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# 1 Structural adjustment in a ‘multi-speed’ economy

**Structural change is a pervasive and continuous process. Changes in the structure of an economy, and the adjustments needed to bring them about, are essential to economic development and progress. As an economy grows, its composition is altered, because output and employment growth vary among firms and industries. Some structural trends, such as the relative decline in manufacturing and growth of services, are of long standing, and are common to all developed countries.**

**The recent terms of trade boom, associated mainly with mining exports, has been clearly beneficial for Australia, accounting for a substantial increase in national income and a general rise in household purchasing power. At the same time, it has added to the range of pressures for change facing the economy. However, the adjustment challenges the boom and ensuing currency appreciation have created for some industries and their workforces are not unprecedented. Moreover, improvements in the flexibility and adaptability of the Australian economy due to policy reforms have reduced adjustment costs, relative to past booms.**

Over the past few years, there has been an intensifying debate about the mining boom, structural change and appropriate policy responses. Some key issues in contention are:

- the extent to which the mining boom brings benefits to the wider Australian economy and community
- whether the structural pressures and changes have been unprecedented
- whether these will leave the Australian economy vulnerable in the event of a pronounced terms of trade reversal, and therefore
- whether governments should intervene to reduce or offset the pressures and limit future vulnerability.

Concerns about recent developments are understandable. Structural change involves losers as well as winners. Job shedding and business closures affect many individuals, families and communities. The adjustment pressures created by such

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events can be felt more heavily by segments of society that are relatively less adaptable — for a range of reasons such as age, language background, skills, and marital status.

At the same time, it is important that a focus on the costs of structural change to some does not overlook the benefits of such change to the community as a whole. Though accompanied by capital and labour movements that can give rise to transition costs, structural change ultimately enhances society's welfare, by ensuring that scarce resources are allocated where they can be most productive. For this reason, policy responses that seek to address transitional problems need to avoid compromising the timely adjustments on which rising living standards depend.

## **Sectoral pressures from the mining boom**

While the pressures being felt by some industries have multiple causes (including lower consumer confidence in the aftermath of the Global Financial Crisis and the impact of online competition), the mining boom has been a pervasive driver of change across the economy. It is important to understand how this has been playing out.

As is well known, the rapid industrialisation and urbanisation of China has led to a surge in its demand for raw materials, resulting in a sharp rise in the prices of some of Australia's major commodity exports — mainly coal and iron ore. These price rises marked the beginning of the first phase of the boom (box 1.1). At the same time, China's development, and that of East Asia generally, have reduced the prices of many manufactured goods (electronic goods, machinery) that figure prominently in Australia's imports.

The net result has been a rise in Australia's terms of trade on a scale not witnessed since the Korean War boom, driven at the time by the price of wool (figure 1.1). (While currently waning, the terms of trade remain well above the historical average.) Unlike that earlier, short-lived boom, this one has now lasted almost ten years,<sup>1</sup> has linkages with many non-mining industries and has extended across many regions.

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<sup>1</sup> There is no consensus regarding the start of the boom. Most analysts, however, place it around 2002-03, when the terms of trade began to rise above their twentieth-century average.

### Box 1.1 The three phases of the mining boom

The mining boom has its origins in an escalation of export demand from China. It is widely accepted that the boom has three distinct phases:

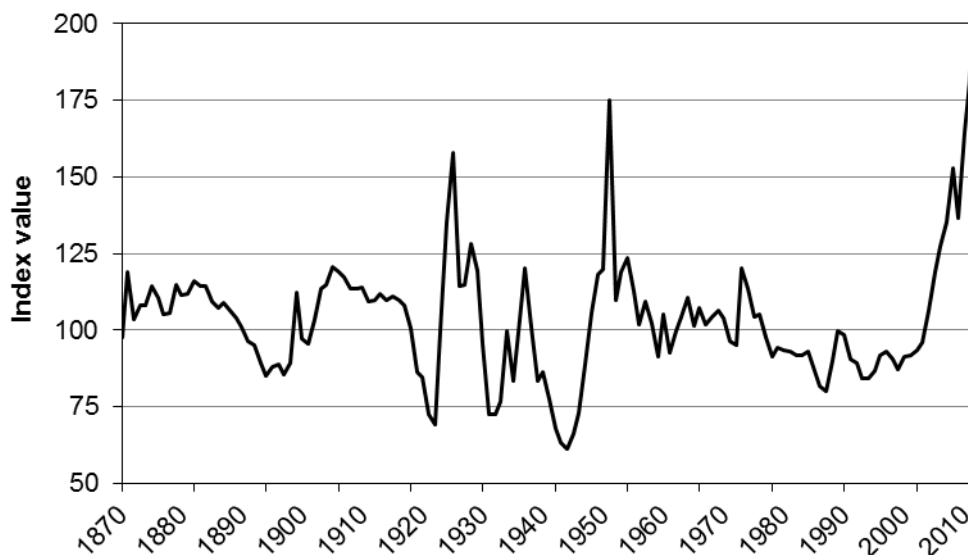
- Phase I: the rapid increase in commodity prices, and hence the terms of trade, as demand exceeds supply, and the subsequent appreciation of the exchange rate
- Phase II: the sharp rise in mining investment to increase supply
- Phase III: increased volume of mining production and exports.

These phases are consecutive, though overlapping. The first phase is now waning. The second phase is well underway. However, the peak in investment is predicted for 2013-14, and may end up being lower than expected, as some projects 'on the books' get reassessed. The third phase is only just beginning in earnest, with resource exports estimated to at least double in volume between 2010-11 and 2020-21.

For a detailed theoretical and empirical treatment of the successive phases of the mining boom, refer to the publications below.

Sources: Plumb, Kent and Bishop (2012); Sheehan and Gregory (2012); Stevens (2012a).

Figure 1.1 Terms of trade reached an all-time peak in 2011<sup>a</sup>  
Index values, 1870–2012, year ended June (1901–2000 average = 100)



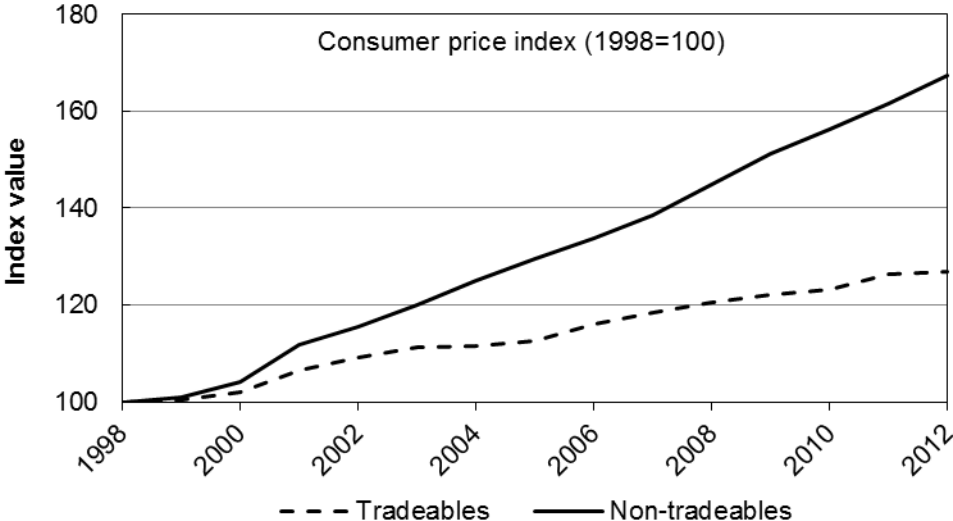
<sup>a</sup> Based on annual data to 1959, and quarterly data thereafter (dates refer to the June quarter, except the figure for 2012, which refers to the March 2012 quarter).

Data sources: RBA (data supplied on request); RBA (2012), *Terms of Trade*.

The additional national income generated by the higher terms of trade has been estimated at 15 per cent or more of Gross Domestic Product (Stevens 2011). It stimulated demand for goods and particularly services. Because many services are not traded internationally, and with the economy at close to full employment, growth in non-traded activities has been accommodated through the relative contraction of other parts of the economy. This has primarily affected exporting ‘non-booming’ industries (traditional exporters, but also providers of inbound tourism services) and import-competing industries.

These sectoral shifts result from the ‘real’ appreciation of our currency, which has seen the prices of domestically-produced, non-traded products rise faster than those of tradeable products (figure 1.2). However, because domestic production of the latter incorporates many non-traded inputs, Australian traded goods have become more expensive, reducing demand for them both at home and abroad.

**Figure 1.2 The relative price of ‘non-tradeables’ has risen<sup>a</sup>**



<sup>a</sup> Year ended June, annual averages of quarterly data.

Data source: ABS (2012d).

This adjustment process is often referred to as the ‘Dutch Disease’, a term coined in the 1970s to characterise similar pressures in the Netherlands economy following the discovery and exploitation of North Sea gas reserves. A ‘disease’ suggests harmful effects, but this was not the long-term experience of the Netherlands and nor should it be for Australia. A better description is ‘multi-speed’ economy, which more accurately conveys that the various parts of an economy rarely move in unison. Leading and lagging sectors have always been a reality in Australia, and recent developments are, in many cases, merely an accentuation of longer-term trends.

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## Recent changes in perspective

### **The rate of structural change is not unprecedented**

The importance of particular industries in the economy typically changes over time, in response to a range of influences affecting supply and demand in those industries (box 1.2). Some effects are gradual, such as those arising from demographic change, while others are much more rapid, such as when significant technological advances take place.

To illustrate how a single technological breakthrough can have a transformational impact on a range of industries, consider how the worldwide web and electronic commerce have revolutionised the market for books. Thirty years ago, the selection and purchase of a new-release overseas novel by Australians would typically have involved: reading a book review on newsprint; waiting for up to thirty days after the release of the overseas edition; withdrawing cash via a (non-automatic) bank teller, during banking hours on a weekday; and visiting the local bookstore, during business hours. Today, web-based instruments such as Google, Amazon, PayPal and iTunes have compressed and simplified this process greatly, with consequences for industries such as book and newspaper publishing and printing, traditional banking and ‘bricks and mortar’ retail.

In addition to technological ‘shocks’, the Australian economy has experienced a number of external trade shocks throughout its history, including a series of booms in export commodities. Both domestic and external pressures for change have tended to set in train economic adjustments resulting in changes in the composition of output and employment.

The extent of these changes over the course of the past four decades can be illustrated by employing a synthetic measure of structural change called a ‘Structural Change Index’. This commonly-used indicator measures the rate at which sectoral (or state and territory) shares of employment (or output or investment) are changing over time (figure 1.3). For example, in the third panel of figure 1.3, the employment index reflects the percentage of jobs that have notionally relocated between sectors over time. The higher the index, the larger the proportion of total jobs that has ‘changed’ sectors. (Jobs do not have to be lost in one sector and gained in another for the index to be above zero. If different sectors create net jobs at different rates, the index will show this as structural change.)

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### Box 1.2 Drivers of structural change

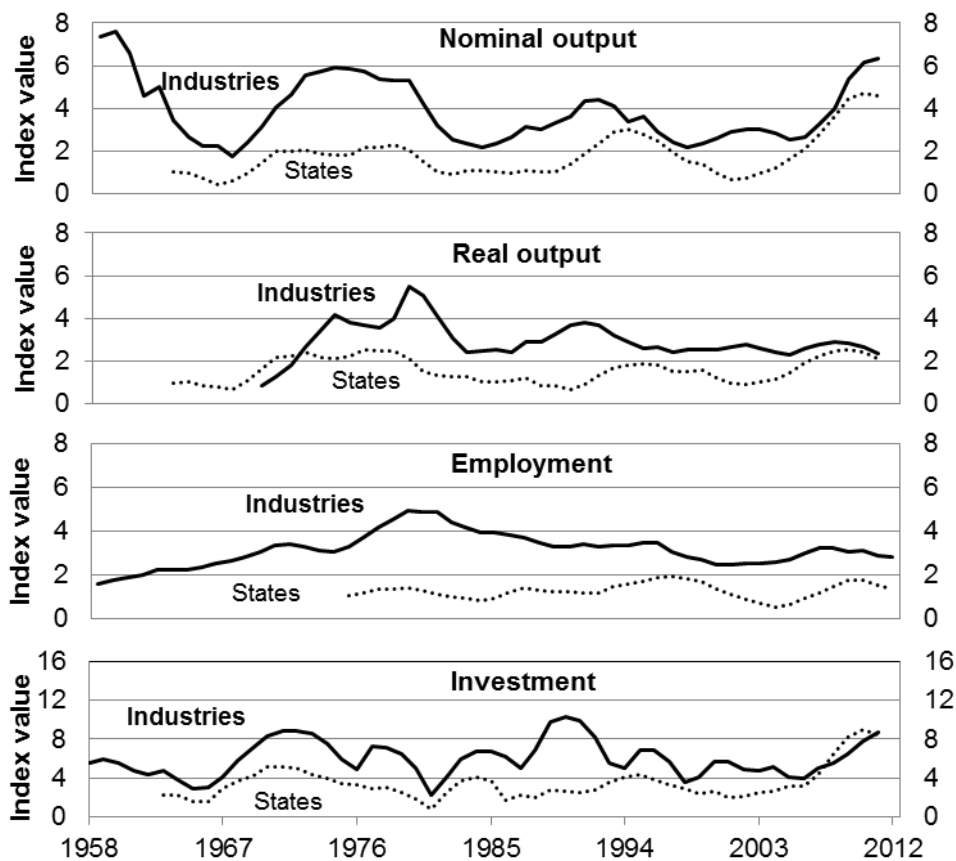
The forces exerting pressure for structural change are diverse. They arise on both the supply and the demand sides of markets. The key drivers of structural change in developed countries include:

- Technological change — for example, the Information and Communication Technology revolution has affected most economies, with profound consequences for production and distribution processes, as well as the consumption patterns, in industries such as banking, communication and retail.
- Consumer behaviour — consumption and saving decisions by households are capable of influencing the fortunes of whole industries and occupations. A case in point is the early 2000s turnaround in the Australian household saving rate, following decades-long decline. This change in behaviour and the subsequent deleveraging that followed the Global Financial Crisis — regarded as permanent by some (Stevens 2012b) — has had adverse implications for such industries as financial, retail and real estate services.
- Demography — the gradual move into retirement of the ‘baby boomer’ cohort is projected to add considerably to the demand for aged and health care services. Demand for these services was already on an upward trajectory due to consumers’ propensity to spend an increasing proportion of rising incomes on these services.
- Global shocks and transformations — as already mentioned in this chapter, recurring trade booms and busts can have ramifications for Australian producers in general, and exporters and importers in particular. Even without such abrupt shocks, the development process in emerging-market economies, marked by urbanisation and industrialisation, has the capacity to alter demand and supply conditions for Australian output.
- Natural resources discoveries — the discovery of commodities such as minerals or oil has, at times, significantly modified the industrial landscape, through the relative price effects and factor movements that such discoveries can trigger. These effects are encapsulated in the related ‘Gregory thesis’, ‘Dutch Disease’ and ‘resource curse’ constructs.
- Government policy — reforms undertaken by governments have the capacity to create pressures for change within and between industries. Certain industries may be the direct target of policy initiatives or reform, or may be indirectly affected by policy changes to aspects of their regulatory or commercial environment. In Australia, there have been examples of both types of change-inducing reform, reversing earlier policy stances, such as the deregulation of the dairy industry and across-the-board tariff cuts, respectively.

Source: PC (2012c).

The indexes included in figure 1.3 — which update those provided in Connolly and Orsmond (2011) — reveal that there have been several periods of rapid structural change at the industry level since the late 1950s. While the change in nominal output and investment has been rapid in the last decade, this has not been unprecedented. Moreover, recent industry-level changes in real output and employment shares have remained below the peaks recorded in the 1970s.

Figure 1.3 **Structural change indexes<sup>a</sup> reveal precedents**



<sup>a</sup> Calculated as half the sum of the (absolute) five-year change in the five-year moving average of industry or State shares, with the final year indicated. See Connolly and Lewis (2010), footnote 8, for industry and state and territory aggregations, and for variable definitions.

Data sources: ABS (2012a, 2012b, 2011a); Connolly and Orsmond (2011); Connolly (2012), pers. comm. (data for years prior to available ABS data).

At the state and territory level, index values reveal the size and geographic concentration of the mining boom of the past decade. Real output and employment have been high, but broadly in line with earlier periods. The nominal output and investment indexes, on the other hand, are at their highest since at least the late 1950s, reflecting the effect of high commodity prices on the output of selected states, and the magnitude of the associated mining investment effort in those jurisdictions. This effort underpins the second, ‘construction phase’ of the boom which, unlike the first ‘price phase’, has yet to reach its peak (Sheehan and

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Gregory 2012). The large investment pipeline currently projected for the resources sector should, therefore, continue to foster structural change in investment.<sup>2</sup> This investment phase will be followed by a third, ‘production’ phase, during which additional mining productive capacity will come on stream, and raise the pace of structural change in real output.

### **Unemployment and inflation have remained low throughout this mining boom**

As mentioned, Australia has experienced many commodities booms throughout its history. However, the current mining boom has taken place in very different domestic circumstances to earlier booms, both institutionally and economically. The outcomes have differed significantly, as a result. For example, Gruen (2011) contrasted the current boom with the one that began in 1971-72 with a rise in the price of rural commodities. He found that inflation, wages and unemployment remained subdued during the latest boom, in contrast to the sharp rises recorded during the earlier episode, even allowing for one-off factors. Figure 1.4 traces out the time path of these indicators separately throughout the 1970s and the 2000s (beginning a year or so before rising commodity prices signalled the beginning of each boom).

The contrast between the outcomes from the two booms is the more noteworthy because this terms of trade boom has been much larger and more enduring than its predecessor.<sup>3</sup> That it has been accompanied by far less economic turmoil is a matter of continuing interest for policy makers and researchers.

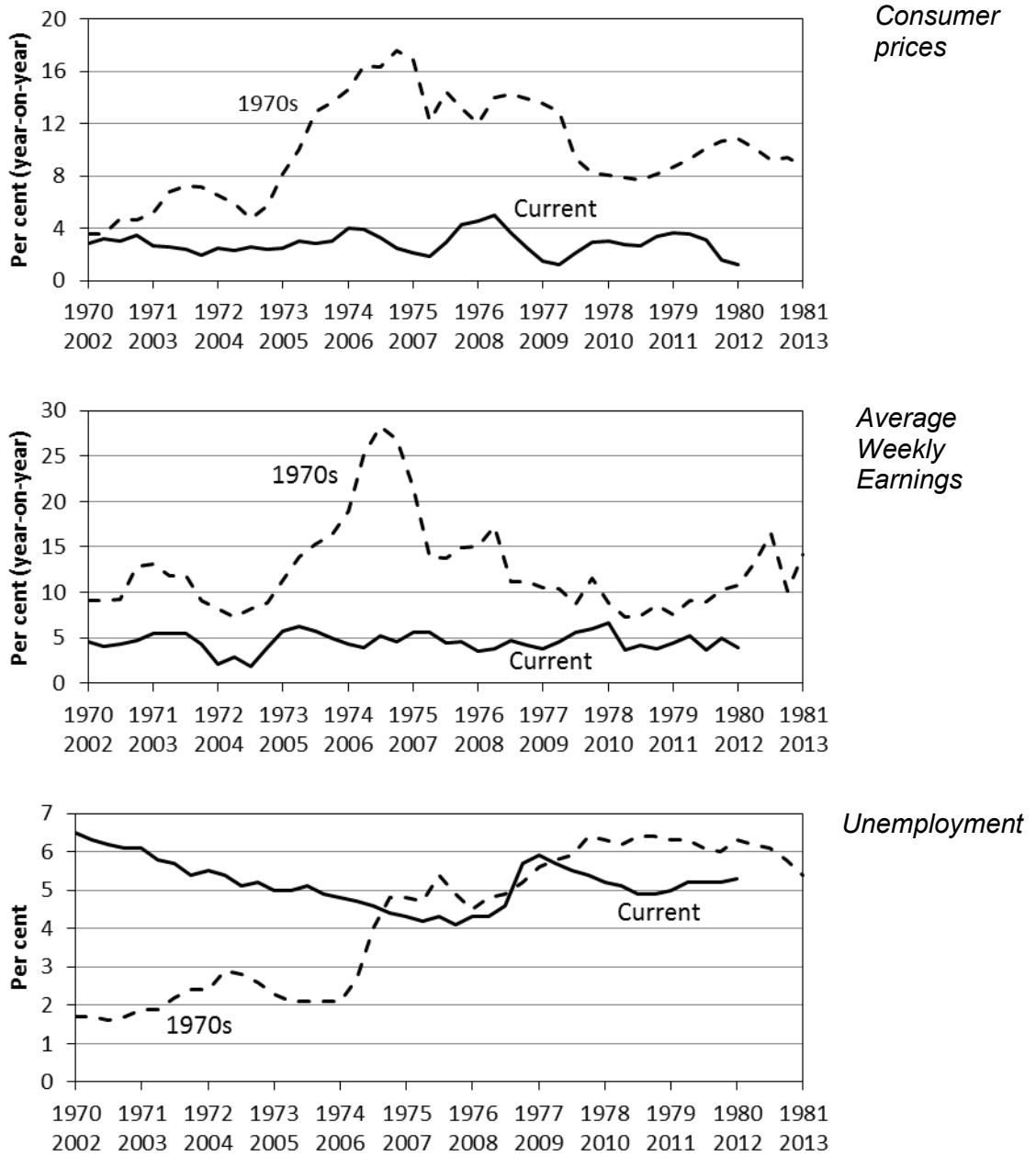
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<sup>2</sup> At April 2012, a total \$260 billion of capital expenditure in the resources sector was ‘under construction’ or ‘committed’, according to the Bureau of Resources and Energy Economics (BREE 2012). Projects described as ‘less advanced’ (for example, awaiting approval) amounted to potential additional total expenditure of \$243 billion. The next update from the BREE, due in November 2012, is likely to reveal a reduction in the mining investment pipeline, due to decreases in the export price of a number of resources since September 2012.

<sup>3</sup> While the 1971-72 rural commodities boom was followed by other booms in the 1970s, most notably the trebling of the price of coal exports between 1974 and 1976 that followed the oil price shocks, these subsequent booms were not accompanied by a rise in Australia’s terms of trade.



**Figure 1.4 A tale of two booms: inflation, wages and unemployment<sup>a</sup>**  
 Annual CPI and wages growth, and unemployment during the 1970s and current booms



<sup>a</sup> See Gruen (2011) for details of time-series construction. Time series begin at June 1970 (1970s boom) and = June 2002 (current boom). These dates are chosen to begin a year or so *before* commodity prices started to increase.

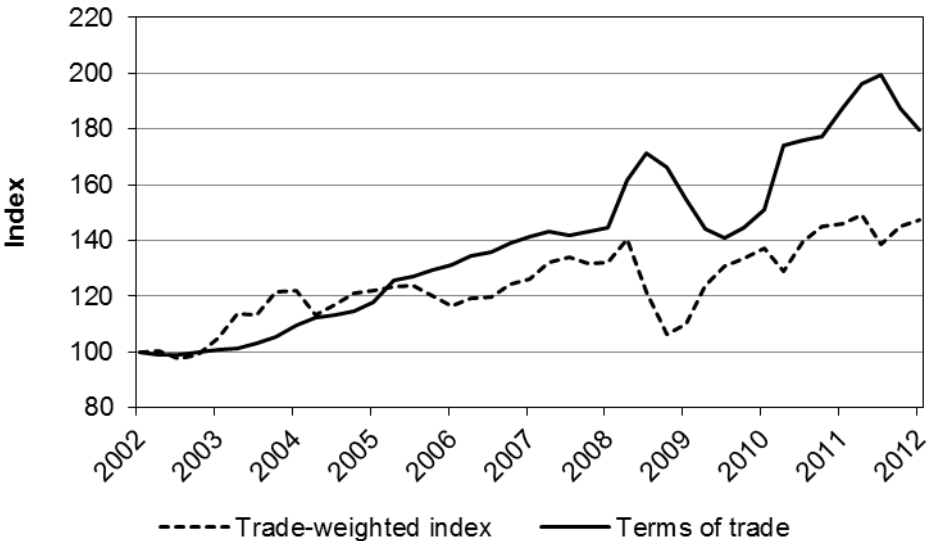
*Data sources:* Adapted from Gruen (2011), using ABS (2012c, 2012d, 2012e).

The more benign macroeconomic outcomes accompanying this recent boom may, in part, be a reflection of the ‘great moderation’ — a decline in the volatility of output, employment and inflation in most advanced economies, lasting from the early 1980s until recent global downturns. Explanations for the ‘great moderation’ include improved monetary policy, increased global integration, and better inventory control methods. Structural change favouring the (more stable) production of services is also thought to have played a role, at least for some countries (Davis and Kahn 2008), as have reforms to enhance the flexibility of product and labour markets (Kent et al. 2005). Reforms of this nature — such as the move away from centralised wage-fixing to enterprise-level bargaining in Australia — have facilitated the reallocation of factors and resources in response to sector- and firm-specific shocks, thus reducing overall instability. Notwithstanding the advent of the Global Financial Crisis and subsequent international economic turmoil, Australia has continued to reap the benefits of these reforms.

**Assisted by a floating exchange rate**

A key difference, in Australia’s case, is that the recent boom has been the first to occur under a floating exchange rate. The value of the \$A relative to the basket of currencies in the Trade-Weighted Index has generally mirrored the rise in Australia’s terms of trade (figure 1.5).

**Figure 1.5 A ‘commodity currency’: the rising dollar and the terms of trade<sup>a</sup>**



<sup>a</sup> Terms of trade: seasonally adjusted quarterly data. Trade-Weighted Index: end of quarter data. Both indexes have been rebased to March 2002.

Data sources: ABS (2012f, 2012g).

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The flexibility of the Australian dollar has served to insulate the macroeconomy from the possible downsides of recent external shocks. For example, the exchange rate acted as a ‘shock absorber’ during the Global Financial Crisis. Conversely, when the terms of trade increased, and national income expanded, the exchange rate was instrumental in spreading the benefits of the boom. This allowed consumers and producers to enjoy cheaper prices for imported goods, services and inputs, which limited the inflationary impact of the extra household income. In addition, as illustrated in figure 1.2, the increase in the \$A brought about changes in the relative prices of traded and non-traded products, prompting production shifts. Those shifts, in turn, eased pressures on domestic prices.

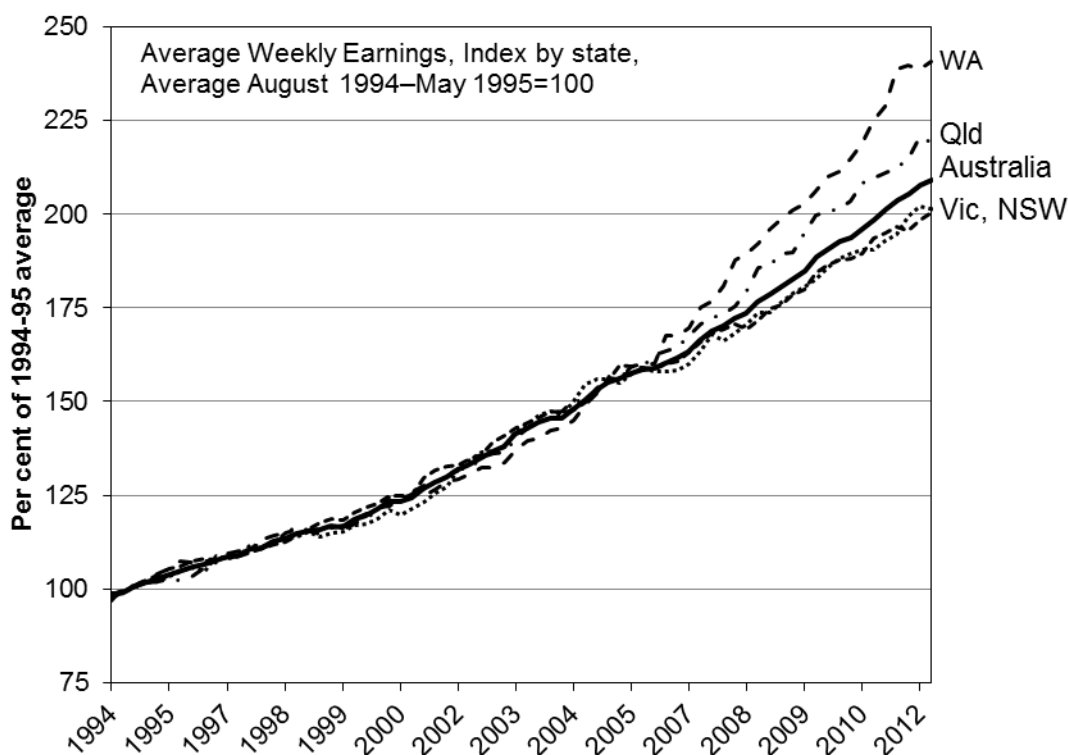
By the same token, the floating dollar could be expected to cushion the economy on the ‘way down’ if the terms of trade continue to unwind. (They are currently around 10 per cent below their peak of September 2011.) This would, in turn, favour trade-exposed industries. The importance of a floating exchange rate was underscored during the 1997–98 Asian Financial Crisis, when exposure to East Asia led to a significant decline in Australia’s terms of trade. As a result of the ensuing depreciation in the Australian dollar, Australia’s exports were able to be re-directed towards Europe and North America (Anderson 2000).

### **Labour market adjustments have been taking place relatively smoothly**

When Australia’s terms of trade last peaked in 1973-74, demand pressures translated into high nominal wages, with rising inflation and unemployment to follow (figure 1.4). The large real wage ‘overhang’ from the disparity between average nominal wages and labour productivity took several years to unwind.

Decentralised wage-setting in more recent years has made it possible for relative wages to change across jurisdictions, industries and firms in response to differential labour market pressures (figure 1.6). Further, as seen in figure 1.4, decentralised wage-setting has avoided demand pressures being transmitted from expanding parts of the economy into aggregate nominal wage outcomes.

Figure 1.6 Wage movements have reflected local conditions<sup>a</sup>



<sup>a</sup> Productivity Commission calculations using full-time adult total earnings, seasonally adjusted series.

Data source: ABS (2012e).

Additional benefits have been fewer job losses from cyclical fluctuations and structural shocks than in the past, as hours worked have been a preferred source of adjustment, limiting the number of layoffs. Moreover, displaced workers have tended to spend less time unemployed than they used to, including in jurisdictions where there is little or no mining activity. For example, average unemployment duration decreased in all jurisdictions apart from the Northern Territory between 2001–03 and 2010–12 (table 1.1).

This is also true for a particular demographic group that is traditionally vulnerable to lengthy unemployment spells. The average unemployment duration for males aged 55 years and over was around 72 weeks in 2010–2012, down from 111 weeks in 2001–03. A note of caution is injected by Gregory (2012), who observes that, in the 2000s, older, unemployed unskilled males have continued the previous trend of moving from long-term unemployment to the disability support pension. He also notes that the mining boom does not appear to have durably altered the long-term decline in the full-time employment-to-population ratio for males aged 15–64, even in the mining states of Western Australia and Queensland.

**Table 1.1 Average unemployment duration has fallen<sup>a</sup>**

<i>State or Territory</i>	<i>Average duration 2001–03</i>	<i>Average duration 2010–12</i>
	Weeks	Weeks
New South Wales	53.6	43.8
Victoria	44.0	35.2
Queensland	42.4	30.9
South Australia	60.0	44.2
Western Australia	37.9	26.8
Tasmania	77.6	44.8
Northern Territory	23.7	28.0
Australian Capital Territory	36.7	25.2
Australia <sup>b</sup>	48.0	36.9

<sup>a</sup> Each column contains duration data on the two years to August. Note that *average* duration is considerably longer than *median* duration, due to the weight of the long-term unemployed in the former indicator.

<sup>b</sup> Average duration for Australia calculated by summing state components.

Source: ABS (2012a).

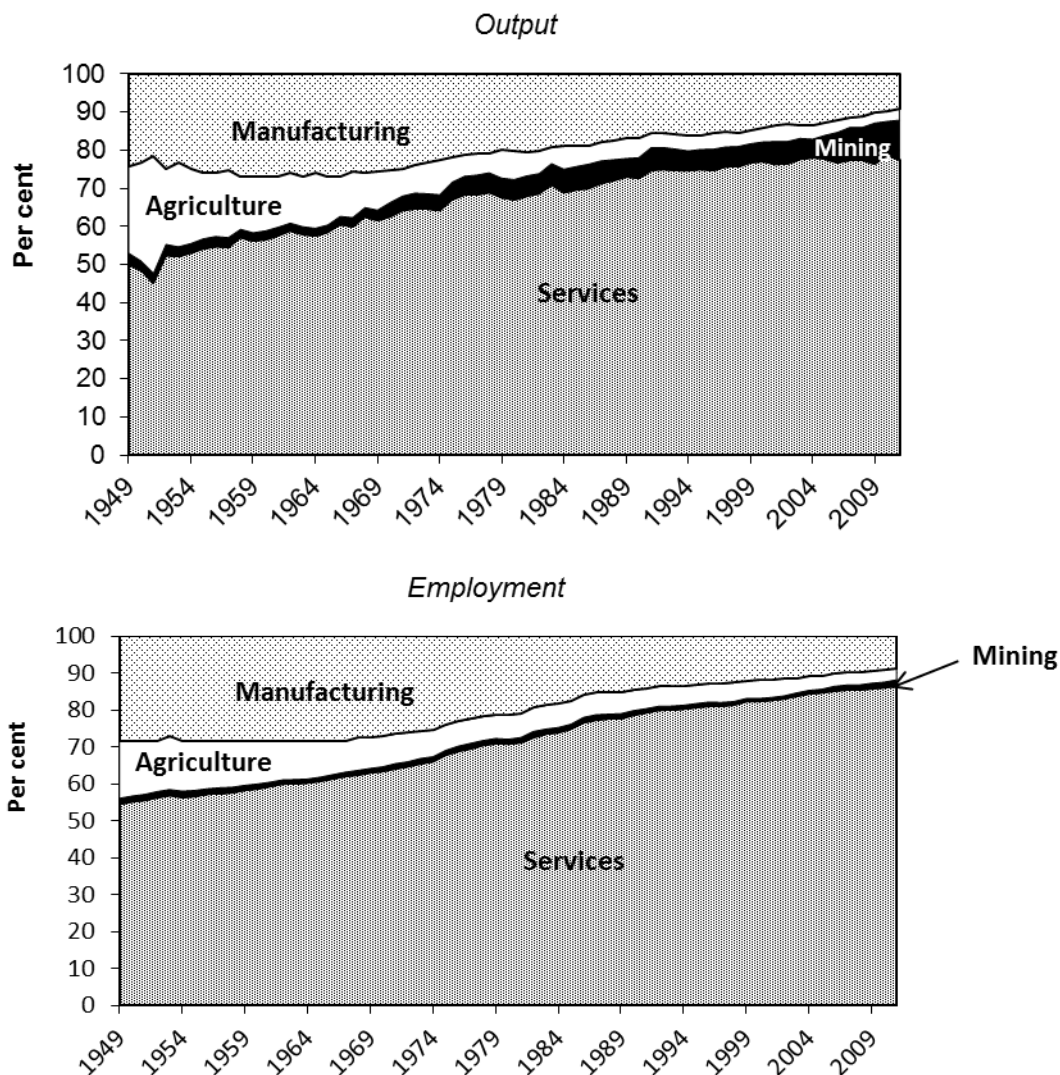
Nonetheless, older males are now remaining in the labour market for longer, on average, than they used to, including by working part-time. Borland partly attributes the significant increase in the labour force participation rate of males aged 55 and over, during the 2000s (following a long decline), to the ‘growth in services jobs which are less physically demanding’ (2011, p. 179).

## **A closer look at sectoral changes**

As in previous decades, sectoral shares of value added and employment have changed over the last ten years. In the case of agriculture and manufacturing, these changes have reinforced long-standing trends (figure 1.7). Mining, by contrast, increased its share of both output and employment. Finally, while services continued to increase their share of employment, their weight in nominal output terms appears have been plateauing in the last ten years or so. This trend is an artefact of the growth in the share of mining output, and of the way in which the output of some services is measured.<sup>4</sup>

<sup>4</sup> National accounts value the output of ‘non-market sector’ services (education and training; public administration and safety; and health care and social assistance) at cost. Given the weight of wages and salaries in those activities’ costs, the slow growth of Average Weekly Earnings over the last decade (figure 1.4) would have inhibited growth in their measured output.

**Figure 1.7 Secular trends in sectoral shares since WWII**  
 Gross value added and employment by broad industry, year ended June<sup>a</sup>



<sup>a</sup> Current price data used for gross value added, due to data availability.

Data sources: ABS (2012a, 2012b); Connolly (2012), pers. comm. (data for years prior to available ABS data); Withers, Endres and Perry (1985).

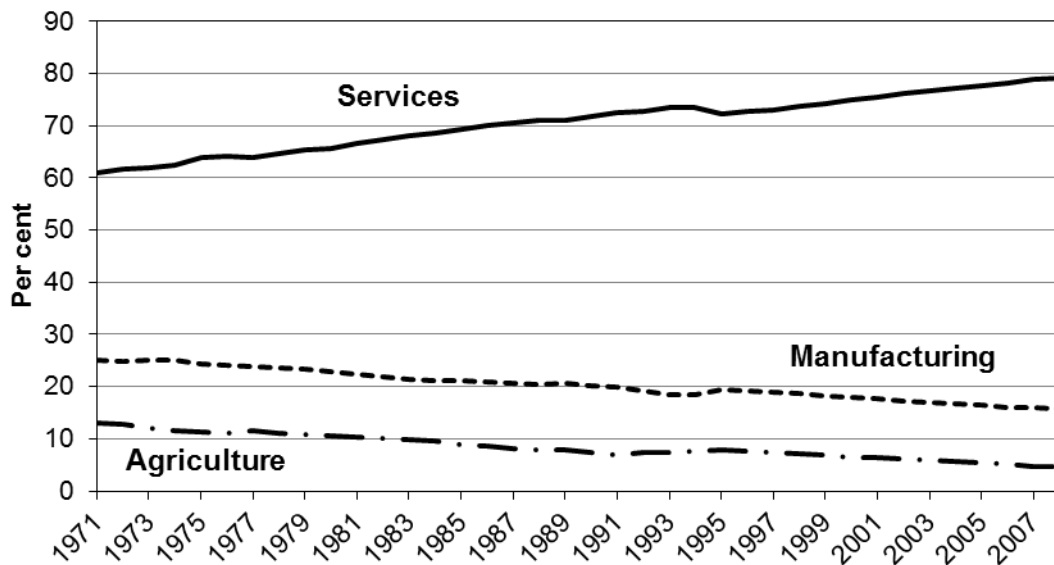
The value-added share of mining is now approximately back to where it was at the turn of the twentieth century. However, mining's share of total employment is much smaller than it was then, because of the much greater capital intensity of production. Nevertheless, between 2002-03 and 2011-12, mining added 160 000 workers, more than doubling the size of its workforce (an annual growth rate of 12 per cent). In WA alone, mining added 65 000 workers over that period, amounting to almost a quarter of all employment growth in that jurisdiction.

The employment gains of the mining sector outweighed the 117 000 reduction in manufacturing employment over the same period. However, only a small proportion of the additional mining employees appear to have previously worked in domestic manufacturing. More significantly, employment changes in both sectors have been swamped by the 2 million jobs created in the services sector since 2002, with that sector now accounting for nearly nine jobs in ten.

## Continuing growth in services

Mining aside, the long-term pattern of structural change at the sectoral level in Australia — a growing services share and declining agriculture and manufacturing shares — is replicated in most other advanced economies (figure 1.8). This phenomenon has had several causes, some of which are more relevant to Australia:

Figure 1.8 **Sectoral shares of employment in the OECD<sup>a</sup>**



<sup>a</sup> Productivity Commission calculations of yearly OECD average. New entrants to the OECD in 1993–1997 affected calculation of the mean shares.

Data source: OECD (2010), *STAN Database for Structural Analysis*.

- As mentioned in box 1.2, it is widely observed that, as incomes have grown in developed countries, the proportion of consumption devoted to services has tended to rise. This is particularly apparent of expenditure on so-called ‘superior goods’, such as health, education, recreational and financial services.
  - Rapid increases in health spending are even more evident in countries where population ageing is occurring, and where it is accompanied by the rapid adoption of advanced medical technologies.

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- Outsourcing has also made a difference to the classification of activities. Some that were previously carried out in-house by manufacturers, such as accounting, computing and cleaning, have been progressively contracted out to external providers and are now classified as part of the services sector. Similarly, with rising female labour force participation, many services that had been provided as unpaid work from within the family or household, such as childcare and property maintenance, are being outsourced. Again, this results in increased market services employment.
    - For example, it is estimated that the number of young children attending either Long Day Care or Outside School Hours Care increased from around 390 000 in 1996-97 to about 755 000 in 2010. This rapid growth rate was mirrored by the number of workers providing early childhood education and care services, which almost doubled over the same period (PC 2011h).
  - With China and East Asia increasingly specialising in the provision of low-cost manufactured goods, Australia and others have moved to exploit their comparative advantage in ‘knowledge-intensive’ activities, most of which are in services.
  - Competition reforms also played a key role in Australia, including through the reduction in previously high levels of protection afforded to manufacturing and the removal or loosening of regulatory constraints on firm performance. These reforms enabled consumers to enjoy lower-priced imported goods (clothing, cars, household appliances), but also domestic services (real estate, finance). Competition reforms also saw reform to government enterprises, for example, in rail transport and utilities. This led to efficiency gains, at least initially, which saw output of these services expand, despite workforce reductions.

Given its size, the heterogeneity of the services sector is to be expected. It comprises a multitude of activities, which are more or less closely related and can be difficult to categorise (box 1.3).

The diversity of the services sector is also apparent in the differential growth of its constituent activities. Figure 1.9 charts employment in aggregated services industries from 1985 to 2012. The growth of social services and business services employment from the beginning of the 2000s stands out, as does the rise in construction employment, linked in part to the mining boom. These trends are an indication that structural change is also occurring *within* the services sector, in response to the various pressures mentioned previously (box 1.2).



### Box 1.3 The services sector: a study in diversity

The services sector may be defined by what it is not: agriculture, mining, or manufacturing. In this sense, it is the *residual* sector. A more informative definition relates to some common features that set services apart from other forms of economic activity, namely their: (i) intangible or immaterial nature; (ii) non-storability and non-transferability; and (iii) provision through the direct interaction of the producer and the consumer.

There are, however, services that do not possess all of these features (for example, a restaurant meal is clearly tangible, storable and transferable). Moreover, there can be some overlap between sectors (for example, between the activities of an automobile manufacturing plant and those of a car servicing garage).

The diversity of the services sector is reflected in the large number of industry divisions it comprises, as well as in the relative sizes of these (table 1.2).

**Table 1.2 Service industries shares of sectoral value added and employment<sup>a</sup>**  
Average, 2011-12

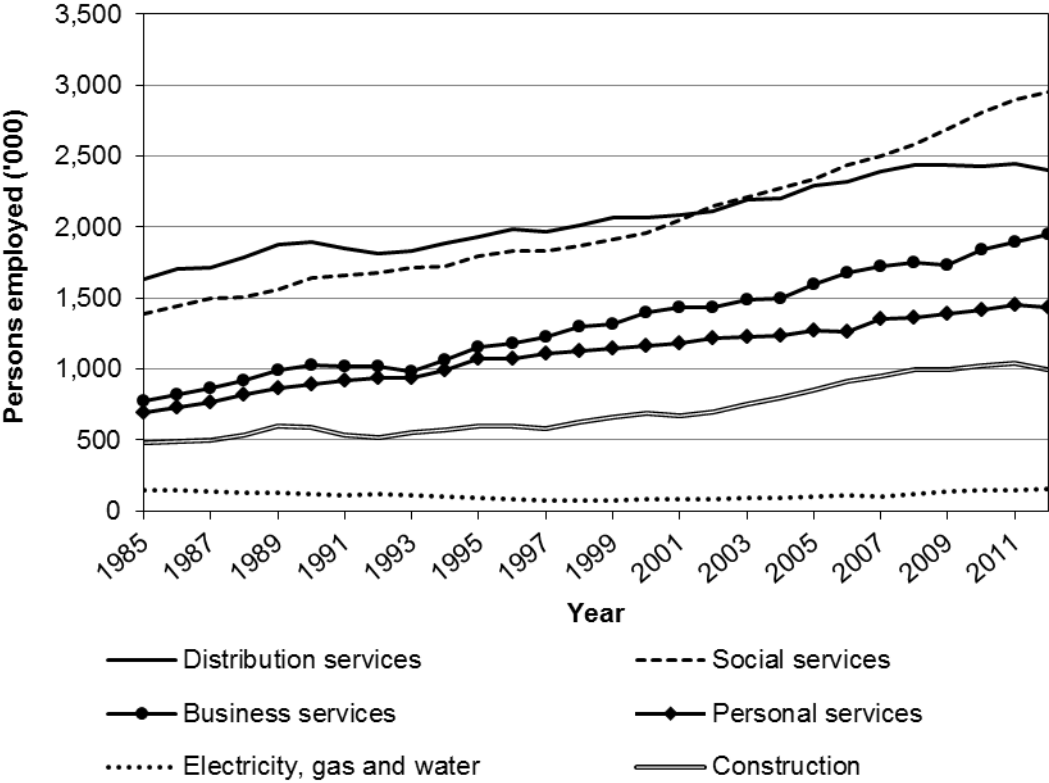
<i>Industry divisions and groupings</i>	<i>Value added<sup>b</sup></i>	<i>Employment<sup>c</sup></i>
	%	%
Electricity, gas, water and waste services	3.1	1.6
Construction	11.5	10.3
<b>Distribution services</b>		
Wholesale trade	6.3	4.2
Retail trade	6.5	12.3
Transport, postal and warehousing	7.6	5.7
Information media and telecommunications	4.6	2.2
<b>Business services</b>		
Financial and insurance services	14.4	4.3
Rental, hiring and real estate services	3.0	2.1
Professional, scientific and technical services	9.8	9.0
Administrative and support services	3.4	4.1
<b>Social services</b>		
Public administration and safety	7.3	7.4
Education and training	6.5	8.8
Health care and social assistance	8.8	13.6
<b>Personal services</b>		
Accommodation and food services	3.3	7.7
Arts and recreation services	1.2	2.1
Other services	2.5	4.6
<b>Total services sector</b>	<b>100.0</b>	<b>100.0</b>

<sup>a</sup> Row headings in bold characters refer to industry groupings based on the primary economic function of industries. <sup>b</sup> Value added = gross value added in chain volume terms (reference year 2009-10), quarterly data, seasonally adjusted. Excludes ownership of dwellings. <sup>c</sup> Employment = total persons employed, quarterly data.

Sources: McLachlan, Clark and Monday (2002); ABS (2012a, 2012g).

The changing employment balance of industries within the services sector is increasing the overall skill intensity of that sector. In those service industry groupings that have grown the fastest over the last ten years (figure 1.9), a majority of workers is employed in relatively skilled occupations (with the exception of some segments of the business services group).<sup>5</sup> By contrast, slowing industry groupings, such as distribution services, have a relatively higher proportion of lower-skilled employees. As a result of these trends, 60 per cent of the overall services workforce is now employed in skilled occupations. The common view of services jobs as ‘menial’ is not correct.

Figure 1.9 Structural changes within services<sup>a,b</sup>



<sup>a</sup> Service industry groupings as defined in box 1.3, except for Electricity, gas and water, and Construction, which are single industry divisions. <sup>b</sup> Annual average of seasonally-adjusted quarterly data (except for 2012 which uses February, May and August quarters only).

Data source: ABS (2012a).

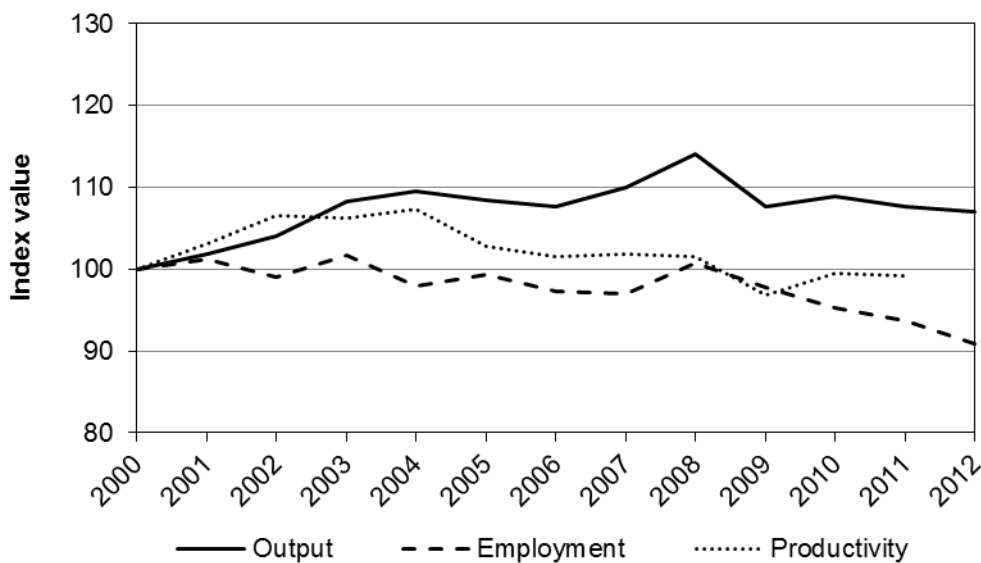
<sup>5</sup> Namely, Administrative and support services, and Rental, hiring and real estate services.

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## What about manufacturing?

In common with patterns observed internationally, manufacturing's share of value added in Australia has been steadily decreasing since the early 1960s (figure 1.7). That said, this sector's output has grown in absolute terms, although it has not yet recovered from its slump during the Global Financial Crisis (figure 1.10). By contrast, employment has contracted in the 2000s, particularly since 2008.

Figure 1.10 **Manufacturing output,<sup>a</sup> employment<sup>b</sup> and multi-factor productivity<sup>c,d</sup>**



<sup>a</sup> Real gross value added. <sup>b</sup> Annual averages of quarterly trend data from August 1999 to June 2012. <sup>c</sup> Gross value added based multifactor productivity index. <sup>d</sup> All data series have been transformed into indexes with base year 2000 = 100.

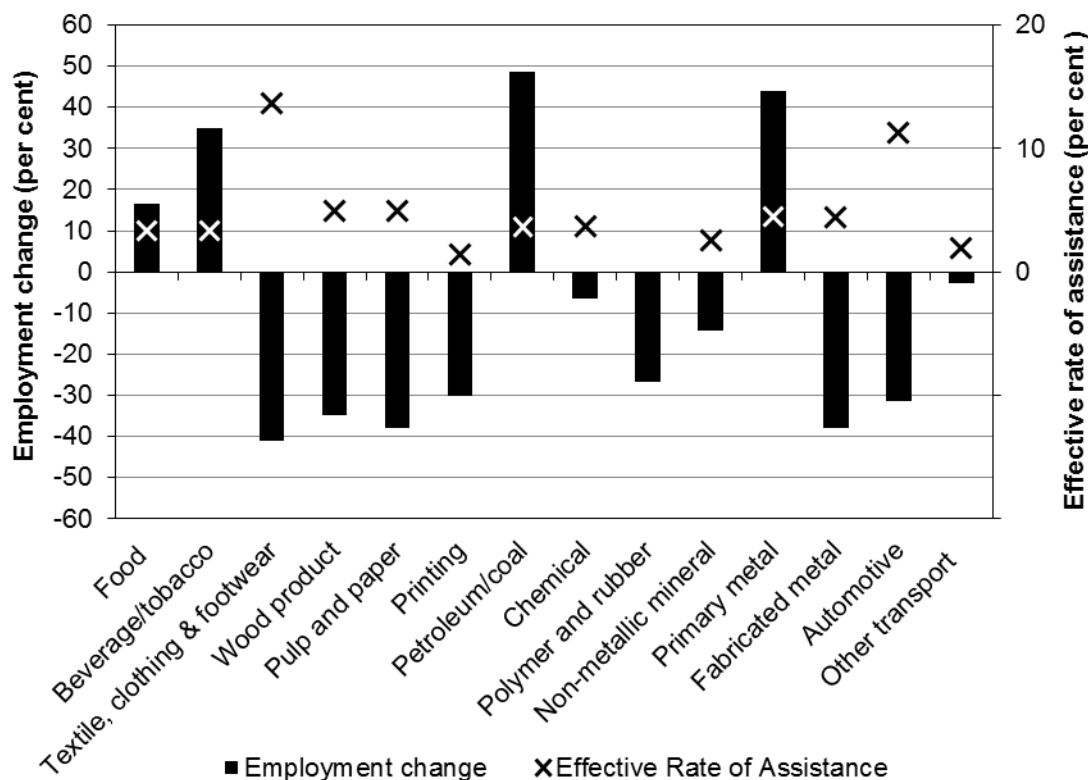
Data sources: ABS (2012a, 2012g, 2011b).

Multifactor productivity in manufacturing rose over the 2000–04 period, but has generally declined since then (figure 1.10). Preliminary indications are that the sector's use of capital grew rapidly in the last complete productivity cycle, without a commensurate growth in output, thus depressing productivity (Barnes, Soames and Li forthcoming).

Job-shedding has affected many manufacturing industries, with some of the largest proportionate falls in employment occurring in Textile, clothing and footwear and Automotive (figure 1.11). This has occurred despite the relatively high effective rates of assistance these industries have received over a long period. Some manufacturing industries, however, have bucked the declining trend in recent times.

Figure 1.11 **Manufacturing employment changes and industry assistance<sup>a,b</sup>**

Per cent change over the period 2003-04 to 2011-12 (left axis) and Effective Rate of Assistance (right axis)



<sup>a</sup> 2011-2012 figures are an average of August 2011, November 2011 and February 2012 quarters. All other years' figures were obtained as annual averages from quarterly data. Only selected manufacturing subdivisions are shown. <sup>b</sup> Effective Rate of Assistance figures adapted from PC (2012b).

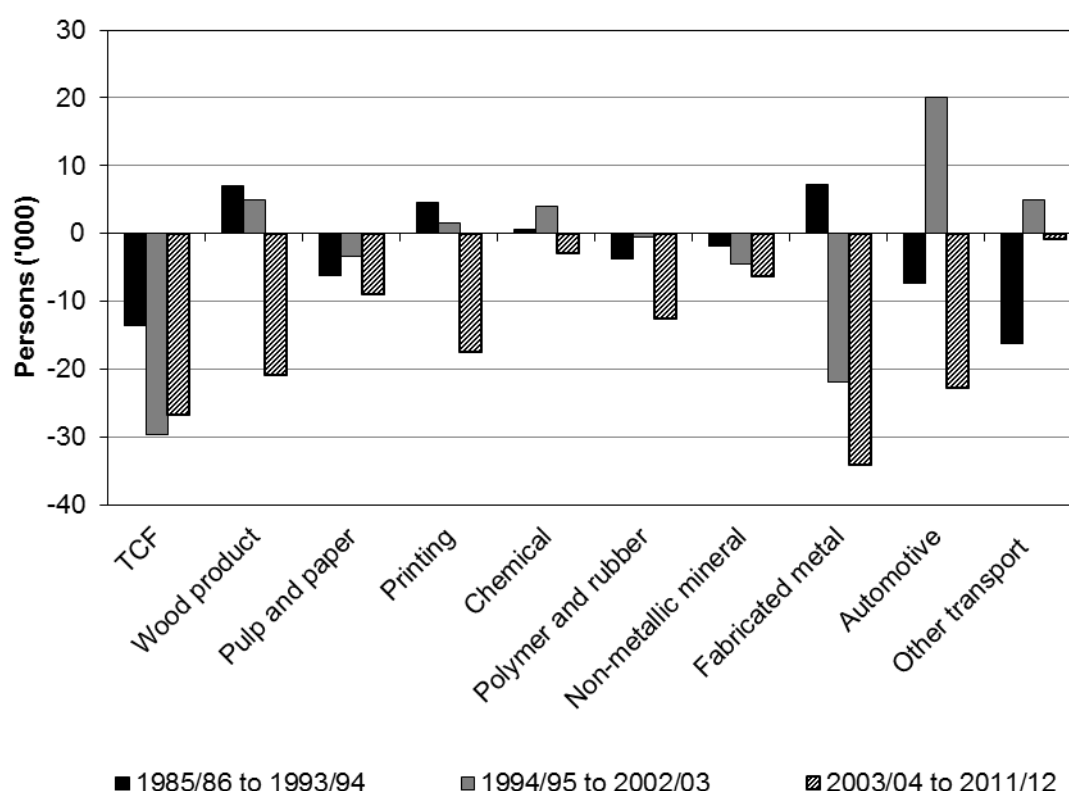
Data sources: ABS (2012a); PC (2012b).

Of those industries recording employment growth, a number have links to the mining sector. For example, it is likely that rising employment in the Primary metal industry is partly mining-induced, particularly in Queensland and Western Australia. This industry's employment growth has been rapid in these jurisdictions (79 per cent and 73 per cent, respectively, between 2001 and 2012), and may have been related to the resources projects in these states. (That Primary metal stands out from the remainder of the manufacturing industry is reflected in the finding that it is the only manufacturing industry to have gained workers in net terms from outside the manufacturing industry between 2001 and 2007 [Li 2011].)

Where employment has been declining in recent years, this has usually involved an accentuation of longer-term trends (figure 1.12). For manufacturing as a whole, the Commission estimates that the combined effect of the rising dollar and the Global Financial Crisis served to bring forward the structural decline of its employment share by between 1.7 and 3.5 years, relative to the pre-existing trend.

This decline notwithstanding, recent modelling by the Commission also suggests that manufacturing will remain a significant part of the Australian economy, given baseline projections about the terms of trade and other economic drivers. While its output and employment shares are projected to decline further, the sector's value added and employment levels are projected to grow in absolute terms by close to 2 per cent and 1 per cent annually, respectively, from now until the middle of this century (PC 2012a). These projected outcomes are, in part, conditional on the assumption that the terms of trade will progressively revert to their 2004-05 level by 2017-18 and remain there thereafter. Nonetheless, taking everything into account, concerns about the 'hollowing out' of the manufacturing sector and the associated loss of key manufacturing skills appear unfounded, as they have proved to be in the Netherlands.

**Figure 1.12 Manufacturing industries with declining employment**  
Change in persons employed over each eight-year period, 1985-86 to 2011-12<sup>a</sup>



<sup>a</sup> 2011-2012 figures are an average of August 2011, November 2011 and February 2012 quarters. All other years' figures were obtained as annual averages from quarterly data. Only selected manufacturing subdivisions are shown.

Data source: ABS (2012a).

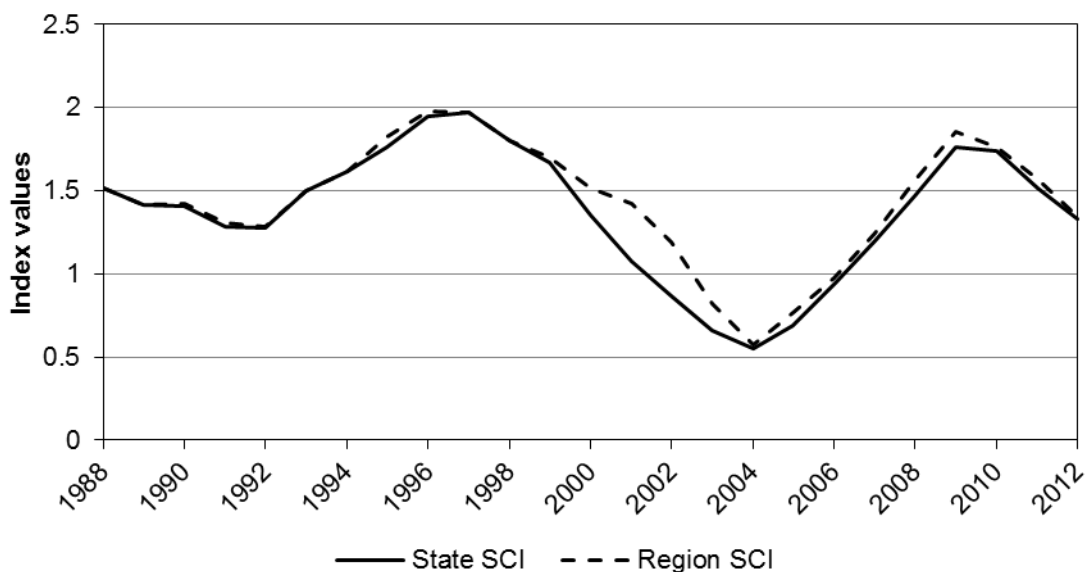
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## Regions have also benefited

Regions differ in their resource endowments, population and labour force profile and industrial composition, and thus can be expected to respond differently to market pressures.

In figure 1.13, two structural change indexes illustrate changing employment shares across states and territories, on the one hand, and between capital cities and regions, on the other. Where a region index exceeds the state/territory index, structural change is occurring *within* each jurisdiction, between the capital city and the balance of that jurisdiction.<sup>6</sup> It is apparent from figure 1.13 that, at certain times during the 1990s and 2000s, employment movements have altered the capital city/regional balance within states and territories.

Figure 1.13 **Employment Structural Change Indexes, by state and territory and region<sup>a</sup>**



<sup>a</sup> 'State SCI' is based on the respective employment shares of all individual states and territories. 'Region SCI' is calculated on the same basis, except that each jurisdiction is divided into two components: state or territory capital city; and balance of the state or territory.

Data source: Productivity Commission calculations using ABS (2012a).

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<sup>6</sup> The direction of urban/regional change is indeterminate from the region index.

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On occasions, a changing urban-regional balance can be a reflection that some regions are facing an exodus of jobs or businesses, or both, for reasons related to structural change. In past decades, there have been many examples of regions or cities that have suffered from the closure of a major regional employer or activity. Workers displaced are able to access the social safety net, and other generally available measures such as retraining and career counselling. At times, however, governments have intervened with the aim of mitigating the adverse effects of, and facilitating adjustment to, rapid and profound changes (box 1.4).

That said, it appears that recent structural changes have been mainly beneficial for Australia's regions. Treasury (2011c) has calculated that, as the aggregate unemployment rate declined from 1998 to 2010, so did the dispersion of unemployment rates across the 1400 Statistical Local Areas (SLAs). In September 2010, around half of the areas had unemployment rates of less than 5 per cent, compared with fewer than 15 per cent of SLAs in 1998.

Unsurprisingly, the benefits of the mining boom have been felt most strongly in some well-publicised regional areas. For example, resident employment in the Pilbara and Kimberley regions of WA has been projected to double between 2005 and 2012, as a result of the boom (ALGA 2012). On the Eastern seaboard, a detailed survey undertaken by Rolfe et al. (2011) showed that, in 2009-10, direct salary payments by the resources sector in Queensland were largest in the Isaac and Central Highlands regions of that state.

While such payments are to the overall benefit of the regions that receive them, they can also involve some transitory costs. For example, substantial increases in mining employment can put pressure on rents, at least until the supply of land and housing catches up with demand.

The impact of the boom has been uneven across Australia. The Commission estimates that, while all SLAs in Australia recorded increases in average wages and salaries between 2004 and 2009, around two thirds of those SLAs that were in the lowest decile for average wages and salaries in 2004 remained in that decile in 2009. Nonetheless, even those lagging SLAs may be expected to have benefitted from the lower import prices and increased government revenue the boom generated.

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#### Box 1.4 **Adjustment assistance by governments**

The general social safety net offers a set of universally-available government services that can mitigate adjustment costs and facilitate transitions of workers experiencing job losses. However, some changes or adjustments may be considered 'beyond normal' in terms of their scope, speed or severity, and give rise to calls for governments to provide 'tailor-made' financial assistance.

Governments have been more likely to accede to such requests when: (i) the changes have been policy-induced, such as in the course of industry reform; or (ii) a region is facing the loss of a major employer or activity. Events of this nature can impose concentrated transitional costs on producers, consumers or workers in a given industry or region.

Industry and regional assistance can take several forms: (i) compensation for the loss of income or of well-defined property rights; (ii) assistance conditional on businesses undertaking new investment, restructuring, amalgamation or exits; and (iii) assistance to build the future capacity and resilience of recipients through diversification.

Total adjustment assistance to industry in 2010-11 by the Australian Government was estimated at around \$1 billion. Assistance packages for the automotive and TCF industries were the largest, with other major beneficiaries including rural industries such as dairy, sugar, fisheries and forestry.

Since 1997, fifteen 'regional structural adjustment funds' have also been established by the Australian Government. These funds are typically provided with the stated aim of helping a particular region preserve jobs when confronted with the loss or downsizing of a major local employer, as was the case with the closure of BHP in Newcastle in 1999. Through competitive grants for investing in plants or equipment, it is hoped that new or expanding businesses will be attracted to the region at risk of job losses.

The scope, eligibility criteria and duration of regional funds vary, but all funds share, to some extent, a lack of detailed pre- and post-evaluation, and monitoring. Their effectiveness in retaining or creating employment has generally been limited, with regions receiving assistance not appearing to adjust better to structural change than their unassisted counterparts.

*Source:* Productivity Commission (2012b).

## **Benefits and costs of recent structural change**

Structural change — and the countless cumulative adjustments that underpin it — is the economy's response to the changing wants of consumers at home and overseas, shaped by price signals and evolving technologies. While structural change imposes costs on some individuals and groups, it is an indication that goods and services are being produced in quantities and with characteristics that match people's demands



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more closely than previously. Moreover, because the additional output tends to be more highly valued by consumers at home or abroad, and is produced more efficiently, incomes rise accordingly.

As discussed in this chapter, structural change during the 2000s has been fostered in large measure by the dramatic rises in the terms of trade and exchange rate, linked to the mining boom. This is not to suggest that all of the changes observed have been mining-induced. Many drivers of change pre-date the boom and will inevitably outlast it. Nonetheless, modelling undertaken for the OECD suggests that the mining boom is in large part responsible for the positive income and consumption effects observed in the last decade (Thompson et al. 2012).

A number of indicators confirm that the Australian community has benefited significantly in this period. For example:

- Gregory and Sheehan (2011) estimate that the direct income effects associated with the mining boom and currency appreciation contributed 60 per cent of the growth in real per capita income from 2003 to 2011 (equivalent to an additional \$7,500 per year at 2011 prices).
- Although the mining industry is up to 80 per cent foreign-owned, it has been estimated that around one-half of the direct mining income accrues to Australian residents, and about the same from the industry's massive investment spending (box 1.5).
- Employee compensation per hour worked rose by 3.5 per cent per annum in real terms between 2003 and 2008, reflecting both higher wages and falling import prices (Gregory and Sheehan 2011).
- The average annual increase in real household disposable income was 2.8 per cent between 2002 and 2011, compared to 1.0 per cent in the preceding decade (Gregory and Sheehan 2011).

The higher incomes accruing to most Australians have been spread widely:

- Between 2003-04 and 2009-10, households in all income quintiles experienced income gains, after living cost changes (AMP and NATSEM 2012).
- A survey of low-socioeconomic status people between 2007 and 2010 found that they had experienced 'a general (if modest) improvement in living standards' (Saunders and Wong 2011).

That said, the disposable incomes of higher-earning households have grown more rapidly, on average, than those of households at the lower end of the distribution (although this trend pre-dates the mining boom) (OECD 2011a).

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### Box 1.5 Mining income benefits to Australians

Connolly and Orsmond (2011) suggest that ‘a little over half’ of mining industry revenue — equivalent to around \$98 billion in 2010-11 — accrues *directly* to Australian residents, as the sum of:

- direct labour costs (around 10 per cent of total mining revenue)
- payments to domestically sourced inputs (around 25 per cent)
- taxes and royalties (nearly 15 per cent)
- after-tax profits paid to Australian resident owners of mining equities (between 5 and 10 per cent).

These authors also venture that half of the total cost of mining investment is spent acquiring domestically supplied labour and other inputs, further adding to the incomes of Australian residents.

As averages, these estimates inevitably obscure the diversity of mining projects. The local content of mining expenditure can vary significantly, depending on the mineral being mined, and the stage a project has reached. For example, some Liquefied Natural Gas projects under construction are thought to have minimal domestic impact, aside from the tax take.

The above estimates reflect only *direct* payments made by mining companies to Australian residents. These payments will produce indirect and flow-on effects, further adding to the income of Australians. To the Commission’s knowledge, no rigorous estimate exists of the Australia-wide magnitude of this indirect income. Rolfe et al. (2011) estimated that the upper-bound indirect and induced value added effects of the Queensland resources sector’s operation and investment were 25 per cent larger than its direct income effects. However, this ratio is unlikely to hold at a national level, where overall resources are limited and one industry’s expansion usually results in another’s contraction.

*Sources:* Connolly and Orsmond (2011); Rolfe et al. (2011); Sheehan and Gregory (2012).

The additional income accruing to households has had positive consequences for the range of goods and services that they are able to consume. Based on ABS Household Expenditure Survey data, AMP and NATSEM (2012) estimate that, between 2003 and 2009:

- the proportion of discretionary expenditure — including restaurant meals and household services — in the total expenditure of ‘working families’ (those with a mortgage and children, and where at least one of the parents works full-time) increased from 40 per cent to 41.2 per cent
- discretionary spending by households in the lowest income quintile increased from 31.9 per cent to 33.5 per cent of their total expenditure.

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A factor likely to have contributed to the increased expenditure on discretionary items is the fall in the price of many basic consumer items. For example, over the 2003–09 period, the average price of clothing and footwear fell by almost four per cent, and that of audio, visual and computing equipment by 75 per cent (ABS 2012d).

At an aggregate level, therefore, income, expenditure and labour market outcomes have been robust by historical standards, including across regions. This is not to suggest that there has not been dislocation or adverse outcomes for certain individuals and households, as in the past (PC 2012c). Nor does it rule out scope to enhance the benefits, while reducing the costs, of structural change.

## **Enhancing flexibility and adaptability is the key**

The structural pressures associated with the mining boom have created significant difficulties for some Australian industries selling on world markets, but these have been integral to the benefits that Australians have reaped from our favourable terms of trade. A key challenge for future policy, therefore, is to ensure that the necessary adjustments can proceed as smoothly as possible. Attempting to forestall structural adjustment — whether prompted by a mining boom or forces such as demographic change or global competition — is unlikely to succeed, and may simply divert pressures onto other parts of the economy.

As the Prime Minister has emphasised, it is important that we make our economy ‘more adaptive, flexible and better able to seize new opportunities’ (Gillard 2012). At the microeconomic level, key areas for policy attention include any impediments to: productivity-enhancing changes within individual enterprises and organisations; the reallocation of capital via the creation of new firms, expansion of established businesses or exit of unprofitable firms; and the mobility of labour across economic activities and regions.

Many such impediments are regulatory in nature. For example, the geographic mobility of labour is hindered by continuing mismatches in occupational licensing across jurisdictions. It is important that all regulations be periodically tested to ensure that their objectives remain appropriate and that they cannot be achieved more cost-effectively.

Similarly, assistance measures directed at firms or regions in competitive difficulty need to be screened for their effects on the wider economy, including on the ability of expanding industries to attract the skilled workers and other resources they need. Adjustment assistance has a role to play but, in most cases, it is best directed at

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displaced or vulnerable employees — for example, through retraining or relocation allowances — rather than at their employers. The experience in Australia and other OECD countries is that selective industry support often inhibits or delays necessary adjustment, and is rarely effective in preserving jobs in the beneficiary firms.

The greater flexibility that has been engendered in the Australian economy through policy reforms has meant that this mining boom has had fewer downsides than those of an earlier era. Regardless of how long the current boom lasts, maintaining — and, where appropriate, extending — this flexibility will be crucial to getting the best out of our economy, for the benefit of the community as a whole.