	14.9	13.2	15.8	26.4	20.8	17.7
Transp & comms	4.6	4.6	4.9	10.6	13.5	12.4
Finance, insur., etc.	10.1	10.0	10.6	17.5	18.9	24.8
Comm, gov & other serv	11.0	8.2	12.2	13.4	9.1	9.8

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Table A.2 **(Continued)**

	1970	1980	1990
	%	%	%
	Thailand		
Agriculture	28.3	23.2	12.7
Mining	2.0	1.8	1.6
Manufacturing	16.0	21.5	27.2
Food, bev. & tobacco	6.9	7.2	7.5
TCF	2.0	4.1	6.5
Wood & wood prod.	0.8	0.9	0.9
Paper, pap prod. & pr.	0.5	0.5	0.6
Chem & chem products	2.2	3.3	3.9
Non-metallic min. prod	0.6	0.7	1.1
Basic metal industries	0.4	1.2	0.4
Fabr. met., mach. & eq	1.9	2.9	4.7
Other manufacturing	0.6	0.8	1.6
Services	53.6	53.5	58.5
Electricity, gas & water	1.2	1.0	2.2
Construction	6.1	4.4	6.2
Wh. & ret tr, rest. & hot.	22.8	22.8	23.9
Transp & comms	6.3	5.3	7.1
Finance, insur., etc.	6.3	6.9	9.0
Comm, gov & other serv	10.9	13.1	10.0

a Industry division shares are based on value-added data measured in current prices and converted to US dollars using average annual exchange rates. These shares may not add to 100 due to statistical discrepancies. **b** Industry division shares for 1970 are based on data for 1973, but manufacturing industry splits are based on 1970 shares. **c** Calculated as a residual of the services sector. **d** Industry division shares for 1970 are based on data for 1971, but manufacturing industry splits are based on 1970 shares. **..** Negligible.

Sources: PC estimates based on data from: SNZ Economics Database; World Bank Tables; OECD (1996c); UN (various years); UNIDO (1995, 1997).

Table A.3 **Industry shares of employment by country, 1970, 1980, 1990[a,b]**

	1970	1980	1990	1970	1980	1990
	%	%	%	%	%	%
	Australia			**New Zealand**		
Agriculture	8.0	6.6	5.6	12.9	10.9	10.6
Mining	1.5	1.4	1.2	0.5	0.4	0.3
Manufacturing	24.1	19.4	14.7	28.0	25.2	17.1
Food, bev. & tobacco	3.6	3.1	2.5	6.1	6.5	4.7
TCF	3.5	2.1	1.5	5.7	3.7	2.1
Wood & wood prod.	1.5	1.3	1.1	2.4	1.9	1.4
Paper, pap prod. & pr.	1.9	1.7	1.5	3.0	2.5	2.0
Chem & chem products	2.1	1.8	1.4	2.0	2.1	1.5
Non-metallic min. prod	1.0	0.8	0.6	1.1	0.9	0.4
Basic metal industries	1.7	1.6	1.0	0.4	0.6	0.5
Fabr. met., mach. & eq	8.6	6.8	4.9	6.9	6.7	4.2
Other manufacturing	0.3	0.2	0.2	0.5	0.3	0.2
Services	66.5	72.7	78.4	61.6	63.5	71.6
Electricity, gas & water	1.9	2.0	1.3	1.5	1.1	0.9
Construction	8.7	7.9	7.4	8.0	7.1	6.2
Wh. & ret tr, rest. & hot.	23.6	23.5	24.9	17.3	17.1	21.1
Transp & comms	7.7	7.4	6.9	9.3	8.5	6.3
Finance, insur., etc.	7.8	9.3	12.4	6.2[c]	7.0	9.8
Comm, gov & other serv	17.0	22.6	25.6	19.4[c]	22.7	27.3
	United States			**Canada[d]**		
Agriculture	4.0	3.4	2.6	7.4	5.4	4.2
Mining	0.8	1.1	0.6	1.6	1.8	1.4
Manufacturing	24.5	21.0	16.6	21.7	19.6	16.0
Food, bev. & tobacco	2.3	1.7	1.4	3.0	2.6	1.9
TCF	3.5	2.6	1.7	3.0	2.3	1.6
Wood & wood prod.	1.1	1.0	0.9	1.8	1.8	1.4
Paper, pap prod. & pr.	2.3	2.1	2.0	2.7	2.5	2.2
Chem & chem products	2.3	2.0	1.8	1.9	1.8	1.8
Non-metallic min. prod	0.8	0.7	0.5	0.7	0.6	0.5
Basic metal industries	1.6	1.1	0.6	1.5	1.4	0.8
Fabr. met., mach. & eq	10.1	9.3	7.3	6.7	6.3	5.4
Other manufacturing	0.5	0.4	0.3	0.4	0.4	0.4
Services	69.0	72.9	78.6	69.3	73.2	78.4
Electricity, gas & water	0.9	0.8	0.8	1.0	1.1	1.0
Construction	5.3	5.6	5.6	6.0	5.8	6.3
Wh. & ret tr, rest. & hot.	20.3	21.6	22.8	20.7	22.3	24.1
Transp & comms	4.9	4.5	4.2	7.6	7.2	6.5
Finance, insur., etc.	8.4	11.1	14.6	7.8	9.4	11.6
Comm, gov & other serv	29.2	29.2	30.5	26.2	27.3	29.0

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Table A.3 **(Continued)**

	1970	1980	1990	1970	1980	1990
	%	%	%	%	%	%
	Japan			**France[d]**		
Agriculture	19.7	12.9	8.8	12.4	8.4	5.6
Mining	0.5	0.3	0.2	1.0	0.8	0.5
Manufacturing	26.7	24.0	24.0	27.9	24.6	20.3
Food, bev. & tobacco	2.5	2.5	2.6	2.6	2.4	2.3
TCF	3.8	3.0	2.5	4.5	3.1	2.0
Wood & wood prod.	1.8	1.4	1.0	1.2	1.1	0.8
Paper, pap prod. & pr.	1.9	1.8	1.8	1.8	1.6	1.6
Chem & chem products	2.3	2.1	2.2	2.8	2.8	2.5
Non-metallic min. prod	1.3	1.2	1.0	1.3	1.1	0.8
Basic metal industries	1.7	1.3	1.0	1.9	1.6	1.1
Fabr. met., mach. & eq	10.9	10.2	11.4	11.2	10.5	8.7
Other manufacturing	0.6	0.5	0.5	0.5	0.5	0.5
Services	53.1	62.9	67.1	58.7	66.2	73.6
Electricity, gas & water	0.5	0.6	0.6	0.6	0.7	0.7
Construction	8.1	10.1	9.6	9.5	8.7	7.4
Wh. & ret tr, rest. & hot.	16.0	17.8	17.2	15.9	16.7	17.5
Transp & comms	5.5	5.7	5.5	5.0	5.4	5.7
Finance, insur., etc.	3.1	4.0	4.8	5.6	7.8	10.7
Comm, gov & other serv	19.9[e]	24.7	29.4	22.1	26.9	31.5
	Germany			**Italy**		
Agriculture	8.5	5.2	3.5	19.0	13.6	9.6
Mining	1.2	0.9	0.6	..	..	..
Manufacturing	38.1	33.7	31.4	27.1	27.0	22.0
Food, bev. & tobacco	2.4	2.3	2.1	1.9	1.8	1.6
TCF	4.7	3.0	1.9	6.0	4.6	4.0
Wood & wood prod.	1.3	1.3	1.1	1.2	1.0	0.8
Paper, pap prod. & pr.	2.0	1.6	1.5	1.3	1.2	1.2
Chem & chem products	4.4	4.3	4.4	3.2	3.4	2.4
Non-metallic min. prod	1.7	1.4	1.1	2.0	1.7	1.2
Basic metal industries	3.7	3.0	1.6	2.1	2.3	1.4
Fabr. met., mach. & eq	17.6	16.6	17.5	9.1	10.7	9.3
Other manufacturing	0.3	0.3	0.2	0.4	0.3	0.2
Services	52.2	60.2	64.5	53.9	59.4	68.4
Electricity, gas & water	0.9	1.0	1.0	0.9	0.9	0.8
Construction	8.7	7.9	6.7	10.1	8.0	7.0
Wh. & ret tr, rest. & hot.	15.1	15.7	16.3	17.1	18.9	21.3
Transp & comms	5.3	5.6	5.6	5.2	5.7	6.4
Finance, insur., etc.	2.2	2.8	3.1	1.0	1.6	1.8
Comm, gov & other serv	19.9	27.2	31.8	19.6	24.4	31.1

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Table A.3 **(Continued)**

	1970	1980	1990	1970	1980	1990
	%	%	%	%	%	%
	United Kingdom			**Belgium[f]**		
Agriculture	3.2	2.6	2.1	4.4	3.0	2.5
Mining	1.7	1.4	0.7	..	..	..
Manufacturing	34.2	28.0	28.3	29.7	23.4	19.9
Food, bev. & tobacco	3.4	3.0	3.5	3.1	2.7	2.5
TCF	4.8	3.1	2.9	5.8	3.3	2.6
Wood & wood prod.	1.0	1.0	1.1	1.4	1.1	0.9
Paper, pap prod. & pr.	2.6	2.2	2.7	1.8	1.4	1.4
Chem & chem products	3.1	2.9	3.3	2.7	2.7	2.8
Non-metallic min. prod	1.4	1.1	1.2	1.7	1.4	1.0
Basic metal industries	2.6	1.8	1.2	3.3	2.2	1.4
Fabr. met., mach. & eq	14.9	12.4	11.9	9.6	8.3	7.0
Other manufacturing	0.5	0.4	0.4	0.5	0.4	0.3
Services	59.5	68.0	76.8	63.1	70.3	73.7
Electricity, gas & water	1.6	1.4	1.0	2.0	1.6	0.9
Construction	6.7	6.4	6.8	8.6	8.1	6.6
Wh. & ret tr, rest. & hot.	16.2	19.0	19.8	18.9	18.9	19.3
Transp & comms	6.6	6.2	5.6	6.4	7.1	6.4
Finance, insur., etc.	4.9	7.3	12.0	0.0	0.0	0.0
Comm, gov & other serv	23.5	27.7	31.5	27.3	34.6	40.5
	Denmark			**Finland**		
Agriculture	11.4	7.9	5.5	20.7	13.2	8.8
Mining	0.1	0.1	0.1	0.3	0.4	0.2
Manufacturing	24.9	20.1	20.2	23.0	24.9	20.2
Food, bev. & tobacco	4.7	3.7	1.3	2.9	2.8	2.4
TCF	3.1	1.7	1.3	3.7	3.2	1.5
Wood & wood prod.	1.9	1.3	1.5	2.3	2.3	1.5
Paper, pap prod. & pr.	2.5	2.0	2.0	3.8	4.2	3.7
Chem & chem products	1.8	1.7	1.9	1.5	1.8	1.7
Non-metallic min. prod	1.4	1.1	0.8	1.0	1.0	0.9
Basic metal industries	0.4	0.3	0.2	0.7	0.9	0.7
Fabr. met., mach. & eq	8.6	7.8	8.4	6.1	7.5	6.8
Other manufacturing	0.5	0.4	0.5	1.1	1.2	0.9
Services	63.6	72.0	74.3	55.2	61.5	70.8
Electricity, gas & water	0.6	0.6	0.7	0.9	1.2	1.2
Construction	9.7	7.7	6.5	9.3	7.8	8.8
Wh. & ret tr, rest. & hot.	16.4	13.9	12.9	16.1	15.7	16.7
Transp & comms	6.9	6.9	7.1	6.6	7.1	7.5
Finance, insur., etc.	5.5	7.9	10.0	3.7	5.7	8.7
Comm, gov & other serv	24.5	34.9	37.0	18.6	23.9	27.9

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Table A.3 **(Continued)**

	1970	1980	1990	1970	1980	1990
	%	%	%	%	%	%
	Norway			**Netherlands**		
Agriculture	12.9	8.4	6.3	6.7	5.6	5.0
Mining	0.6	0.8	1.0	0.5	0.2	0.2
Manufacturing	23.8	19.8	14.7	26.3	20.7	18.5
Food, bev. & tobacco	3.6	3.1	2.6	4.0	3.4	2.9
TCF	2.4	1.2	0.5	3.6	1.3	0.9
Wood & wood prod.	2.2	1.9	1.3	1.3	0.9	0.7
Paper, pap prod. & pr.	3.5	2.8	2.4	2.6	2.4	2.3
Chem & chem products	3.0	2.5	1.9	3.0	2.5	2.6
Non-metallic min. prod	..	..	..	1.2	0.9	0.7
Basic metal industries	1.8	1.4	1.0	1.0	0.8	0.6
Fabr. met., mach. & eq	7.4	6.8	5.0	9.5	8.2	7.5
Other manufacturing	..	..	..	0.2	0.2	0.3
Services	62.8	71.1	77.9	66.9	73.6	76.3
Electricity, gas & water	0.9	0.9	1.0	0.9	0.9	0.9
Construction	8.2	7.9	7.3	11.1	9.8	7.5
Wh. & ret tr, rest. & hot.	15.5	16.6	16.7	19.2	19.3	20.0
Transp & comms	10.2	9.1	8.8	6.3	6.5	6.7
Finance, insur., etc.	3.7	5.0	7.4	6.5	8.6	11.7
Comm, gov & other serv	24.2	31.6	36.6	22.9	28.4	29.7
	Sweden[f]			**Hong Kong**		
Agriculture	7.9	5.5	3.7	na	1.4	0.9
Mining	0.5	0.4	0.2	na	0.0	0.0
Manufacturing	27.6	24.5	20.4	na	42.1	27.7
Food, bev. & tobacco	2.3	2.1	1.9	na	1.0	1.0
TCF	2.1	1.1	0.6	na	18.7	12.5
Wood & wood prod.	2.4	2.0	1.6	na	0.7	0.3
Paper, pap prod. & pr.	3.2	3.0	2.7	na	2.0	2.1
Chem & chem products	2.0	2.0	1.8	na	4.1	2.2
Non-metallic min. prod	1.1	0.8	0.6	na	0.2	0.2
Basic metal industries	2.1	1.8	1.1	na	0.2	0.1
Fabr. met., mach. & eq	12.3	11.5	10.0	na	13.9	8.1
Other manufacturing	0.2	0.2	0.1	na	1.4	1.2
Services	66.2	71.7	74.6	na	55.9	73.6
Electricity, gas & water	0.7	0.8	0.7	na	0.5	0.7
Construction	8.8	7.1	6.6	na	7.5	8.3
Wh. & ret tr, rest. & hot.	14.9	13.9	14.0	na	20.0	28.1
Transp & comms	6.4	6.6	6.5	na	7.3	9.9
Finance, insur., etc.	5.3	5.7	8.3	na	4.6	7.7
Comm, gov & other serv	29.9	37.6	38.4	na	16.5	18.9

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Table A.3 **(Continued)**

	1970	1980	1990	1970	1980	1990
	%	%	%	%	%	%
	Indonesia			**Korea (Republic of)**		
Agriculture	na	56.3	55.9	50.4	34.0	17.9
Mining	na	0.8	0.7	1.1	0.9	0.4
Manufacturing	na	9.1	10.1	13.2	21.6	27.2
Food, bev. & tobacco	na	3.0	2.7	1.8	1.9	1.9
TCF	na	2.4	2.6	4.1	6.7	6.0
Wood & wood prod.	na	0.6	1.4	0.7	0.7	0.8
Paper, pap prod. & pr.	na	0.3	0.3	0.8	1.0	1.2
Chem & chem products	na	1.0	1.4	1.6	2.8	3.9
Non-metallic min. prod	na	0.4	0.5	0.8	1.0	1.1
Basic metal industries	na	0.1	0.1	0.5	1.0	1.1
Fabr. met., mach. & eq	na	1.1	1.1	2.2	5.7	10.3
Other manufacturing	na	0.1	0.1	0.8	0.8	0.8
Services	na	33.8	33.1	35.2	43.2	54.6
Electricity, gas & water	na	0.1	0.2	na	0.3	0.4
Construction	na	3.2	2.7	2.9	6.2	7.4
Wh. & ret tr, rest. & hot.	na	13.0	14.6	na	19.2	21.8
Transp & comms	na	2.9	3.0	na	4.5	5.1
Finance, insur., etc.	na	0.6	0.6	na	2.4	5.2
Comm, gov & other serv	na	13.9	12.0	na	10.9	14.6
	Philippines			**Singapore**		
Agriculture	53.7	51.8	45.2	na	1.3	0.4
Mining	0.5	0.8	0.6	na	0.1	0.0
Manufacturing	11.9	10.8	9.7	na	29.2	29.1
Food, bev. & tobacco	3.6	2.6	2.3	na	1.4	1.1
TCF	2.6	2.9	2.9	na	4.0	2.7
Wood & wood prod.	1.4	1.2	1.1	na	1.7	0.7
Paper, pap prod. & pr.	0.7	0.4	0.4	na	1.6	1.7
Chem & chem products	1.2	1.1	1.0	na	2.4	2.5
Non-metallic min. prod	0.6	0.4	0.3	na	0.5	0.4
Basic metal industries	0.3	0.3	0.2	na	0.2	0.2
Fabr. met., mach. & eq	1.5	1.7	1.3	na	16.6	19.2
Other manufacturing	0.1	0.2	0.3	na	0.8	0.5
Services	33.9	36.6	44.4	na	68.9	70.5
Electricity, gas & water	0.3	0.3	0.4	na	0.9	0.4
Construction	3.9	3.5	4.3	na	5.4	7.9
Wh. & ret tr, rest. & hot.	7.4	10.5	14.0	na	22.9	22.0
Transp & comms	4.4	4.2	5.0	na	11.5	9.5
Finance, insur., etc.	na	1.8	2.0	na	7.4	10.9
Comm, gov & other serv	18.0	16.3	18.7	na	20.8	19.7

(Continued next page)

Table A.3 **(Continued)**

	1970	1980	1990
	%	%	%
	Thailand		
Agriculture	na	70.8	64.0
Mining	na	0.2	0.2
Manufacturing	na	7.9	10.2
Food, bev. & tobacco	na	2.8	2.8
TCF	na	2.4	3.8
Wood & wood prod.	na	0.3	0.4
Paper, pap prod. & pr.	na	0.2	0.3
Chem & chem products	na	0.6	0.6
Non-metallic min. prod	na	0.2	0.3
Basic metal industries	na	0.2	0.1
Fabr. met., mach. & eq	na	1.0	1.3
Other manufacturing	na	0.3	0.5
Services	na	21.1	25.7
Electricity, gas & water	na	0.3	0.4
Construction	na	1.9	3.3
Wh. & ret tr, rest. & hot.	na	0.0	0.0
Transp & comms	na	8.4	9.9
Finance, insur., etc.	na	8.5	9.6
Comm, gov & other serv	na	2.0	2.4

a Share of industry employment in total employment. **b** Shares may not add to 100 due to statistical discrepancies. **c** Based on 1973 industry shares. **d** Shares for 1970 are based on 1971 data for all industries, except manufacturing. **e** Producers of government services component was estimated as a residual. **f** Shares for 1970 are based on 1970 data. **na** Not available. **..** Negligible.

Sources: PC estimates based on data from: SNZ Economics Database; World Bank Tables; OECD (1996c); UN (various years); UNIDO (1995, 1997).

Table A.4 **Industry shares of investment by country, 1970, 1980, 1990[a,b]**

	1970	1980	1990	1970	1980	1990
	%	%	%	%	%	%
	Australia			**New Zealand[c]**		
Agriculture	4.9	6.0	2.6	na	13.0	3.6
Mining	8.6	6.0	6.8	na	2.0	0.8
Manufacturing	13.4	10.5	8.8	na	13.4	12.2
Services	73.1	77.5	81.8	na	71.8	80.7
Electricity, gas & water	7.6	7.9	5.2	na	9.3	4.4
Construction	1.7	2.3	2.3	na	2.8	1.7
Wh. & ret tr, rest. & hot.	6.3	6.8	6.3	na	11.2	11.8
Transp & comms	8.9	9.0	9.8	na	7.9	10.0
Finance, insur., etc.	29.3	35.8	40.1	na	24.9	42.6
Comm, gov & other serv	19.3	15.7	18.0	na	15.8	10.1
	United States			**Canada**		
Agriculture	4.1	3.7	2.0	4.8	6.6	2.2
Mining	2.8	7.9	2.7	7.0	11.6	5.4
Manufacturing	13.3	14.6	13.8	16.8	13.4	13.8
Services	74.3	69.3	76.0	71.3	68.3	78.6
Electricity, gas & water	5.8	5.4	5.6	9.6	9.8	8.5
Construction	1.7	1.0	0.7	1.4	1.5	1.4
Wh. & ret tr, rest. & hot.	6.4	6.9	9.1	3.3	3.3	3.5
Transp & comms	9.1	8.3	5.6	9.9	8.8	8.1
Finance, insur., etc.	30.8	33.2	37.1	27.9	31.5	41.2
Comm, gov & other serv	20.6	14.5	17.8	19.1	13.4	15.8
	Japan			**France[d]**		
Agriculture	6.2	6.9	4.0	4.0	3.6	3.0
Mining	0.5	0.3	0.1	0.1	0.2	0.1
Manufacturing	26.5	18.0	23.8	19.1	15.4	17.1
Services	66.8	74.9	72.1	76.5	80.6	79.6
Electricity, gas & water	4.0	5.4	3.9	3.6	6.0	3.1
Construction	2.1	2.8	3.0	3.6	3.3	2.3
Wh. & ret tr, rest. & hot.	4.8	6.0	6.2	6.9	6.7	8.1
Transp & comms	7.9	6.2	5.7	7.6	9.4	8.6
Finance, insur., etc.	29.7	26.9	25.0	40.3	41.2	39.4
Comm, gov & other serv	18.3	27.5	28.3	14.4	14.0	18.0
	Germany			**Italy[d]**		
Agriculture	3.3	2.8	2.4	6.4	7.0	5.6
Mining	0.6	0.7	0.4	..	..	..
Manufacturing	23.6	17.7	20.4	21.0	22.3	18.7
Services	70.7	77.3	75.5	72.6	70.7	75.7
Electricity, gas & water	4.1	4.9	3.9	4.2	4.5	4.6
Construction	2.5	1.8	1.5	2.4	3.5	2.5
Wh. & ret tr, rest. & hot.	5.7	5.0	6.3	7.1	7.5	8.6
Transp & comms	9.1	7.8	8.1	7.5	8.7	12.8
Finance, insur., etc.	26.4	29.3	26.2	35.4	29.6	27.6
Comm, gov & other serv	22.9	28.5	29.4	16.0	16.8	19.6

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Table A.4 **(Continued)**

	1970	1980	1990	1970	1980	1990
	%	%	%	%	%	%
	United Kingdom			**Belgium[d]**		
Agriculture	2.6	2.4	1.3	1.7	2.1	1.9
Mining	2.0	9.2	4.4	..	..	..
Manufacturing	18.8	16.3	13.2	24.2	14.6	27.5
Services	76.7	72.1	81.2	74.1	83.3	70.6
Electricity, gas & water	5.8	4.0	4.4	8.8	6.0	4.5
Construction	1.4	1.1	0.9	2.1	1.7	2.3
Wh. & ret tr, rest. & hot.	5.7	7.7	8.5	8.5	7.6	12.9
Transp & comms	10.1	9.0	8.8	9.2	12.0	8.1
Finance, insur., etc.	23.8	29.9	39.6	19.9	30.5	24.0
Comm, gov & other serv	29.9	20.4	19.0	25.6	25.4	18.8
	Denmark			**Finland**		
Agriculture	5.0	7.5	6.1	7.7	9.4	5.1
Mining	0.1	1.2	1.4	0.4	0.4	0.2
Manufacturing	12.4	13.2	14.5	20.9	17.9	15.6
Services	82.5	78.1	78.1	69.9	70.9	77.8
Electricity, gas & water	3.8	4.2	6.9	4.7	4.6	3.9
Construction	3.4	2.7	2.8	2.5	2.0	2.1
Wh. & ret tr, rest. & hot.	4.8	4.4	6.3	8.1	6.3	8.9
Transp & comms	10.6	11.7	17.8	10.2	9.8	7.3
Finance, insur., etc.	34.8	31.1	22.4	30.4	33.0	40.9
Comm, gov & other serv	25.1	24.0	21.8	13.9	15.2	14.8
	Norway			**Netherlands**		
Agriculture	6.6	8.2	4.2	3.3	4.8	5.0
Mining	2.4	9.7	12.6	1.2	1.4	1.2
Manufacturing	15.3	12.8	11.5	19.3	14.7	15.7
Services	75.7	69.4	71.8	77.2	81.6	78.1
Electricity, gas & water	8.1	9.9	5.3	5.8	4.2	2.6
Construction	2.0	2.2	4.7	2.0	1.6	1.8
Wh. & ret tr, rest. & hot.	4.6	4.6	4.0	8.6	7.7	9.0
Transp & comms	20.5	10.9	15.0	8.6	9.1	11.0
Finance, insur., etc.	21.8	23.9	23.6	23.9	31.4	26.2
Comm, gov & other serv	18.6	17.8	19.2	28.3	27.4	27.5
	Sweden[d]					
Agriculture	3.6	4.1	2.8			
Mining	0.8	0.8	0.5			
Manufacturing	17.3	16.5	16.1			
Services	79.5	77.7	79.8			
Electricity, gas & water	9.2	8.0	4.6			
Construction	1.7	1.7	2.7			
Wh. & ret tr, rest. & hot.	4.5	4.8	8.1			
Transp & comms	9.2	9.7	10.9			
Finance, insur., etc.	33.6	35.3	39.9			
Comm, gov & other serv	21.3	18.2	13.6			

a Share of industry gross fixed capital formation in total gross fixed capital formation. **b** Shares may not add to 100 due to statistical discrepancies. **c** 1990 shares are based on 1988 data. **d** 1970 shares are based on 1971 data. **na** Not available. **..** Negligible.

Sources: PC estimates based on: World Bank Tables; OECD (1996c); UN (various years); UNIDO (1995, 1997).

B Australia's regions — additional data and information

This appendix provides additional material that supports the analysis presented in chapter 3. It includes the following:

- comparisons of population, GDP and unemployment data at the state level or equivalent for Australia, Canada, the United States, France, Italy and the United Kingdom;
- a description of the selection process for the 113 Australian regions examined in chapter 3;
- data for the 113 regions, including rates of structural change, employment growth, unemployment rates and average household incomes for 1981 and 1996;
- an overview of the extent of variation in regional performance (according to employment growth, unemployment rates and changes in average household incomes), including a discussion of the top and bottom 10 performing regions;
- a brief explanation of shift-share analysis; and
- data on interstate migration for the period 1986 to 1991.

B.1 Some broad regional comparisons

This section provides an overview of the major distinguishing characteristics and performances of regions in Canada, the United States, France, Italy and the United Kingdom relative to the performance of Australia's states.[3] Due to the difficulty of obtaining detailed regional data for countries other than Australia, the analysis is undertaken at a fairly aggregated level. Nevertheless, the data are sufficiently comparable to draw some broad observations about how the regional distribution of economic activity differs across countries at a point in time, as well as how the growth experiences of regions have varied over time.

3 Throughout this appendix, 'state' encompasses Australia's two major territories (ACT and NT) in addition to the six states — unless otherwise specified.

The regional groupings are as follows: eight states for Australia, twelve provinces for Canada, eight regional groupings of states for the United States, eight regions for France and eleven regions in both Italy and the United Kingdom. The variables used are: regional shares and growth rates of national population and GDP as well as changes in GDP per capita and unemployment rates. Values for these variables are reported for 1980 and 1995, or nearest available years.

Before the international data are discussed it is instructive to briefly canvass the relative economic performance of Australia's states. Australia's states share many common characteristics. But they also exhibit marked differences, including in: land area and quality; mineral and other natural resources; climate; tourist attractions; and geographic proximity to Asia Pacific markets. Moreover, population is not shared evenly between states, with around 60 per cent of Australians living in two states — New South Wales and Victoria (table B.1).

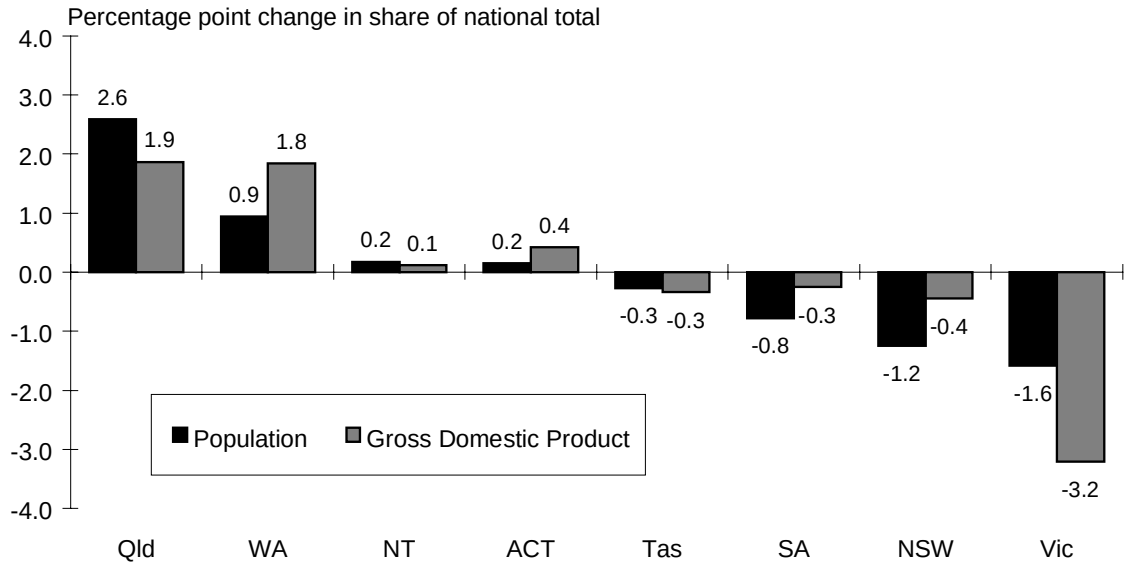
GDP shares parallel population shares for all states (table B.1). Nevertheless, interstate variations in income per head do exist. These ranged from 27 per cent above the national average in the ACT to 18 per cent below in Tasmania in 1995-96. These differences are not a recent phenomenon, with a similar degree of variation evident in 1980-81. Unemployment rates also varied between states in 1995-96, with Tasmania registering the highest, at 10 per cent, and the Northern Territory the lowest, at 7.1 per cent (table B.2).

Growth in population and GDP was not uniform across the country between 1980-81 and 1995-96. Queensland and Western Australia grew substantially faster than Tasmania, Victoria, South Australia and New South Wales (table B.1). As a result, between 1980-81 and 1995-96, Queensland and Western Australia's shares of Australia's population and GDP increased, largely at the expense of Victoria, New South Wales and South Australia (figure B.1).

Changes in population and GDP levels between states have not tracked each other evenly. Of the four states with higher than average growth, two of them (Western Australia and the ACT) experienced faster rises in GDP than population. This resulted in rising per capita incomes over the period. In contrast, Queensland and the Northern Territory increased their population at a faster rate than GDP, resulting in falling per capita incomes relative to the national average (table B.2).

An examination of international data indicate that Australia's regional experience is not unique. Key differences in the regional distribution of economic activity and changes between 1980 and 1995 across Canada, the United States, France, Italy and the United Kingdom are summarised below.

Figure B.1 **Shifts in population and GDP shares of Australian states, 1980-81 to 1995-96**



Data source: PC estimates based on data reported in table B.1.

- Canada — economic activity is heavily concentrated in Ontario and Quebec. These two regions account for over 60 per cent of the nation's population and GDP (table B.1). Substantial variations in provincial per capita incomes and unemployment rates are also evident. Unemployment rates ranged from a high of 20.4 per cent in Newfoundland to a low of 7 per cent in Saskatchewan in 1995. Interestingly, the provinces that registered the strongest rates of GDP growth also generally had below average per capita incomes at the start of the period (table B.2). This resulted in a noticeable convergence of per capita incomes over the period.
- United States[4] — although economic activity is substantially more dispersed in the United States than Australia, there are clear demographic and economic differences between regions. States along the Atlantic and Pacific coastlines (eg California, New York and Pennsylvania) tend to have the largest shares of population and national production. Sustained variations in GDP per capita and unemployment rates are also evident. In 1995, GDP per capita averaged 13.8 per cent above the national average in the Mid-Eastern states (eg New York and Pennsylvania) compared with 10.3 per cent below in the South-Eastern states

4 Data are presented on the basis of Bureau of Economic Analysis (US Dept of Commerce) divisions, which groups the 51 US states into eight divisions. Each division represents a compilation of states that are proximate to each other and have sufficient common features to warrant treatment as regions.

Table B.1 **International comparisons of regional distribution of activity and economic performance, 1980 and 1995[a]**

	Population			*GDP*		
	Shares		*Growth*	*Shares*		Growth[b]
	1980	*1995*	*per cent*	*1980*	*1995*	*Index*
Australia	**100.0**	**100.0**	**22.8**	**100.0**	**100.0**	**100.0**
New South Wales	35.1	33.9	18.5	35.0	34.6	98.2
Victoria	26.5	24.9	15.5	29.3	26.1	84.6
Queensland	15.6	18.2	43.2	14.1	16.0	118.5
South Australia	8.9	8.1	12.0	7.5	7.3	95.6
Western Australia	8.7	9.6	36.2	8.9	10.8	128.9
Tasmania	2.9	2.6	11.4	2.5	2.1	80.6
Northern Territory	0.8	1.0	48.4	0.9	1.0	117.7
Australian Capital Territory	1.5	1.7	35.3	1.7	2.1	135.0
Canada	**100.0**	**100.0**	**17.5**	**100.0**	**100.0**	**100.0**
Newfoundland	2.3	2.0	1.0	1.4	1.3	91.4
Prince Edward Island	0.5	0.5	8.1	0.3	0.3	131.2
Nova Scotia	3.4	3.2	9.5	2.2	2.5	125.5
New Brunswick	2.8	2.6	7.2	1.7	2.0	129.6
Quebec	26.4	24.9	10.9	22.5	22.3	98.8
Ontario	35.5	37.4	23.6	36.5	40.3	120.1
Manitoba	4.2	3.9	9.0	3.7	3.4	83.1
Saskatchewan	3.9	3.5	3.9	4.2	3.1	50.6
Alberta	9.3	9.3	17.9	14.5	11.0	53.3
British Columbia	11.4	12.5	29.3	12.4	13.3	114.2
Yukon	0.1	0.1	25.0	0.1	0.1	82.9
Northwest Territories	0.2	0.2	33.3	0.3	0.3	108.2
United States	**100.0**	**100.0**	**14.9**	**100.0**	**100.0**	**100.0**
New England	5.5	5.1	7.4	5.2	5.7	114.3
Mideast	18.6	17.1	5.2	19.3	19.4	101.4
Great Lakes	18.4	16.6	3.5	17.7	16.3	86.2
Plains	7.6	7.0	6.0	7.3	6.7	85.3
Southeast	23.2	24.1	19.2	20.2	21.6	112.0
Southwest	9.4	10.5	29.0	10.7	9.9	87.8
Rocky Mountains	2.9	3.1	22.7	3.1	2.9	91.0
Far West	14.4	16.5	32.0	16.5	17.5	110.2

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Table B.2 **(Continued)**

	Population			*GDP*		
	Shares		*Growth*	*Shares*		Growth[b]
	1980	*1995*	*per cent*	*1980*	*1995*	*Index*
France	**100.0**	**100.0**	**8.2**	**100.0**	**100.0**	**100.0**
Ile de France (Paris)	18.8	18.9	9.1	26.6	29.3	116.8
Paris Basin	18.3	18.0	6.2	17.6	16.0	85.3
North	7.3	6.9	1.9	6.3	5.7	83.6
East	9.2	8.8	3.3	9.1	8.1	81.2
West	13.2	13.2	8.1	10.8	11.0	102.3
South-West	10.4	10.5	9.0	8.6	8.9	105.7
Centre-East	11.7	11.9	10.1	11.1	11.1	99.0
Mediterranean	11.1	11.9	15.9	9.8	10.0	102.5
Italy	**100.0**	**100.0**	**2.2**	**100.0**	**100.0**	**100.0**
North-West	11.4	10.6	-4.6	14.2	12.2	78.9
Lombardy	15.7	15.6	1.5	20.4	20.1	97.7
North-East	11.4	11.4	2.6	12.1	13.8	122.1
Emilia-Romagna	6.9	6.8	0.7	8.7	8.8	100.9
Central	10.2	10.1	1.2	10.8	10.6	96.4
Rome	8.9	9.1	4.3	9.1	10.0	116.1
Abruzzo-Molise	2.8	2.8	3.4	2.2	2.4	114.7
Campania	9.6	10.0	7.0	6.5	6.5	99.2
South	11.6	11.8	3.9	7.9	7.7	97.4
Sicily	8.8	8.9	3.4	6.0	5.7	92.3
Sardinia	2.8	2.9	5.3	2.1	2.1	102.9
United Kingdom	**100.0**	**100.0**	**4.8**	**100.0**	**100.0**	**100.0**
North	5.5	5.3	0.4	5.2	4.6	77.2
Yorkshire/Humberside	8.7	8.6	3.0	8.0	7.8	94.4
East Midlands	6.8	7.0	9.1	6.4	6.6	107.5
East Anglia	3.4	3.6	12.9	3.1	3.6	128.1
South-East	30.2	30.7	6.5	34.7	36.1	107.4
South-West	7.8	8.2	11.1	7.3	7.9	116.6
West Midlands	9.2	9.1	2.9	8.3	8.4	102.6
North-West	11.5	10.9	-0.6	11.3	9.8	76.1
Wales	5.0	5.0	5.0	4.6	4.1	82.4
Scotland	9.2	8.8	-0.3	9.1	8.8	93.8
Northern Ireland	2.8	2.8	6.6	2.1	2.3	116.7

a Due to limitations on data availability, years vary slightly between countries — Australian data relate to financial years 1980-81 and 1995-96; Canadian data relate to calendar years 1981 and 1994; US data relate to calendar years 1980 and 1994; and data for all European countries relate to calender years 1980 and 1995. GDP growth is measured in domestic currency in current prices. **b** Index of increase in nominal GDP for each region relative to national average — national average increase = 100.

Sources: ABS (*Australian National Accounts: State Accounts*, Cat. no. 5220.0; *The Labour Force, Australia*, Cat. no. 6203.0); Eurostat (1998); US Bureau of the Census (1998); Statistics Canada (1997).

Table B.3 **International comparisons of regional GDP per capita and unemployment rates, 1980 and 1995[a]**

	GDP per capita (country average = 100)		*Unemployment rate (per cent)*	
	1980	*1995*	*1980*	*1995*
Australia	**100.0**	**100.0**	**5.9**	**8.4**
New South Wales	99.8	102.1	5.3	7.8
Victoria	110.5	104.6	5.8	8.8
Queensland	90.6	88.0	6.0	9.3
South Australia	84.8	89.8	7.7	9.5
Western Australia	103.0	112.1	5.9	7.6
Tasmania	86.0	81.7	6.1	10.0
Northern Territory	109.3	102.0	4.5	7.1
Australian Capital Territory	112.1	127.1	5.9	7.5
Canada	**100.0**	**100.0**	**7.6**	**10.4**
Newfoundland	58.8	65.3	13.9	20.4
Prince Edward Island	56.0	70.8	11.4	17.2
Nova Scotia	63.1	76.8	10.2	13.3
New Brunswick	61.0	77.2	11.6	12.5
Quebec	85.2	89.6	10.5	12.2
Ontario	102.9	108.0	6.6	9.6
Manitoba	88.2	86.7	6.0	9.2
Saskatchewan	106.4	89.2	4.7	7.0
Alberta	157.2	118.3	3.9	8.6
British Columbia	109.1	106.4	6.7	9.4
Yukon	139.0	118.9	na	na
Northwest Territories	130.1	119.6	na	na
United States	**100.0**	**100.0**	**7.1**	**5.4**
New England	96.2	111.8	6.0	4.8
Mideast	103.4	113.8	7.4	5.8
Great Lakes	96.4	98.1	9.3	4.7
Plains	96.3	95.1	5.8	4.1
Southeast	86.8	89.7	6.8	5.2
Southwest	113.9	94.1	5.5	5.6
Rocky Mountains	106.0	93.8	6.2	4.3
Far West	114.7	106.0	7.0	6.9

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Table B.4 **(Continued)**

	GDP per capita (country average = 100)		*Unemployment rate (per cent)*	
	1980	*1995*	*1980*	*1995*
France	**100.0**	**100.0**	**4.8**	**11.3**
Ile de France (Paris)	141.9	154.7	4.8	10.1
Paris Basin	96.0	89.1	4.2	12.0
North	87.0	83.3	5.6	15.4
East	98.3	91.3	3.8	8.8
West	82.4	83.5	4.7	10.5
South-West	82.5	84.6	5.1	11.1
Centre-East	95.6	93.3	3.9	10.2
Mediterranean	88.7	84.0	6.9	14.8
Italy	**100.0**	**100.0**	**6.4**	**11.9**
North-West	124.8	115.4	3.2	8.6
Lombardy	130.2	129.3	2.6	6.0
North-East	106.1	121.1	3.8	5.9
Emilia-Romagna	125.6	128.4	4.6	6.3
Central	105.9	104.6	3.8	7.9
Rome	101.9	110.5	6.7	12.6
Abruzzo-Molise	78.4	85.1	8.2	10.7
Campania	67.8	64.5	16.8	25.6
South	67.7	65.6	9.4	18.6
Sicily	68.8	64.7	11.8	23.1
Sardinia	73.3	72.7	10.2	20.6
United Kingdom	**100.0**	**100.0**	**5.7**	**8.8**
North	94.6	86.3	7.9	11.0
Yorkshire/Humberside	92.1	90.8	5.3	9.1
East Midlands	94.2	94.2	4.7	7.8
East Anglia	93.3	100.0	4.7	6.7
South-East	115.0	117.7	4.1	8.6
South-West	93.7	96.3	6.0	7.6
West Midlands	90.0	92.9	5.4	8.8
North-West	97.6	89.4	6.9	9.2
Wales	91.8	82.7	7.2	8.7
Scotland	98.4	99.9	7.6	8.8
Northern Ireland	75.5	81.0	9.7	13.0

a Due to limitations on data availability, years vary slightly between countries — Australian data relate to financial years 1980-81 and 1995-96; Canadian data relate to calendar years 1981 and 1994; US data relate to calendar year 1980 for both variables and 1994 for GDP per capita and 1996 for unemployment rates; and GDP per capita data relate to calendar years 1980 and 1995 for all European countries and 1977 and 1995 for unemployment rates.

Sources: ABS (*Australian National Accounts: State Accounts*, Cat. no. 5220.0; *The Labour Force, Australia*, Cat. no. 6203.0); Eurostat (1998); US Bureau of the Census (1998); Statistics Canada (1997).

(eg Mississippi, Virginia and Georgia). However, the variations were smaller than in Australia, partly reflecting the aggregated nature of the data.

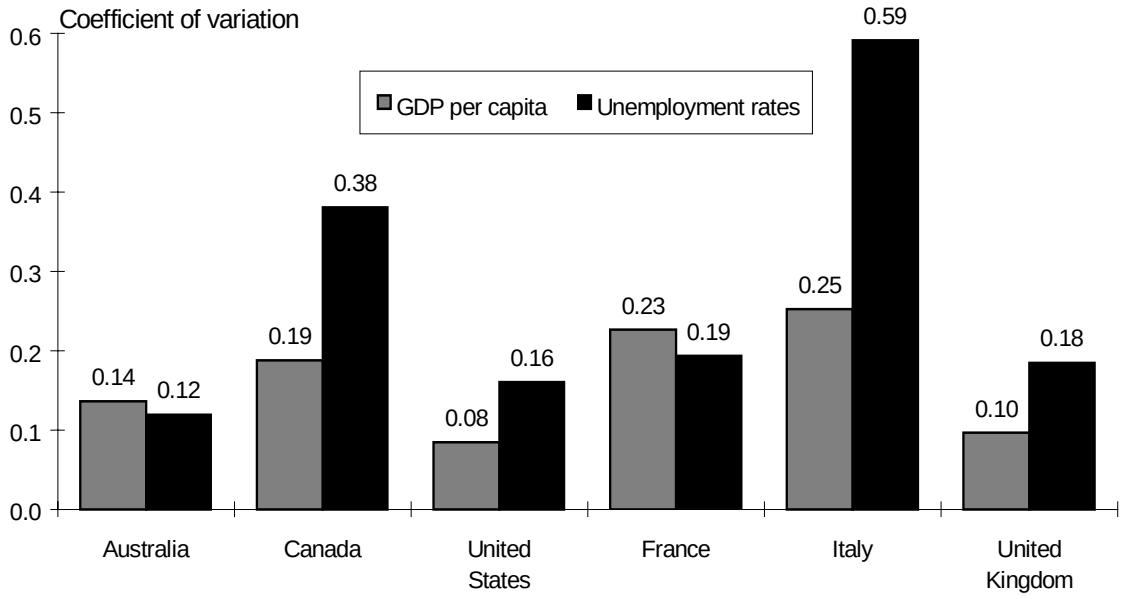
- France — in general, the regional distribution of population and GDP in France displays less variability relative to the other countries. However, the two Paris-based regions (ie Ile de France and Paris Basin) dominate — accounting for almost 40 per cent of the country's population and over 45 per cent of GDP. In 1995, GDP per capita for Ile de France was 55 per cent above the national average — an increase of 13 percentage points since 1980. Between 1980 and 1995, five of the seven regions in France with below average incomes actually saw their GDP per capita rates drop further below the national average. Over the same period, unemployment rates rose sharply (table B.2).
- Italy — in contrast to France's urban-rural divide, Italy exhibits a clear north-south division in regional economic performance. For example, the northern Italian regions typically registered GDP per capita rates of 20–30 per cent above the national average and unemployment rates as low as half the national average. In contrast, southern regions, including Campania (Naples), Sicily and Sardinia registered GDP per capita levels of just over half of those in the north and unemployment rates up to four times higher (25.6 per cent in Campania) This divide is longstanding. The differences in regional unemployment and income have remained broadly the same over the past decade and a half (table B.2).
- United Kingdom — a distinctive feature of the distribution of economic activity and population within the United Kingdom is the dominance of the South-East region — which includes the city of London. This region accounts for some 31 per cent of the nation's population and generates over 36 per cent of GDP. The next largest region, on a population and GDP share basis, is the North-West region, which has about a 10 per cent share of each. The South-East region has the highest level of GDP per capita, at 18 per cent above the national average in 1995. The poorest regions were Northern Ireland, Wales and the North, with GDP per capita rates around 20 per cent below the national average. There has been no clear pattern of convergence or divergence in per capita income relativities or unemployment rates between 1980 and 1995.

In summary, the data on regional economic performance across the selected countries indicate that activity within nations is not evenly distributed, with a few subnational jurisdictions often holding disproportionately large shares of population and GDP. This outcome is more pronounced in Australia, Canada, the United Kingdom and France than in the United States and Italy.

Despite this, variations in regional GDP per capita and unemployment rates tend to be smaller in Australia. Figure B.2 compares a standardised measure of variation in regional unemployment rates and per capita GDP for Australia and the overseas

countries referred to above. In 1995-96, Australian states exhibited relatively low variation in per capita GDP (fourth of six) and the lowest variation in unemployment rates — around one-third of the variation exhibited by Canada, and one-fifth of that exhibited by Italy.

Figure B.2 **Regional variation in unemployment rates and GDP per capita across a selection of OECD countries, 1995**



Data source: PC estimates based on data reported in table B.2.

The more detailed analysis presented in chapter 3 confirms that the level of aggregation employed above masks much of the variation in regional performance in Australia. Nevertheless, these results are broadly consistent with the findings of a number of studies that have compared Australian regional disparities with those in other countries (see Ferry 1991; King and Armstrong 1993; Maxwell and Peter 1988; Williamson 1965).

Although Australia generally displayed less variation in income per capita and unemployment levels at the state level, it displayed considerably more variation in GDP and population growth rates. As noted above, differences in growth rates between states resulted in shifts in population and GDP shares across Australia. A good summary measure of these shifts in regional shares of activity is provided by a regional change index (RCI). An explanation of RCIs is provided in box B.1.

Box B.1 **Regional change index — an explanation**

The RCI is one method for measuring the extent to which a country's regional distribution of population, employment or output has changed over time. The RCI for a given variable, such as population, may be defined as half the sum of the absolute value of the differences in regional population shares over time. The calculation is given by the formula:

$$RCI = \frac{1}{2} \sum \left| x_{i,t} - x_{i,t-1} \right|$$

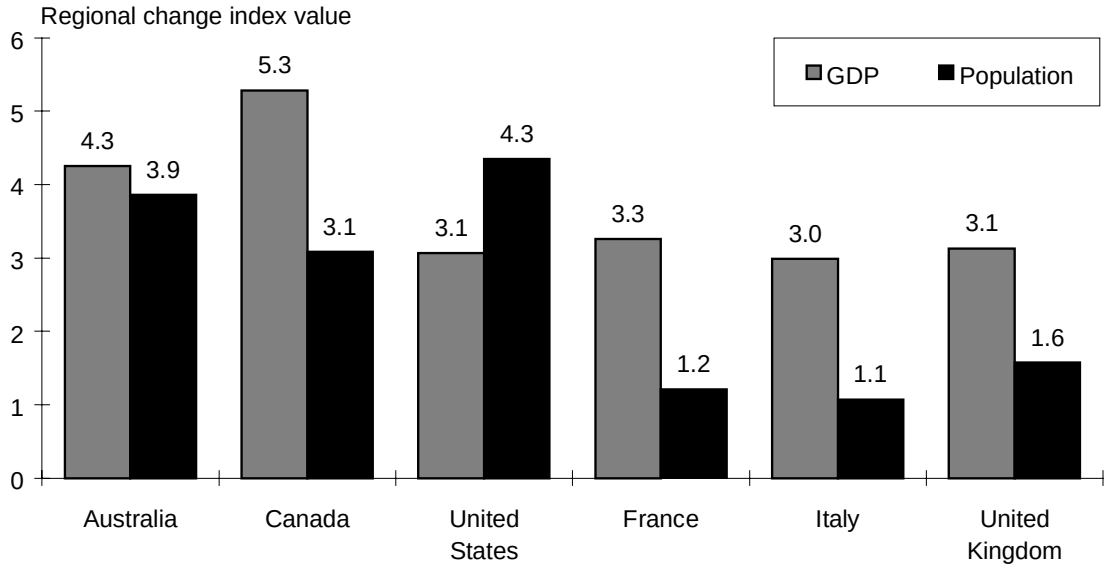
where $x_{i.t}$ and $x_{i.t-1}$ represent each region's share of total population at time (t) and (t-1), respectively. The use of absolute values ensures that positive and negative changes in regional shares do not cancel each other out when the values for all regions are summed.

This measure is conceptually identical to the SCI reported in chapters 2 and 3 and explained in appendix A, although the interpretation differs slightly. Assume for example, that a country registered a RCI of 10, based on changes in its regional population shares over a given period. This means that, at the end of the period, 10 per cent of the national population would have to be moved into different regions in order to re-establish the regional distribution of population prevailing at the start of the period. As with SCIs, the size of the RCI is affected by the level of regional aggregation selected — with a finer regional specification typically yielding a greater degree of measured change.

The RCI covering Australia's GDP indicates that 4.3 per cent of Australia's national production in 1995-96 would have to be moved into different states in order to re-establish the distribution of production prevailing in 1980-81 (figure B.3). The population RCI of 3.9 for the same period can be interpreted in a similar fashion. Overall, Australia registered the second largest RCIs for GDP and population — behind Canada (with a RCI of 5.3 for GDP) and the United States (with a RCI of 4.3 for population). A noticeable feature of the results was the stability in population shares of the three European countries examined, with RCIs of only 1.1 to 1.6 (figure B.3).

All of these results are affected by the level of aggregation used. As with SCIs, a lower level of aggregation reveals a greater degree of change. This was confirmed by estimating RCIs for Australia using the regional breakup employed in chapter 3. The resulting RCIs for working age population, employment and unemployment were 5.9, 6.5 and 8.4 respectively.

Figure B.3 **Comparison of shifts in regional GDP and population shares within a selection of OECD countries, 1980 to 1995**



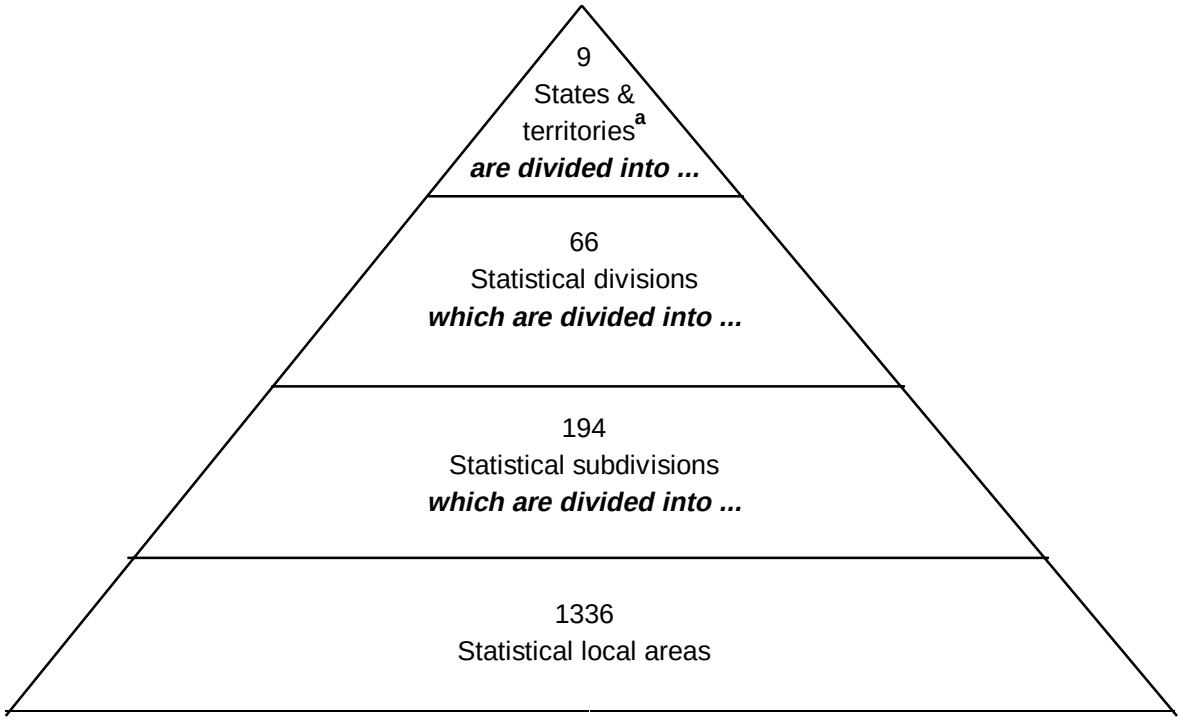
Data source: PC estimates based on data reported in table B.1.

B.2 Regional classifications

Much of the data used in chapter 3 is derived from the ABS Census of Population and Housing. In using these data, the Commission made a number of adjustments to the associated classification of regions. These adjustments are explained below.

For statistical purposes, when collecting Census data, the ABS divides Australia into a series of regions in accordance with the Australian Standard Geographical Classification (ASGC). These regions are organised in a hierarchical way, so that the largest regional type — the eight states and territories and one 'other territory' — can be broken down into 1336 statistical local areas, the smallest regional type. An overview of the regional classification and number of regions in each category is presented in figure B.4.

Figure B.4 **ABS regional classification, July 1996**



[a] Comprises the six states, two territories and an 'other territories' category which consists of Jervis Bay, Christmas Island and the Cocos (Keeling) Islands.

Data source: ABS (*Statistical Geography: Volume 1, Australian Standard Geographical Classification*, Cat. no. 1216.0).

The analysis presented in chapter 3 uses data at two levels — statistical divisions for the eight capital cities which make up the metropolitan regions and statistical subdivisions (SSDs) for the 105 non-metropolitan regions. In the 1996 Census, the ABS divided Australia into a total of 194 SSDs, but adjustments made for the purposes of this report have reduced the number as follows:

- 59 SSDs were aggregated into 8 capital city regions;
- 7 'Offshore and migratory' and 1 'Other territories' SSDs were discarded due to their small size and unique industry composition; and
- 22 non-metropolitan SSDs were subsumed into adjoining SSDs to resolve data consistency issues associated with changes to the ASGC between 1981 and 1996.

These changes resulted in a reduction in the number of available SSD-based regions to 113. Table B.3 shows the classification of regions used in this report and the equivalent ABS classification that was used in the 1996 Census.

Table B.5 **Productivity Commission and equivalent ABS regional classifications[a,b]**

State/ territory	*Productivity Commission classification*	*Equivalent ABS statistical subdivision*
NEW SOUTH WALES		
	Sydney	Inner Sydney
		Eastern Suburbs
		St George-Sutherland
		Canterbury-Bankstown
		Fairfield-Liverpool
		Outer South Western Sydney
		Inner Western Sydney
		Central Western Sydney
		Outer Western Sydney
		Blacktown-Baulkham Hills
		Lower Northern Sydney
		Hornsby-Ku-ring-gai
		Northern Beaches
		Gosford-Wyong
	Newcastle	Newcastle
	Hunter Balance	Hunter SD Balance
	Wollongong	Wollongong
	Illawarra Balance	Illawarra SD Balance
	Tweed Heads	Tweed Heads
	Richmond-Tweed Balance	Richmond-Tweed SD Balance
	Clarence	Clarence
	Hastings	Hastings
	Northern Slopes	Northern Slopes
	Northern Tablelands	Northern Tablelands
	North Central Plain	North Central Plain
	Central Macquarie	Central Macquarie
	Macquarie-Barwon	Macquarie-Barwon
	Upper Darling	Upper Darling
	Bathurst-Orange	Bathurst-Orange
	Central Tablelands	Central Tablelands
	Lachlan	Lachlan
	Queanbeyan	Queanbeyan
	Southern Tablelands (excl. Queanbeyan)	Southern Tablelands (excl. Queanbeyan)
	Lower South Coast	Lower South Coast
	Snowy	Snowy
	Central Murrumbidgee	Central Murrumbidgee
	Lower Murrumbidgee	Lower Murrumbidgee
	Albury	Albury
	Upper Murray (excl. Albury)	Upper Murray (excl. Albury)
	Central Murray	Central Murray
	Murray-Darling	Murray-Darling
	Far West	Far West

(Continued next page)

Table B.6 **(Continued)**

State/ territory	*Productivity Commission classification*	*Equivalent ABS statistical subdivision*
VICTORIA		
	Melbourne	Inner Melbourne
		Western Melbourne
		Melton-Wyndham
		Moreland City
		Northern Middle Melbourne
		Hume City
		Northern Outer Melbourne
		Boroondara City
		Eastern Middle Melbourne
		Eastern Outer Melbourne
		Yarra Ranges Shire
		Southern Melbourne
		Greater Dandenong City
		South Eastern Outer Melbourne
		Frankston City
		Mornington Peninsula Shire
	Greater Geelong City Part A	Greater Geelong City Part A
	Barwon	East Barwon
		West Barwon
	Hopkins/Glenelg	Hopkins
		Glenelg
	Ballarat City	Ballarat City
	East Central Highlands	East Central Highlands
	West Central Highlands	West Central Highlands
	South Wimmera	South Wimmera
	North Wimmera	North Wimmera
	Mildura/Mallee	Mildura Rural City Part A
		West Mallee
		East Mallee
	Greater Bendigo City Part A	Greater Bendigo City Part A
	North Loddon	North Loddon
	South Loddon	South Loddon
	Greater Shepparton/North Goulburn	Greater Shepparton City Part A
		North Goulburn
	South-SW Goulburn	South Goulburn
		South West Goulburn
	Wodonga	Wodonga
	Ovens-Murray	West Ovens-Murray
		East Ovens-Murray
	East Gippsland	East Gippsland Shire
		Wellington Shire
	Gippsland	La Trobe Valley
		West Gippsland
		South Gippsland

(Continued next page)

Table B.7 **(Continued)**

State/ territory	*Productivity Commission classification*	*Equivalent ABS statistical subdivision*
QUEENSLAND		
	Brisbane	Brisbane City
		Gold Coast City Part A
		Beaudesert Shire Part A
		Caboolture Shire Part A
		Ipswich City (Part in BSD)
		Logan City
		Pine Rivers Shire
		Redcliffe City
		Redland Shire
	Gold Coast	Gold Coast City Part B
	Sunshine Coast	Sunshine Coast
	Moreton Balance	Moreton SD Balance
	Bundaberg	Bundaberg
	Wide Bay-Burnett Balance	Wide Bay-Burnett SD Balance
	Darling Downs	Toowoomba City
		Darling Downs SD Balance
	South West	South West
	Rockhampton	Rockhampton
	Gladstone	Gladstone
	Fitzroy Balance	Fitzroy SD Balance
	Central West	Central West
	Mackay City Part A	Mackay City Part A
	Mackay Balance	Mackay SD Balance
	Townsville/Thuringowa	Townsville City Part A
		Thuringowa City Part A
	Northern Balance	Northern SD Balance
	Cairns City Part A	Cairns City Part A
	Far North	Far North SD Balance
	North West	North West
SOUTH AUSTRALIA		
	Adelaide	Northern
		Western
		Eastern
		Southern
	Barossa	Barossa
	Outer Adelaide	Kangaroo Island
		Onkaparinga
		Fleurieu
	Yorke	Yorke
	Lower North	Lower North
	Riverland	Riverland
	Murray Mallee	Murray Mallee
	Upper South East	Upper South East
	Lower South East	Lower South East
	Lincoln/West Coast	Lincoln
		West Coast

(Continued next page)

Table B.8 **(Continued)**

State/ territory	*Productivity Commission classification*	*Equivalent ABS statistical subdivision*
	Whyalla	Whyalla
	Flinders Ranges/Pirie	Pirie
		Flinders Ranges
	Far North	Far North
WESTERN AUSTRALIA		
	Perth	Central Metropolitan
		East Metropolitan
		North Metropolitan
		South West Metropolitan
		South East Metropolitan
	Dale	Dale
	Preston	Preston
	Vasse	Vasse
	Blackwood	Blackwood
	Pallinup	Pallinup
	King	King
	Hotham/Lakes	Hotham
		Lakes
	Moore	Moore
	Avon	Avon
	Campion	Campion
	Lefroy	Lefroy
	Johnston	Johnston
	Gascoyne/Carnegie	Gascoyne
		Carnegie
	Greenough River	Greenough River
	De Grey	De Grey
	Fortescue	Fortescue
	Ord	Ord
	Fitzroy	Fitzroy
TASMANIA		
	Greater Hobart	Greater Hobart
	Southern	Southern
	Greater Launceston	Greater Launceston
	Central North	Central North
	North Eastern	North Eastern
	Burnie-Devonport	Burnie-Devonport
	North Western Rural	North Western Rural
	Lyell	Lyell
NORTHERN TERRITORY		
	Darwin	Darwin City
		Palmerston-East Arm
	North-West NT	Darwin Rural Areas
		Bathurst-Melville

(Continued next page)

Table B.9 **(Continued)**

State/ territory	*Productivity Commission classification*	*Equivalent ABS statistical subdivision*
		Daly
	Arnhem	Alligator
		East Arnhem
	Lower Top End/Barkly NT	Lower Top End NT
		Barkly
	Central NT	Central NT
AUSTRALIAN CAPITAL TERRITORY		
	Canberra	North Canberra
		Belconnen
		Woden Valley
		Weston Creek-Stromlo
		Tuggeranong
		South Canberra
		Gungahlin-Hall
		ACT Balance

a The ABS classification system was effective at 1 July 1996 and was the system used for the 1996 Census. **b** Offshore Areas & Migratory and Other Territories have been omitted.

Source: ABS (*Statistical Geography: Volume 1, Australian Standard Geographical Classification*, Cat. no. 1216.0).

B.3 Regional performance and industry structure data

This section presents some key data on performance and industry structure for the 113 regions examined in chapter 3. The regions are sorted according to their SCIs for the period 1981 to 1996 (from the region with the highest to lowest SCI).

Table B.4 provides SCI values and employment growth rates between 1981 and 1996 as well as estimates of regional average household incomes and unemployment rates for both years based on ABS Census of Population and Housing data.

Table B.5 breaks down regional employment into percentage shares for the four broad sectors — agriculture, mining, manufacturing and services — for 1981 and 1996.

Table B.10 **Regional SCI rankings and performance data, 1981 to 1996**

	SCI	*Employment growth*	*Average household incomes*		*Unemployment rate*	
Region	*1981–96*	*1981–96*	*1981*	*1996*	*1981*	*1996*
	%	%	'000	'000	%	%
Lyell (Tas)	37.4	-58.2	20.8	33.8	3.5	9.9
Fitzroy (WA)	34.4	80.8	25.4	45.1	7.5	6.4
Arnhem (NT)	30.9	-5.7	28.6	54.9	3.2	5.4
Fortescue (WA)	30.5	-5.8	32.8	57.9	4.6	5.1
Wollongong (NSW)	29.8	3.6	17.0	37.3	7.0	11.6
Gascoyne/Carnegie (WA)	27.2	37.2	21.2	36.1	6.1	5.9
Far West (NSW)	26.6	-31.1	15.4	28.0	7.5	13.5
Far North (SA)	26.4	19.2	14.6	40.4	9.3	7.7
Dale (WA)	25.9	127.7	10.1	25.6	6.8	13.0
Lower Top End/Barkly (NT)	25.7	48.8	18.9	44.4	4.8	7.6
De Grey (WA)	24.7	-11.5	29.3	64.9	5.6	5.6
North-West (NT)	24.1	168.0	15.4	40.7	5.2	10.4
South-SW Goulburn (Vic)	24.0	24.6	12.7	28.8	4.2	8.6
Ord (WA)	23.8	41.6	24.4	48.3	4.9	4.6
Whyalla (SA)	23.3	-28.1	16.0	31.3	9.1	13.9
Flinders Ranges/Pirie (SA)	23.2	-21.8	15.0	27.4	6.3	14.1
Vasse (WA)	22.7	111.1	10.3	27.7	5.8	8.4
Lefroy (WA)	22.6	70.1	18.6	68.7	5.7	5.4
Moore (WA)	22.3	16.3	11.2	22.3	3.7	9.0
North Western Rural (Tas)	22.1	4.8	14.6	29.7	6.6	10.8
Gippsland (Vic)	22.0	-10.7	14.0	25.8	4.3	12.3
Upper Darling (NSW)	21.7	0.4	14.9	36.1	10.5	8.8
Gladstone (Qld)	21.4	28.6	20.7	41.9	4.6	9.0
West Central Highlands (Vic)	21.4	-27.5	13.6	24.8	5.7	10.9
North Loddon (Vic)	21.4	34.2	12.2	24.3	6.8	13.4
Campion (WA)	20.9	-10.0	15.9	44.1	2.8	4.1
Far North (Qld)	20.8	44.1	15.5	35.0	7.3	7.9
Mackay Bal (Qld)	20.7	40.3	21.7	50.7	4.0	6.4
Outer Adelaide (SA)	20.7	43.5	11.8	26.3	5.9	10.1
Greenough River (WA)	20.6	15.1	15.5	33.2	6.4	10.3
East Central Highlands (Vic)	20.5	65.3	11.2	28.6	6.2	11.1
Ovens-Murray (Vic)	20.4	18.5	13.7	38.0	5.4	6.7
Lower North (SA)	20.4	-11.4	13.4	27.0	4.3	8.1
Central Tablelands (NSW)	20.1	-5.3	14.7	31.7	5.2	9.3
Southern (Tas)	20.0	7.7	9.5	20.0	8.8	12.5
Blackwood (WA)	19.9	8.3	13.4	29.2	3.4	6.3
Newcastle (NSW)	19.8	10.4	15.8	34.9	5.9	11.6
North West (Qld)	19.5	-0.4	19.5	48.2	4.0	6.0
Cairns City Part A (Qld)	19.4	98.3	17.8	41.7	7.7	8.3
Central West (Qld)	19.2	-11.2	15.1	33.1	3.7	6.6
Moreton Bal (Qld)	19.1	74.7	13.0	30.0	5.8	11.3
Townsville/Thuringowa (Qld)	18.8	32.8	16.9	39.2	6.2	9.4
King (WA)	18.8	23.5	12.9	27.8	6.6	9.5

(Continued next page)

Table B.11 **(Continued)**

Region	SCI 1981–96	Employment growth 1981–96	Average household incomes 1981	Average household incomes 1996	Unemployment rate 1981	Unemployment rate 1996
	%	%	'000	'000	%	%
Snowy (NSW)	18.7	59.9	18.4	58.0	4.5	5.3
Wodonga (Vic)	18.5	33.5	16.2	34.8	5.2	10.1
Lincoln/West Coast (SA)	18.5	-11.8	14.0	26.6	5.9	10.4
Upper Murray (Vic)	18.4	-0.4	13.5	27.0	4.5	7.1
Central North (Tas)	18.1	24.5	11.5	25.5	6.7	12.0
Preston (WA)	18.0	40.6	15.8	36.1	5.2	8.2
Wide Bay-Burnett Bal (Qld)	18.0	32.9	13.4	26.4	5.2	14.9
Illawarra Bal (NSW)	17.9	47.4	11.2	25.0	7.6	12.0
Bundaberg (Qld)	17.9	25.6	14.0	29.9	7.1	14.8
Johnston (WA)	17.8	9.0	16.1	32.8	5.2	7.5
Fitzroy Bal (Qld)	17.8	23.1	16.8	38.8	4.9	7.9
Greater Geelong City (Vic)	17.8	8.1	15.2	33.9	8.0	12.0
South Loddon (Vic)	17.8	52.9	14.8	38.9	4.3	7.2
Albury (NSW)	17.7	14.4	15.8	34.6	6.3	10.3
Barwon (Vic)	17.7	47.0	10.6	24.7	6.2	9.9
Yorke (SA)	17.6	-10.6	9.0	17.2	6.3	13.6
Barossa (SA)	17.6	38.3	13.6	34.4	5.9	7.3
Greater Bendigo City (Vic)	17.6	19.0	14.1	30.8	7.0	13.0
Hastings (NSW)	17.4	32.4	12.7	26.8	9.6	16.2
Macquarie-Barwon (NSW)	17.4	-11.8	14.0	24.0	8.3	13.5
Avon (WA)	17.3	-4.7	15.2	30.4	3.7	7.0
Northern Bal (Qld)	17.2	19.1	16.4	34.4	5.5	7.3
North Eastern (Tas)	17.1	-17.1	9.9	19.4	6.5	12.2
Southern Tablelands (NSW)	16.9	-1.8	14.2	30.6	5.6	7.6
Murray Mallee (SA)	16.9	-2.1	11.4	22.8	5.8	10.3
Hopkins/Glenelg (Vic)	16.8	-1.7	13.7	30.4	6.4	8.8
Clarence (NSW)	16.7	35.9	13.3	27.2	10.2	17.1
Hunter Bal (NSW)	16.6	21.6	14.2	32.0	4.8	9.9
Rockhampton (Qld)	16.4	15.5	15.4	33.9	5.9	10.5
East Gippsland (Vic)	16.3	29.5	12.8	25.7	6.0	11.9
Darwin	16.2	47.1	22.7	49.9	4.9	7.7
Burnie-Devonport (Tas)	16.2	3.2	13.8	28.8	8.6	13.2
Melbourne	16.2	13.1	16.6	40.9	5.4	9.1
North Wimmera (Vic)	16.2	-30.9	14.6	27.7	3.3	6.3
Hotham/lakes (WA)	16.0	-18.8	16.9	35.8	2.7	4.3
South Wimmera (Vic)	16.0	6.3	14.0	29.3	5.4	7.6
Pallinup (WA)	16.0	-15.5	17.8	33.9	3.4	3.9
Richmond-Tweed Bal (NSW)	16.0	39.0	13.5	29.0	10.4	14.9
Sydney	15.7	15.4	17.4	45.7	4.9	7.4
Lower South Coast (NSW)	15.6	44.4	10.4	21.8	9.3	14.3
Upper South East (SA)	15.5	-8.6	14.4	32.2	3.1	4.2
Central Murrumbidgee (NSW)	15.4	3.2	15.5	33.0	5.9	8.4
South West (Qld)	15.4	4.0	13.6	31.2	5.6	6.3

(Continued next page)

Table B.4 **(Continued)**

Region	SCI 1981–96	Employment growth 1981–96	Average household incomes 1981	Average household incomes 1996	Unemployment rate 1981	Unemployment rate 1996
	%	%	'000	'000	%	%
Lachlan (NSW)	15.4	-10.3	13.7	28.2	6.6	9.2
Queanbeyan (NSW)	15.3	97.6	14.3	40.6	8.5	7.8
Central Murray (NSW)	15.2	0.1	15.5	29.9	4.8	7.4
Darling Downs (Qld)	15.0	21.1	13.4	32.9	5.1	7.6
Central Macquarie (NSW)	14.8	8.0	14.1	30.3	6.9	9.8
Mackay City Part A (Qld)	14.7	37.0	16.5	38.6	6.6	9.1
Greater Launceston (Tas)	14.7	11.2	14.7	31.7	6.9	11.1
Northern Slopes (NSW)	14.6	-3.1	14.4	29.7	6.0	10.1
Brisbane	14.4	49.2	16.0	39.9	5.6	8.8
Greater Hobart (Tas)	14.2	13.1	15.5	34.4	8.2	9.7
Ballarat City (Vic)	14.1	11.5	14.1	31.8	8.6	11.9
Sunshine Coast (Qld)	13.8	112.2	12.5	29.0	9.3	15.1
Murray-Darling (NSW)	13.8	1.0	15.0	29.9	7.4	8.1
Riverland (SA)	13.7	2.1	13.3	29.2	5.6	7.8
Central (NT)	13.6	56.8	20.7	46.6	5.9	5.9
North Central Plain (NSW)	13.5	-10.6	16.3	33.7	6.8	9.5
Tweed Heads (NSW)	13.3	67.0	14.6	27.1	11.4	15.9
Gold Coast (Qld)	13.2	125.6	13.5	33.1	8.9	12.5
Canberra	12.9	47.9	21.4	51.8	5.0	7.3
Lower South East (SA)	12.9	4.2	14.3	28.1	5.6	8.1
Greater Shepparton/ North Goulburn (Vic)	12.8	40.3	14.6	31.4	7.5	8.7
Northern Tablelands (NSW)	12.8	-1.6	13.9	28.7	7.9	11.2
Adelaide	12.6	11.2	15.2	35.2	8.3	10.6
Mildura/Mallee (Vic)	12.4	5.9	14.9	29.5	6.0	8.1
Perth	12.1	43.1	16.0	39.1	6.8	8.3
Bathurst-Orange (NSW)	11.6	22.5	15.2	35.7	6.6	8.2
Lower Murrumbidgee (NSW)	9.8	2.8	16.0	34.9	5.6	5.9

Sources: PC estimates based on ABS (*Integrated Regional Database, Australia 1998*, Cat. no. 1353.0; unpublished 1996 Census of Population and Housing data).

Table B.12 **Regional employment shares by sector, 1981 and 1996[a]**

	1981				1996			
Region	*Ag*	*Mining*	*Mfg*	*Serv*	*Ag*	*Mining*	*Mfg*	*Serv*
	%	%	%	%	%	%	%	%
Lyell (Tas)	0.8	45.4	0.9	52.8	2.9	34.6	3.3	59.2
Fitzroy (WA)	14.9	15.1	4.6	65.4	7.7	2.5	3.3	86.5
Arnhem (NT)	1.5	27.1	6.3	65.1	1.8	15.9	4.4	77.8
Fortescue (WA)	2.2	41.7	2.7	53.5	2.9	24.8	9.9	62.4
Wollongong (NSW)	0.7	6.8	36.7	55.8	0.7	2.7	17.2	79.5
Gascoyne/Carnegie (WA)	20.5	10.1	4.5	64.9	14.1	21.7	3.9	60.4
Far West (NSW)	9.4	33.0	2.1	55.5	10.5	9.9	3.8	75.7
Far North (SA)	16.4	19.4	2.3	62.0	6.2	21.5	2.9	69.4
Dale (WA)	13.2	1.0	25.6	60.2	4.6	6.1	17.0	72.3
Lower Top End/Barkly (NT)	19.9	11.2	6.2	62.6	10.2	5.3	3.0	81.5
De Grey (WA)	1.2	44.9	1.6	52.2	2.0	29.2	4.0	64.8
North-West (NT)	9.9	3.0	7.0	80.1	6.8	4.8	5.9	82.5
South-SW Goulburn (Vic)	20.1	0.3	11.6	68.0	11.2	0.4	13.6	74.8
Ord (WA)	19.4	7.3	8.5	64.8	10.4	9.7	3.6	76.3
Whyalla (SA)	0.8	2.0	48.5	48.8	0.9	1.7	29.9	67.4
Flinders Ranges/Pirie (SA)	15.2	3.1	15.5	66.2	14.0	2.6	9.3	74.1
Vasse (WA)	27.2	3.3	9.3	60.2	11.8	2.8	11.4	74.0
Lefroy (WA)	1.9	31.6	8.0	58.5	1.1	28.8	5.5	64.5
Moore (WA)	55.9	0.3	2.6	41.3	38.9	3.3	4.6	53.1
North Western Rural (Tas)	30.1	12.9	15.0	42.0	26.4	1.9	17.2	54.6
Gippsland (Vic)	15.0	1.5	12.9	70.6	12.8	0.7	11.1	75.4
Upper Darling (NSW)	26.6	7.5	5.2	60.6	18.6	14.2	5.2	62.0
Gladstone (Qld)	4.0	1.1	17.4	77.5	1.4	0.7	20.7	77.1
West Central Highlands (Vic)	32.7	0.1	11.7	55.5	24.4	0.9	12.9	61.8
North Loddon (Vic)	26.5	1.0	19.9	52.6	18.0	1.0	18.6	62.5
Campion (WA)	44.7	3.4	2.9	49.0	34.5	11.8	3.4	50.4
Far North (Qld)	24.0	6.7	12.2	57.1	17.3	3.2	8.2	71.2
Mackay Bal (Qld)	26.4	13.4	9.9	50.2	15.0	15.6	7.6	61.8
Outer Adelaide (SA)	25.5	0.7	14.3	59.5	14.0	0.5	12.6	72.9
Greenough River (WA)	29.0	3.3	5.3	62.4	18.3	4.0	5.4	72.3
East Central Highlands (Vic)	21.7	1.3	18.5	58.4	9.3	0.9	15.2	74.6
Ovens-Murray (Vic)	23.2	0.2	16.7	59.9	12.0	0.2	17.1	70.7
Lower North (SA)	42.5	1.0	6.7	49.7	30.9	0.7	10.5	57.9
Central Tablelands (NSW)	18.1	10.7	14.2	57.1	12.8	9.7	13.1	64.4
Southern (Tas)	31.4	0.2	11.1	57.2	24.0	0.4	11.0	64.7
Blackwood (WA)	33.9	4.1	19.1	43.0	26.5	2.8	13.8	56.8
Newcastle (NSW)	1.3	5.3	25.9	67.4	1.2	3.4	14.5	80.9
North West (Qld)	13.1	29.9	4.9	52.1	9.8	22.5	4.3	63.5
Cairns City Part A (Qld)	4.0	1.1	12.4	82.5	2.1	0.7	7.2	90.1
Central West (Qld)	42.3	1.1	1.6	55.0	30.9	1.0	2.5	65.6
Moreton Bal (Qld)	24.7	0.8	12.8	61.7	14.5	0.8	11.9	72.8
Townsville/Thuringowa (Qld)	1.7	0.7	13.3	84.2	0.9	0.9	8.4	89.8
King (WA)	27.0	0.2	8.5	64.4	18.9	0.5	7.2	73.4

(Continued next page)

Table B.5 **(Continued)**

Region	1981				1996			
	Ag	*Mining*	*Mfg*	*Serv*	*Ag*	*Mining*	*Mfg*	*Serv*
	%	%	%	%	%	%	%	%
Snowy (NSW)	16.9	0.3	6.4	76.4	8.6	0.5	6.0	84.9
Wodonga (Vic)	11.3	0.1	18.2	70.4	4.7	0.1	14.8	80.3
Lincoln/West Coast (SA)	37.8	0.6	5.7	55.9	28.4	0.7	4.7	66.2
Upper Murray (NSW)	40.5	0.3	7.8	51.3	28.7	0.1	14.4	56.7
Central North (Tas)	34.3	0.3	13.9	51.5	24.7	0.8	12.8	61.7
Preston (WA)	11.9	7.1	12.8	68.2	7.3	4.7	16.0	72.0
Wide Bay-Burnett Bal (Qld)	26.7	0.6	11.7	60.9	17.3	1.1	10.8	70.8
Illawarra Bal (NSW)	7.7	0.7	15.0	76.6	4.7	0.6	11.7	82.9
Bundaberg (Qld)	9.2	0.3	21.5	69.0	7.8	0.3	11.9	80.0
Johnston (WA)	35.6	6.8	3.8	53.8	26.9	5.9	4.7	62.4
Fitzroy Bal (Qld)	23.4	15.7	5.8	55.2	15.4	14.1	6.4	64.2
Greater Geelong (Vic)	1.2	0.2	33.4	65.1	1.1	0.2	21.0	77.7
South Loddon (Vic)	10.7	0.2	18.4	70.7	4.6	0.2	14.7	80.5
Albury (NSW)	6.0	0.2	20.2	73.6	3.5	0.1	15.4	81.0
Barwon (Vic)	20.2	0.3	15.2	64.2	10.2	0.2	14.9	74.7
Yorke (SA)	36.2	1.4	6.0	56.4	26.3	1.4	5.4	66.9
Barossa (SA)	25.5	0.8	19.8	54.0	13.0	0.6	21.4	65.0
Greater Bendigo (Vic)	2.7	0.3	20.4	76.6	2.0	0.4	13.6	84.1
Hastings (NSW)	12.4	0.5	13.3	73.8	7.1	0.3	11.2	81.4
Macquarie-Barwon (NSW)	45.2	2.1	2.3	50.4	33.3	5.0	3.1	58.6
Avon (WA)	39.2	0.5	5.3	55.0	29.3	0.9	6.9	62.8
Northern Bal (Qld)	26.5	4.5	15.6	53.4	21.5	4.2	11.9	62.4
North Eastern (Tas)	32.2	7.4	11.3	49.1	27.1	2.1	14.8	56.0
Southern Tablelands (NSW)	24.2	2.1	6.7	67.0	17.3	1.1	7.8	73.8
Murray Mallee (SA)	37.3	0.3	11.1	51.2	29.2	0.3	13.8	56.8
Hopkins/Glenelg (Vic)	32.1	0.2	11.8	55.9	23.5	0.2	11.2	65.2
Clarence (NSW)	13.6	0.2	13.2	73.0	8.6	0.2	10.0	81.2
Hunter Bal (NSW)	19.7	9.0	8.0	63.3	13.4	10.0	8.0	68.6
Rockhampton (Qld)	1.7	0.9	13.5	83.8	1.2	0.7	9.9	88.2
East Gippsland (Vic)	21.1	3.6	10.5	64.9	16.4	2.4	8.8	72.5
Darwin	0.9	1.0	5.2	92.9	0.9	1.2	5.2	92.6
Burnie-Devonport (Tas)	4.9	1.3	24.6	69.3	5.0	1.0	16.4	77.6
Melbourne	1.0	0.2	27.1	71.6	0.9	0.2	17.9	81.0
North Wimmera (Vic)	45.9	0.1	3.9	50.1	36.1	0.0	4.9	59.0
Hotham/lakes (WA)	53.0	0.1	3.0	44.0	45.6	1.3	3.7	49.3
South Wimmera (Vic)	30.0	0.3	9.2	60.6	20.6	1.3	10.1	68.1
Pallinup (WA)	52.0	0.0	4.0	44.0	44.7	0.5	7.9	46.9
Richmond-Tweed Bal (NSW)	15.8	0.3	12.1	71.8	10.2	0.3	10.5	79.0
Sydney	0.8	0.5	22.0	76.7	0.7	0.2	13.2	85.8
Lower South Coast (NSW)	15.7	0.2	10.1	73.9	9.8	0.2	8.5	81.5
Upper South East (SA)	44.3	0.5	6.0	49.2	36.7	0.2	11.9	51.2
Central Murrumbidgee (NSW)	19.8	0.6	8.6	71.1	13.8	0.2	10.1	75.9
South West (Qld)	36.5	1.7	4.0	57.9	29.4	2.3	4.0	64.3
Lachlan (NSW)	36.3	0.4	6.0	57.2	26.3	2.5	7.9	63.3

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Table B.5 **(Continued)**

Region	1981 Ag	1981 Mining	1981 Mfg	1981 Serv	1996 Ag	1996 Mining	1996 Mfg	1996 Serv
	%	%	%	%	%	%	%	%
Queanbeyan (NSW)	1.3	1.1	12.5	85.1	2.0	0.3	7.8	89.8
Central Murray (NSW)	40.4	0.1	5.4	54.0	31.8	0.0	7.3	60.9
Darling Downs (Qld)	24.2	0.5	10.5	64.9	16.2	0.4	11.2	72.2
Central Macquarie (NSW)	24.8	0.8	6.8	67.6	16.5	1.8	7.7	74.0
Mackay City Part A (Qld)	5.1	0.9	15.2	78.9	3.1	1.9	11.9	83.0
Greater Launceston (Tas)	2.7	0.4	21.3	75.6	2.3	0.4	15.2	82.1
Northern Slopes (NSW)	25.0	1.7	8.2	65.1	17.6	0.8	9.6	72.0
Brisbane	1.1	0.8	17.4	80.7	1.0	0.5	12.4	86.1
Greater Hobart (Tas)	1.6	0.2	13.7	84.5	1.9	0.2	10.3	87.5
Ballarat City (Vic)	3.7	0.3	22.1	73.9	1.9	0.3	16.9	80.8
Sunshine Coast (Qld)	3.6	0.5	9.0	86.9	2.6	0.3	8.5	88.5
Murray-Darling (NSW)	46.4	0.1	2.7	50.7	40.3	0.1	4.6	54.9
Riverland (SA)	33.3	0.1	12.1	54.5	26.6	0.2	11.8	61.5
Central (NT)	5.9	1.6	4.1	88.4	2.7	2.6	3.5	91.2
North Central Plain (NSW)	32.7	0.3	6.9	60.1	27.4	0.1	6.5	66.1
Tweed Heads (NSW)	6.6	0.5	8.5	84.5	2.9	0.3	7.2	89.6
Gold Coast (Qld)	2.1	0.6	9.9	87.3	1.0	0.3	9.6	89.1
Canberra	0.7	0.2	3.8	95.4	0.4	0.1	3.5	96.1
Lower South East (SA)	19.7	0.3	24.2	55.7	14.2	0.4	21.9	63.5
Greater Shepparton/ North Goulburn (Vic)	28.5	0.2	13.8	57.5	20.3	0.1	14.9	64.6
Northern Tablelands (NSW)	22.4	1.8	5.6	70.3	17.7	0.8	5.5	76.0
Adelaide	1.2	0.5	21.9	76.4	1.1	0.3	16.2	82.4
Mildura/Mallee (Vic)	33.5	0.3	5.6	60.5	25.4	0.2	7.5	66.9
Perth	1.9	1.3	15.9	80.9	1.4	1.7	11.4	85.6
Bathurst-Orange (NSW)	7.9	0.4	16.9	74.8	4.8	0.7	15.6	78.9
Lower Murrumbidgee (NSW)	28.8	0.1	11.7	59.4	26.1	0.1	12.4	61.3

a Employment shares were estimated on the basis of data for each region excluding non-classifiable economic units as well as survey respondents that did not state which industry they were employed in — these accounted for 1.4 and 2.1 per cent respectively of total Australian employment in the 1996 *Census of Population and Housing*.

Sources: PC estimates based on ABS (*Integrated Regional Database, Australia 1998*, Cat. no. 1353.0; unpublished 1996 Census of Population and Housing data).

B.4 Variations in regional performance

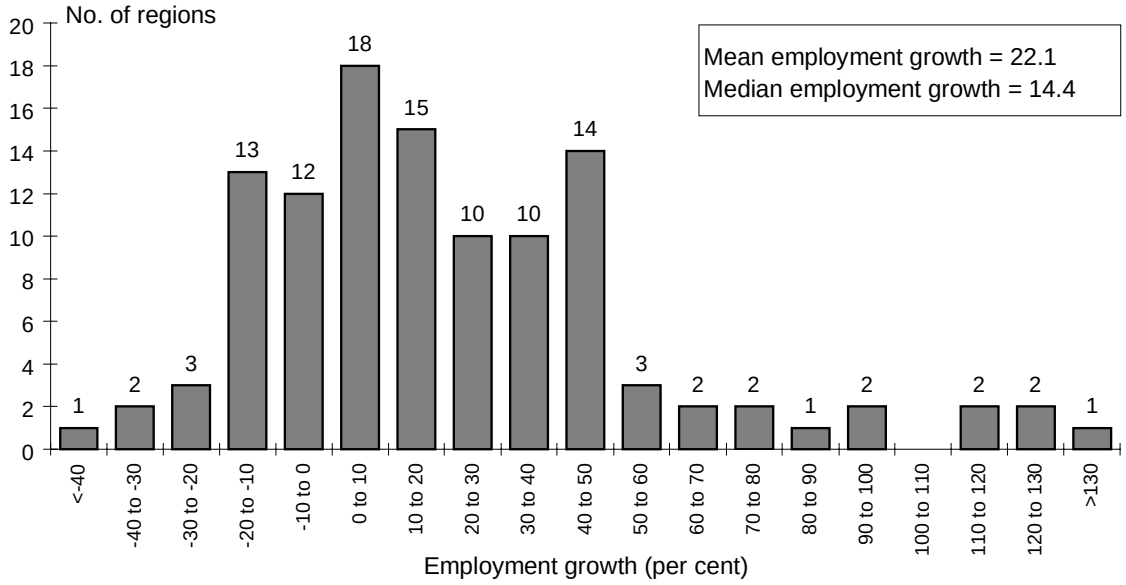
This section presents a summary of variations in the performances of Australia's 113 regions based on changes in employment, unemployment rates and average household incomes for the period 1981 to 1996.

The performance of these 113 regions — measured in terms of employment growth rates — is summarised in figure B.5. Between 1981 and 1996, employment across

these regions increased on average by 22 per cent. In most of the regions that experienced employment growth, increases ranged from 1 to 50 per cent. A further 15 regions had increases ranging from just over 50 per cent to a high of 168 per cent (the North-West region of the Northern Territory). Of the 31 regions experiencing employment declines, most registered reductions of up to 20 per cent. However, 6 recorded more substantial declines — the largest, of almost 60 per cent, was recorded in Tasmania's Lyell region.

More information on the highest and lowest employment growth regions is presented in box B.2.

Figure B.5 **Frequency distribution of regional employment growth rates, 1981 to 1996**



Data sources: PC estimates based on ABS (*Integrated Regional Database, Australia 1998*, Cat. no. 1353.0; unpublished 1996 *Census of Population and Housing data*).

Data on regional unemployment confirm that the increases in the national unemployment rate over the past decade and a half (discussed in chapter 4) have also occurred in most regions of Australia. Only 8 regions experienced declines in their rate of unemployment between 1981 and 1996, and these were mostly remote mining areas. Over the period, the average unemployment rate for all regions increased by 3.3 percentage points.

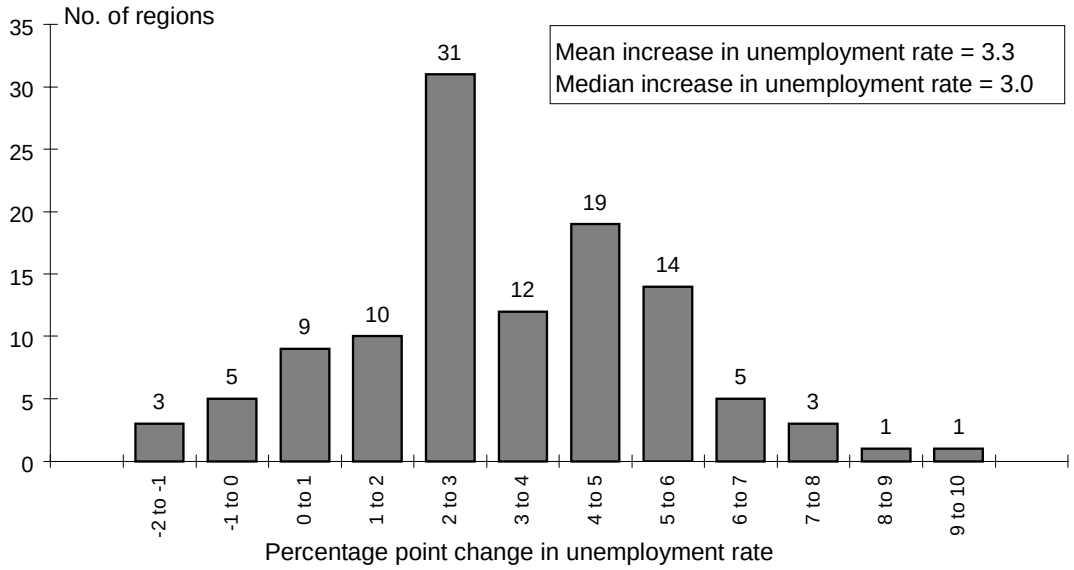
This result differs slightly from the increase in Australia's unemployment rate over the same period reported in chapter 4 and appendix C (2.9 percentage points). In part, this reflects the fact that the above result is an unweighted average of the changes in unemployment rates across all 113 Australian regions. Differences in

methodology between the ABS Census of Population and Housing and the ABS Labour Force Survey have affected the results. An explanation of these differences is contained in ABS (1998b).

However, there was considerable variation in the rates of increase. Most regions (86 of 113) registered increases of between 1 and 6 percentage points (figure B.6). The largest increase was in Queensland's Wide Bay-Burnett region (which includes the towns of Maryborough, Kingaroy and Gympie). Its unemployment rate increased by almost 10 percentage points, taking it from a low unemployment region in 1981 to one of the highest in Australia by 1996 (box B.2). Other regions with particularly large increases included the adjoining Bundaberg region in Queensland, as well as Victoria's Gippsland and South Australia's Flinders Ranges-Pirie regions. These all registered increases in their unemployment rates of around 8 percentage points.

All regions registered increases in nominal average household incomes, with a national average increase of 120 per cent between 1981 and 1996 (figure B.7). More than half recorded increases within 20 percentage points of the national average. In general, incomes increased at a faster rate in metropolitan regions than non-metropolitan regions. Sydney, for example, experienced an increase in average household incomes of over 160 per cent over the period. However, some of the fastest rates of growth were recorded in remote mining regions. Average household incomes in the Lefroy region in the south-east of Western Australia — which

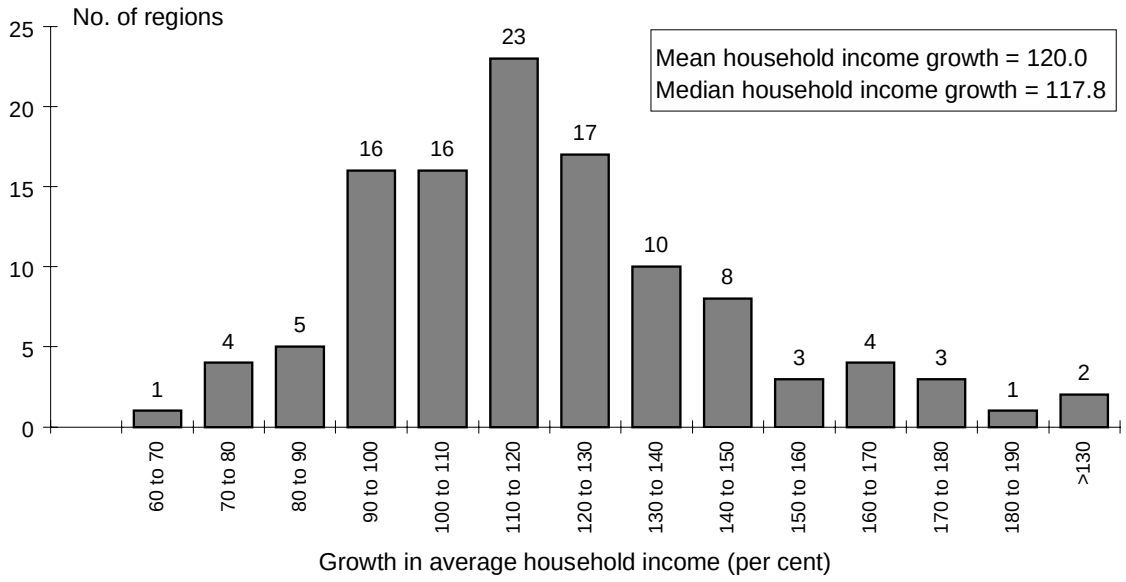
Figure B.6 **Frequency distribution of percentage point change in regional unemployment rates, 1981 to 1996**



Data sources: PC estimates based on ABS (*Integrated Regional Database, Australia 1998*, Cat. no. 1353.0; unpublished 1996 Census of Population and Housing data).

contains Kalgoorlie — for example, increased by an average of 270 per cent in nominal terms (to almost $70 000 in 1996).

Figure B.7 **Frequency distribution of percentage growth in regional average household incomes, 1981 to 1996**



Data sources: PC estimates based on ABS (*Integrated Regional Database, Australia 1998*, Cat. no. 1353.0; unpublished 1996 Census of Population and Housing data).

The variation in growth rates of average household incomes and unemployment rates resulted in changes to the regional rankings between 1981 and 1996. Regional rankings based on average household incomes were relatively stable — with only 18 of the 113 regions changing their rankings by more than 25 places. However, there was much more variation in unemployment rankings. In all, 35 regions changed unemployment rankings by more than 25 places. Details of the top and bottom 10 ranking regions in terms of 1996 unemployment rates and average household income levels are presented in box B.2.

Box B.2 **The best and worst performing regions**

The top and bottom 10 performing regions — as measured by employment growth between 1981 and 1996, unemployment rates in 1996 and average household incomes in 1996 — are listed below.

Australia's top 10 and bottom 10 regions by employment growth, unemployment rates and average household income

Top 10			Bottom 10	
Employment growth 1981—96 (per cent)				
1	North-West (NT)	168.0	Lyell (Tas)	-58.2
2	Dale (WA)	127.7	Far West (NSW)	-31.1
3	Gold Coast (Qld)	125.6	North Wimmera (Vic)	-30.9
4	Sunshine Coast (Qld)	112.2	Whyalla (SA)	-28.1
5	Vasse (WA)	111.1	West Central Highlands	-27.5
6	Cairns City Part A (Qld)	98.3	Flinders Ranges/Pirie (SA)	-21.8
7	Queanbeyan (NSW)	97.6	Hotham/lakes (WA)	-18.8
8	Fitzroy (WA)	80.8	North Eastern (Tas)	-17.1
9	Moreton Balance (Qld)	74.7	Pallinup (WA)	-15.5
10	Lefroy (WA)	70.1	Macquarie-Barwon (NSW)	-11.8
Unemployment rate 1996 (per cent)				
1	Pallinup (WA)	3.9	Clarence (NSW)	17.1
2	Campion (WA)	4.1	Hastings (NSW)	16.2
3	Upper South East (SA)	4.2	Tweed Heads (NSW)	15.9
4	Hotham/lakes (WA)	4.3	Sunshine Coast (Qld)	15.1
5	Ord (WA)	4.6	Wide Bay-Burnett Bal (Qld)	14.9
6	Fortescue (WA)	5.1	Richmond-Tweed (NSW)	14.9
7	Snowy (NSW)	5.3	Bundaberg (Qld)	14.8
8	Lefroy (WA)	5.4	Lower South Coast (NSW)	14.3
9	Arnhem (NT)	5.4	Flinders Ranges/Pirie (SA)	14.1
10	De Grey (WA)	5.6	Whyalla (SA)	13.9
Average household income 1996 ($'000)				
1	Lefroy (WA)	68.7	Yorke (SA)	17.2
2	De Grey (WA)	64.9	North Eastern (Tas)	19.4
3	Snowy (NSW)	58.0	Southern (Tas)	20.0
4	Fortescue (WA)	57.9	Lower South-Coast (NSW)	21.8
5	Arnhem (NT)	54.9	Moore (WA)	22.3
6	Canberra	51.8	Murray Mallee (SA)	22.8
7	Mackay Bal (Qld)	50.7	Macq-Barwon (NSW)	24.0
8	Darwin	49.9	North Loddon (Vic)	24.3
9	Ord (WA)	48.3	Barwon (Vic)	24.7
10	North West (Qld)	48.2	West Cent Highlands (Vic)	24.8

(Continued next page)

Box B.3 **(Continued)**

Some distinctive features of the data are summarised below.

- Queensland and Western Australia dominate the high employment growth regions — accounting for eight of the top ten places. The fastest employment growth was registered in the North-West region of the Northern Territory, which saw its total employment increase by 168 per cent between 1981 and 1996. The next four regions — Dale and Vasse in Western Australia and the Gold Coast and Sunshine Coast in Queensland — more than doubled their employment bases over the period.
- Six of the ten regions with the biggest falls in total employment were in either Tasmania, Victoria or South Australia. Five regions — Lyell in Tasmania, the Far West in New South Wales, North Wimmera and West Central Highlands in Victoria and Whyalla in South Australia all experienced reductions in employment of more than 25 per cent.
- The highest rates of unemployment tend to occur in the coastal areas of NSW and Queensland — with unemployment rates of between 15 and 17 per cent in 1996. In contrast, the notable feature of the ten regions with the lowest unemployment rates in 1996 is the dominance of remote Western Australian resource-based regions — with unemployment rates of between 3.9 and 5.6 per cent (in all they accounted for seven of the ten best performing regions).
- Average household incomes data do not reveal any particularly strong relationship between income levels and employment growth or unemployment rates. However, smaller remote regions in Western Australia such as Lefroy, De Grey and the Ord were represented in the top 10 by household income and lowest unemployment rate. Most of the lowest income regions were remote agricultural-based regions — with average household incomes 30 to 50 per cent below the national average.

Sources: PC estimates based on ABS (*Integrated Regional Database, Australia 1998*, Cat. no. 1353.0; unpublished 1996 Census of Population and Housing data).

B.5 Shift-share analysis

Chapter 3 includes a regional shift-share analysis covering the employment growth experiences of Australia's 113 regions between 1981 and 1996. This section briefly outlines the methodology employed.

If there had been no interregional differences in the growth of Australia's industries between 1981 and 1996, then observed differences in the growth performance of Australia's regions could have been entirely attributed to differences in their industrial structure in 1981. Shift-share analysis allows the calculation of the growth rate that a region would have achieved over this period if each of its industries had grown at the national average rate for that industry. This hypothetical growth rate, denoted by g_R^N, is given by:

$$g_R^N = \sum_i W_i^R g_i^N$$

where w_i^R is the share of industry *i* in region R at the start of the period and g_i^N is the national growth rate of industry *i*.

Industry employment data (2-digit ASIC) were used to estimate each region's hypothetical growth rate for the period 1981 to 1996. These were contrasted with the actual growth rates achieved by each region. The results, plotted in figure 3.6, indicate that although there was a positive correlation, substantial variations between actual and projected employment growth rates of regions were evident.

The fact that regions did not perform exactly as projected by the shift-share analysis is not the result of structural change per se. Indeed, the use of different growth rates for each industry means that the shift-share framework builds in a degree of structural change that varies from region to region depending on initial industry endowments. For example, shift-share based SCI projections for each region in Australia for the period 1981 to 1996 ranged from a low of 11.6 in Canberra to a high of 21.7 in Whyalla (South Australia).

Rather, it is the *differences* between the actual structural change experiences of regions and the projected structural change experiences of regions that explain the variation in the shift-share results. In some regions, the changes in industry composition were similar in rate and form to those projected using shift-share analysis. Whereas, in other regions, the resulting changes were widely divergent from the national trend. This point was emphasised from a slightly different perspective in chapter 3 — namely, between 1981 and 1996 similar industries grew at different rates depending on the region in which they were located.

B.6 Interstate migration

Chapter 3 presented data on interstate migration between 1991 and 1996. It also noted that interstate movements between 1986 and 1991 followed a broadly similar pattern to that observed for the latter period. Data for the earlier period are presented in table B.6.

Table B.13 **Interstate population movements, 1986 to 1991 ('000)**

		This many people left these states ...								
		NSW	*Vic*	*Qld*	*SA*	*WA*	*Tas*	*NT*	*ACT*	**Total arrivals**
	NSW		53.8	56.3	14.3	13.3	5.4	5.5	23.0	**171.7**
... to	Vic	47.6		27.5	17.2	12.9	8.3	4.1	5.8	**123.5**
live	Qld	134.1	59.3		14.3	12.6	6.6	10.9	9.2	**247.1**
in	SA	17.7	17.1	8.3		6.0	2.1	6.6	2.1	**59.9**
these	WA	21.9	18.6	11.6	7.0		3.2	5.3	2.5	**70.1**
states	Tas	8.5	8.3	4.6	2.2	2.5		0.7	0.8	**27.5**
	NT	6.0	5.1	6.9	6.7	4.4	0.7		0.7	**30.5**
	ACT	29.2	6.5	6.6	2.5	2.2	1.1	1.1		**49.3**
	Total departures	**265.0**	**168.7**	**121.9**	**64.1**	**54.1**	**27.4**	**34.3**	**44.2**	**780.1**[a]
	Net migration	-93.3	-45.2	125.2	-4.2	16.0	0.1	-3.8	5.1	
	Per cent change[b]	-1.9	-1.2	5.4	-0.3	1.3	0.03	-2.9	2.2	

a Subtotals do not sum to this total because of movements to/from other territories. **b** Net migration as a share of the initial population.

Source: PC estimates based on ABS (unpublished 1996 Census of Population and Housing data).

C Supplementary labour data

This appendix provides supporting data for chapter 4. Table C.1 shows the number and proportion of workers in full-time and part-time employment in each year since 1970. The rate of unemployment and the average duration of unemployment in Australia are reported in table C.2. The share of total unemployed persons by selected age groups is presented in table C.3 while the rate of unemployment for selected age groups is reported in table C.4. Labour force participation rates are reported in table C.5 (by age) and in table C.6 (by gender). Some indicators of the extent of labour mobility are presented in table C.7.

Table C.1 **Employment status, 1970 to 1998[a]**

Year	*Full-time*		*Part-time*		*Total*
	'000	%	'000	%	'000
1970	4 825.9	89.4	569.7	10.6	5 395.6
1971	4 939.6	89.6	576.1	10.4	5 515.7
1972	4 988.4	88.9	621.4	11.1	5 609.8
1973	5 092.9	88.1	690.1	11.9	5 783.0
1974	5 127.8	87.6	727.4	12.4	5 855.2
1975	5 046.8	86.4	794.5	13.6	5 841.3
1976	5 036.9	85.4	860.9	14.6	5 897.8
1977	5 094.6	85.0	900.9	15.0	5 995.5
1978	5 098.4	84.4	943.6	15.6	6 042.0
1979	5 166.5	84.5	948.8	15.5	6 115.3
1980	5 307.2	84.0	1 013.0	16.0	6 320.2
1981	5 394.8	83.8	1 040.0	16.2	6 434.8
1982	5 343.6	83.2	1 079.3	16.8	6 422.9
1983	5 205.9	82.8	1 080.5	17.2	6 286.4
1984	5 378.0	82.5	1 140.8	17.5	6 518.8
1985	5 525.3	82.1	1 208.7	17.9	6 734.0
1986	5 672.3	81.3	1 308.8	18.7	6 981.1
1987	5 734.6	80.1	1 420.4	19.9	7 155.0
1988	5 941.7	80.1	1 475.5	19.9	7 417.2
1989	6 167.0	79.3	1 613.0	20.7	7 780.0
1990	6 211.8	78.9	1 658.4	21.1	7 870.2
1991	5 971.0	77.7	1 714.8	22.3	7 685.8
1992	5 816.3	75.8	1 855.3	24.2	7 671.6
1993	5 866.2	76.4	1 810.3	23.6	7 676.5
1994	6 031.2	75.9	1 912.7	24.1	7 943.9
1995	6 255.6	75.6	2 023.1	24.4	8 278.7
1996	6 309.1	75.3	2 072.5	24.7	8 381.6
1997	6 249.8	74.6	2 126.1	25.4	8 375.9
1998	6 328.7	74.1	2 207.2	25.9	8 535.9

a August observations.

Source: ABS (*The Labour Force, Australia*, Cat. no. 6203.0).

Table C.2 **Unemployment rate and average duration of unemployment, 1970 to 1998[a]**

	Unemployment rate		
Year	*Original*	*Seasonally adjusted*	*Average duration of unemployment*
	%	%	Weeks
1970	1.4	na	7.4
1971	1.7	na	7.3
1972	2.5	na	6.6
1973	1.8	na	9.7
1974	2.4	na	9.3
1975	4.6	na	6.5
1976	4.7	na	12.7
1977	5.7	na	17.5
1978	6.2	6.5	20.9
1979	5.9	6.1	26.2
1980	5.9	6.2	28.4
1981	5.6	5.8	32.0
1982	6.7	7.0	34.9
1983	9.9	10.2	32.6
1984	8.5	8.8	41.4
1985	7.9	8.2	45.5
1986	8.0	8.3	49.5
1987	7.8	8.1	48.6
1988	6.8	7.1	48.3
1989	5.7	6.0	51.3
1990	7.0	7.2	44.5
1991	9.5	9.8	43.7
1992	10.5	10.9	43.0
1993	10.7	11.1	51.2
1994	9.2	9.5	57.1
1995	8.1	8.3	60.2
1996	8.5	8.7	54.0
1997	8.4	8.7	50.0
1998	7.9	8.1	59.7

a August observations. **na** Not available.

Sources: ABS (*The Labour Force, Australia*, Cat no. 6203.0; *The Labour Force, Australia: Historical Summary*, Cat. no. 6204.0); RBA (1996).

Table C.3 **Share of unemployed persons by selected age groups, 1978 to 1998[a,b]**

Year	*15 to 19*	*20 to 24*	*25 to 34*	*35 to 44*	*45 and over*
	%	%	%	%	%
1978	32.4	21.5	19.8	11.4	14.9
1979	34.7	21.2	20.9	10.6	12.5
1980	33.3	22.5	20.5	10.9	12.8
1981	28.0	23.3	23.2	11.7	13.9
1982	27.4	23.0	23.8	13.1	12.7
1983	24.2	22.8	24.9	14.3	13.7
1984	25.5	22.2	23.2	14.1	15.0
1985	23.6	21.8	24.7	14.3	15.6
1986	24.7	20.2	24.0	15.7	15.5
1987	23.8	20.8	24.8	16.7	13.9
1988	22.7	21.9	23.5	15.5	16.5
1989	23.9	18.6	25.4	16.0	16.0
1990	22.4	21.0	26.8	15.3	14.5
1991	18.8	20.7	25.1	17.8	17.5
1992	19.7	20.7	24.3	17.1	18.2
1993	16.7	20.2	24.8	18.4	19.9
1994	17.4	20.3	23.2	18.5	20.6
1995	19.6	18.0	24.1	19.3	19.0
1996	18.4	17.8	23.6	18.5	21.7
1997	17.4	19.8	23.4	18.7	20.6
1998	18.9	18.7	20.4	20.5	21.6

a Unemployment by age data are unavailable prior to 1978. **b** August observations.

Sources: ABS (*The Labour Force, Australia*, Cat. no. 6203.0; *The Labour Force, Australia: Historical Summary*, Cat. no. 6204.0).

Table C.4 **Unemployment rates for selected age groups, 1978 to 1998[a,b]**

Year	*15 to 19*	*20 to 24*	*25 to 34*	*35 to 44*	*45 to 54*	*55 to 59*	*60 to 64*	*65+*
	%	%	%	%	%	%	%	%
1978	16.8	9.1	4.7	3.6	3.5	3.6	2.7	2.3
1979	17.3	8.2	4.6	3.1	2.9	3.0	2.3	1.2
1980	16.6	8.7	4.6	3.2	3.0	2.5	4.2	0.8
1981	13.9	8.5	4.9	3.1	2.9	3.2	3.9	1.6
1982	16.6	10.2	6.0	4.0	3.6	3.3	3.9	0.9
1983	22.6	14.7	9.2	6.3	5.5	5.8	5.9	2.6
1984	20.9	12.5	7.4	5.3	5.3	4.9	6.6	1.3
1985	18.2	11.5	7.3	4.7	4.7	6.1	6.3	2.3
1986	19.1	11.2	7.1	5.2	5.1	5.5	5.3	1.0
1987	18.7	11.6	7.2	5.3	4.3	5.0	5.3	1.4
1988	15.5	10.9	6.0	4.2	4.2	5.3	7.1	0.8
1989	13.7	7.9	5.4	3.7	3.4	4.0	6.2	1.2
1990	16.5	10.9	7.1	4.2	3.5	4.6	6.7	1.6
1991	21.0	14.6	9.0	6.6	5.9	7.7	9.9	1.1
1992	25.0	16.1	9.8	7.1	6.7	8.0	12.3	1.8
1993	23.0	16.1	10.2	7.8	6.9	10.2	13.4	1.1
1994	20.3	13.9	8.3	6.7	6.4	8.6	8.8	1.0
1995	20.0	11.1	7.7	6.2	4.9	7.8	6.4	1.1
1996	19.5	11.9	8.0	6.2	6.2	8.4	6.3	na
1997	19.3	13.8	7.8	6.2	5.7	8.1	5.3	na
1998	18.8	11.9	7.2	6.2	5.4	6.5	5.3	na

a Unemployment by age data are unavailable prior to 1978. **b** August observations. **na** Not available.

Sources: ABS (*The Labour Force, Australia*, Cat. no. 6203.0; *The Labour Force, Australia: Historical Summary*, Cat. no. 6204.0).

Table C.5 **Labour force participation rates by selected age groups, 1970 to 1998[a]**

Year	*15 to 19*	*20 to 44*	*45 to 54*	*55 and over*
	%	%	%	%
1970	59.1	72.9	69.1	33.4
1971	57.1	73.1	69.5	33.4
1972	57.3	73.3	70.8	33.3
1973	57.7	74.1	70.8	32.4
1974	56.4	74.6	70.4	31.2
1975	58.7	75.0	70.6	30.2
1976	57.5	75.2	71.8	28.8
1977	59.9	76.2	71.2	28.4
1978	59.3	74.8	70.0	26.3
1979	58.3	74.6	69.5	24.8
1980	61.1	75.7	70.0	25.0
1981	59.5	75.4	70.6	24.4
1982	59.3	75.4	70.2	22.5
1983	57.6	75.3	69.9	22.1
1984	57.3	75.9	70.5	22.0
1985	56.9	77.1	70.6	21.4
1986	57.6	78.5	72.7	21.5
1987	55.6	79.2	72.8	21.4
1988	56.2	79.5	72.5	21.5
1989	58.3	80.7	74.3	21.6
1990	57.4	81.3	75.6	22.0
1991	52.9	81.3	76.5	21.4
1992	54.0	80.7	77.0	21.2
1993	51.5	80.5	77.1	20.6
1994	53.8	80.3	76.9	21.1
1995	55.9	81.2	78.4	21.6
1996	57.1	81.0	78.0	22.2
1997	53.2	80.8	76.8	22.2
1998	54.0	80.8	78.2	22.6

a August observations.

Source: ABS (*The Labour Force, Australia*, Cat. no. 6203.0).

Table C.6 **Labour force participation rates by gender, 1970 to 1998[a]**

Year	*All females*	*Married females*	*Males*	*Total persons*
	%	%	%	%
1970	39.6	35.2	83.1	61.2
1971	40.0	36.4	82.5	61.0
1972	40.6	37.5	82.5	61.3
1973	41.4	39.0	82.1	61.6
1974	42.2	40.7	81.0	61.4
1975	43.0	41.1	80.5	61.6
1976	43.0	41.5	80.0	61.3
1977	44.2	42.6	79.8	61.8
1978	43.5	41.7	78.2	60.6
1979	42.9	41.0	77.8	60.1
1980	44.7	42.6	77.8	61.0
1981	44.4	42.2	77.5	60.7
1982	44.0	41.9	76.6	60.0
1983	44.0	41.6	75.9	59.7
1984	44.6	42.8	75.6	59.9
1985	45.7	44.3	75.2	60.2
1986	47.6	47.1	75.1	61.1
1987	48.3	48.6	74.7	61.3
1988	49.3	49.6	74.2	61.6
1989	50.8	51.1	74.9	62.7
1990	51.9	52.8	74.9	63.2
1991	51.6	52.6	74.0	62.6
1992	51.6	53.0	73.7	62.5
1993	51.3	52.8	72.9	61.9
1994	51.8	53.4	72.9	62.2
1995	53.3	55.2	73.3	63.2
1996	53.4	54.6	73.3	63.2
1997	52.7	54.3	72.1	62.2
1998	53.5	55.3	72.1	62.6

a August observations.

Sources: ABS (*The Labour Force, Australia*, Cat. no. 6203.0; *The Labour Force, Australia: Historical Summary*, Cat. no. 6204.0).

Table C.7 **Labour mobility over the past 12 months, 1972 to 1998[a]**

Year	*Share of total employees that changed jobs*	*Share of new job holders that previously held a job*	*Share of new job holders that changed industry*	*Share of workers who involuntarily ceased a job in the past year[b]*
	%	%	%	%
1972	17.4	69.9	32.3	16.2
1973	na	na	na	na
1974	na	na	na	na
1975	na	na	na	na
1976	15.7	68.1	30.3	22.8
1977	na	na	na	na
1978	na	na	na	na
1979	na	na	na	na
1980	13.6	61.2	26.5	22.1
1981	16.2	64.3	27.5	17.1
1982	16.6	67.0	28.2	17.5
1983	14.4	70.2	27.0	29.1
1984	13.7	64.2	24.6	25.2
1985	15.2	66.6	27.6	20.3
1986	16.8	68.5	28.5	16.7
1987	16.6	65.9	25.5	18.6
1988	17.9	68.8	25.0	17.4
1989	19.5	69.9	27.2	15.7
1990	17.5	66.0	27.5	17.3
1991	14.1	65.9	24.8	27.8
1992	12.0	61.2	21.4	29.9
1993	na	na	na	na
1994	13.8	61.6	21.9	24.3
1995	na	na	na	na
1996	15.0	64.0	26.5	19.9
1997	na	na	na	na
1998	13.7	63.0	25.2	20.6

a The 12 months to February of the year shown. **b** Due to lay-off or business closure. **na** Not available — the survey was not conducted for these years.

Source: ABS (*Labour Mobility, Australia*, Cat. no. 6209.0).

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