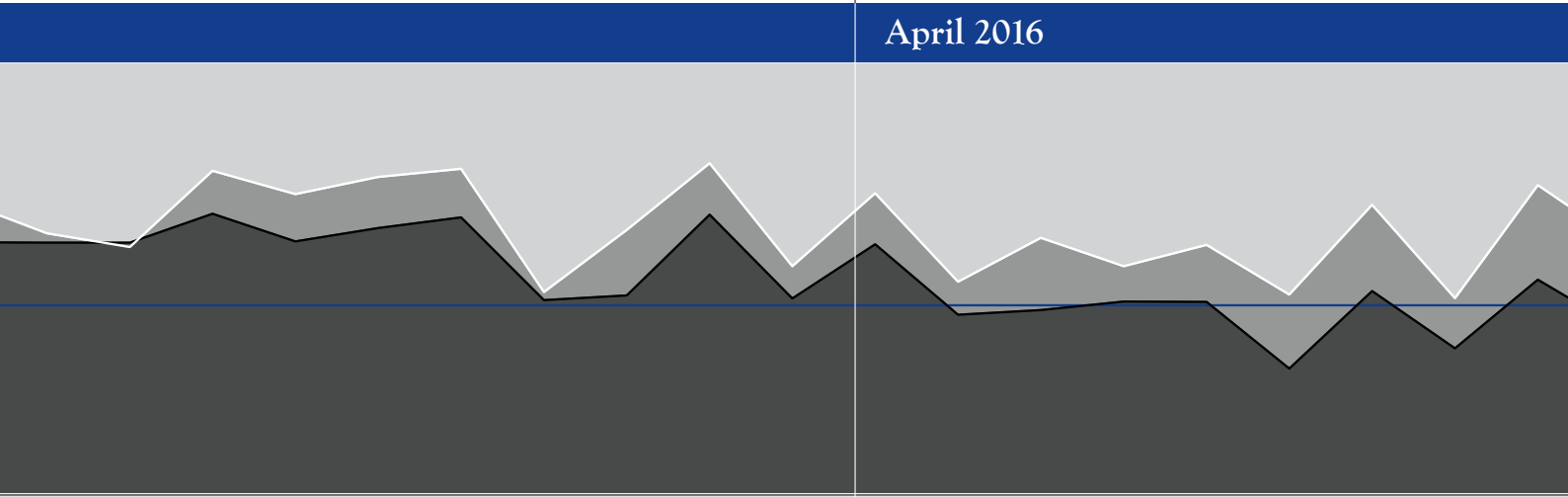




Australian Government
Productivity Commission

PC Productivity Update

April 2016



Features

- ▶ Australian's productivity in 2014-15
- ▶ Contributions to output and per capita income growth
- ▶ Comparing Australia's productivity performance



Australian Government
Productivity Commission

The Productivity Commission is the Australian Government's independent research and advisory body on a range of economic, social and environmental issues affecting the welfare of Australians. Its role, expressed most simply, is to help governments make better policies, in the long term interest of the Australian community.

The Commission's independence is underpinned by an Act of Parliament. Its processes and outputs are open to public scrutiny and are driven by concern for the wellbeing of the community as a whole.

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Foreword



Welcome to the **PC Productivity Update 2016**.

This issue of the **Update** reports on Australia's productivity performance 2014-15. This financial year recorded positive growth of labour productivity (LP) in both the whole economy (1.0 per cent) and the market sector (1.9 per cent). In the meantime, multifactor productivity (MFP) growth in the market sector (0.8 per cent) was the highest in recent years.

In 2014-15, most industries in the market sector exhibited positive productivity growth which is encouraging. Of these industries, MFP growth in Mining (5.5 per cent) was the highest, reflecting the transition of this industry from the 'investment phase' into a 'production phase'.

Despite the positive growth in real production (GDP per capita grew by 0.8 per cent) in this financial year, growth of Australia's per capita income was negative (-0.9 per cent), largely due to a deterioration of the terms of trade (-2.3 per cent). Australia's terms of trade has been on a downward trend since 2012, although in 2014-15 it was still 26 per cent above the historical average over the last five and half decades. If the current trend persists into the future, it will continue to exert downward pressure on the per capita income in Australia.

We welcome your feedback on this edition of the **Update**.

Peter Harris
Chair

Productivity at a glance






Australia's labour productivity growth for the total economy

Annual change, 2013-14 to 2014-15, GDP per hour worked






Labour productivity	+1.0%	
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Australia's productivity growth for the Market sector (12 industries)

Annual change, 2013-14 to 2014-15

Multifactor productivity	0.8%	
Labour productivity	+1.9%	
Output	+2.8%	
Labour input	0.9%	
Capital input	+3.2%	

Long-term, average annual growth rate, 1973-74 to 2014-15

Multifactor productivity	+0.8%	
Labour productivity	+2.3%	
Output	+3.0%	
Labour input	+0.7%	
Capital input	+4.4%	

Data sources: ABS (Australian System of National Accounts, 2014-15, Cat. no. 5204.0, December 2015); ABS (Estimates of Industry Multifactor Productivity, 2014-15, Cat. no. 5260.0.55.002, December 2015).

For more detailed productivity statistics and commentary see Chapter 1.

1 Australia's productivity in 2014-15

Introduction

This analysis of Australia's productivity performance in 2014-15 is based on the latest Australian Bureau of Statistics (ABS) annual estimates of multifactor productivity (MFP) and labour productivity (LP) growth for both the 12 industry market sector as a whole, and for each of its 12 individual industries.

Productivity growth is a key source of long-term economic growth, business competitiveness and real per capita income growth. It is an important determinant of a country's living standards and wellbeing. (Productivity is defined in box 1.1)

Box 1.1 What is productivity?

Productivity (the ratio of output produced to inputs used) measures how efficiently inputs, such as capital and labour, are used to produce outputs in the economy. It is sometimes referred to as productive efficiency. Productivity increases if output grows faster than inputs (or shrinks more slowly). Growth of productivity is the growth of output over and above the growth of inputs.

Multifactor productivity (output produced per unit of combined inputs of labour and capital) is the measure that comes closest to the underlying concept of productivity — efficiency of producers in producing output using both labour and capital. Growth of multifactor productivity is the growth of output over and above the growth of combined labour and capital.

Labour productivity (output produced per unit of labour input) measures efficiency in the use of labour. Growth of labour productivity is the growth of output over and above the growth of labour input — it not only measures change in the efficiency of labour but also captures the value added from growth in capital (and more advanced technology intrinsic in the new investment) that supports increased output without increasing labour.

The Commission's *PC Productivity Update 2013* provides a more detailed discussion of the measurement issues associated with multifactor productivity and labour productivity.

2014-15 market sector update

In 2014-15, the 12-industry market sector represented 64.2 per cent of total industry gross value added (IGVA)¹ accounted for 16 per cent of gross value added. The non-market sector, including Health care and social assistance (7.8 per cent), Public administration and safety (6.2 per cent), and Education and training (5.7 per cent), totalled 19.8 per cent in 2013-14. The remaining four industries² accounted for 16.1 per cent of IGVA. The division into market and non-market sectors arises from the difficulty of measuring MFP in industries where much of the output is not priced by the market. The lack of a reliable price index means that output is usually estimated based on the cost of production, so by definition productivity growth will be zero as output growth is determined directly by input growth.

In terms of output, the four largest market sector industries in 2014-15 were Financial and insurance services (10.3 per cent), Construction (9.8 per cent), Mining (8.0 per cent), and Manufacturing (7.6 per cent), which collectively represented about 35.7 per cent of total IGVA and more than half that of the market sector (box 1.2). Compared with the previous year, IGVA share of Mining declined by 1.7 per cent (from 9.7 per cent to 8.0 per cent), while the shares of Construction and Financial and insurance services increased, respectively, by 0.5 percentage points (from 9.3 per cent to 9.8 per cent) and 0.4 percentage points (from 9.9 per cent to 10.3 per cent).

Box 1.2

Output (IGVA) shares of the 12 industries in the market sector, 2014-15

- ▶ Financial and insurance services: 10.3 per cent
- ▶ Construction: 9.8 per cent
- ▶ Mining: 8.0 per cent
- ▶ Manufacturing: 7.6 per cent
- ▶ Transport, postal and warehousing: 5.6 per cent
- ▶ Retail trade: 5.3 per cent
- ▶ Wholesale trade: 4.8 per cent
- ▶ Information, media and telecommunications: 3.1 per cent
- ▶ Accommodation and food services: 3.0 per cent
- ▶ Electricity, gas, water and waste services: 2.9 per cent
- ▶ Agriculture, forestry and fishing: 2.8 per cent
- ▶ Arts and recreation services: 1.0 per cent.

Source: ABS (Australian System of National Accounts, 2014-15, Cat. no. 5204.0, October 2015).

1 IGVA shares presented in box 1.2 are based on current values of all industry gross value added which excludes Ownership of dwellings.

2 These industries are Rental, hiring and real estate services, Professional scientific and technical services, Administrative support services and Other services. They are included in what is known as the 16 industry market sector but are not covered in this analysis.

In 2014-15 market sector MFP recorded highest growth in recent years

Australia's market sector MFP is estimated to have grown by 0.8 per cent in 2014-15.³ Since 2011-12, annual MFP in the market sector has recorded uninterrupted increases and 2014-15 was the fourth consecutive year of positive growth. This growth was the highest in recent years and comparable with the long term average between 1973-74 and 2014-15 of 0.8 per cent (table 1.1).⁴ This was a result of higher growth in output (by 2.8 per cent) than growth in total inputs (by 2.0 per cent). On the input side, capital input (increasing by 3.2 per cent) was the larger source of input growth compared with the growth of labour (0.9 per cent).

Average annual MFP growth in the market sector remains flat (at 0.0 per cent) in both the current (incomplete) productivity cycle from 2007-08 to 2014-15 and the last complete cycle from 2003-04 to 2007-08. However, long-term MFP growth from 1973-74 remained positive (table 1.1). In the current cycle:

- ▶ output increased by 2.5 per cent, while total inputs by 2.4 per cent⁵
- ▶ positive MFP growth in the last four years just offsets the decline in the early years, resulting in zero growth for the whole period.

Growth of LP results from a growth in MFP and from capital-deepening, an increase in the level of capital relative to labour. This contribution of capital growth is typically positive and larger than MFP (table 1.1).

In 2014-15, LP growth was 1.9 per cent, down from 2.6 per cent in the previous year, the slowest since 2011-12. The reduced rate of LP growth was due to a significant decrease in the measured contribution of capital — capital deepening declined from 2.0 per cent in 2013-14 to 1.1 per cent in the last year. This was below its longer-term average between 1973-74 and 2013-14 (1.6 per cent).

Since 2011-12, LP growth has been less reliant on the growth of capital investment and more on the growth of MFP. This has been the pattern observed in the past four years.

3 The growth rates used in the latest ABS publication of productivity estimates (ABS, *Estimates of Industry Multifactor Productivity, 2014-15*, Cat. no. 5260.0.55.002) are expressed as changes in natural logarithms multiplied by 100. For consistency, this paper has also applied this method to productivity data sourced from ABS publications.

4 Annual rates of MFP and LP growth are affected by the utilisation rate of inputs (notably capital) as well as other factors. Hence some of this annual change can be due to the effect of the business cycle. For this reason, the ABS also reports estimates over the productivity cycles which match peaks in the business cycle. This concept was explained in the *PC Productivity Update 2013* (p. 13).

5 By definition, MFP growth equals the difference between the growth rates of output and total inputs. In Table 1.1, this equality does not hold exactly, due to the rounding of the numbers for MFP and total inputs.

Table 1.1
Summary productivity statistics, 12-industry market sector^{a,b}

Per cent

	Long term growth rate	Last complete cycle	Period since the last cycle	Latest years		
	1973-74 to 2014-15	2003-04 to 2007-08	2007-08 to 2014-15	2012-13	2013-14	2014-15
Output (GVA)	3.0	4.0	2.5	2.5	2.5	2.8
Total inputs	2.2	4.0	2.4	2.2	2.0	2.0
Labour input	0.7	2.4	0.1	-1.1	-0.1	0.9
Capital input	4.4	6.0	4.9	5.8	4.2	3.2
MFP	0.8	0.0	0.0	0.3	0.6	0.8
Capital deepening ^c	1.6	1.7	2.3	3.3	2.0	1.1
Labour productivity	2.3	1.6	2.3	3.6	2.6	1.9
Capital labour ratio	3.7	3.6	4.8	6.9	4.3	2.3

^a Annual growth rates or average annual growth rates in designated periods. Cycles refer to productivity cycles. ^b Includes Divisions A to K and R. Excludes Divisions L Rental, hiring and real estate services; M Professional, scientific and technical services; N Administration and support services; and S Other services. These four service sectors are excluded from the analysis due to issues around the measurement of capital services in these industries. Also the 12-industry market sector has a longer time-series. See *Experimental Estimates of Industry Multifactor Productivity, 2009-10* (ABS Cat. No 5260.0.55.002). ^c Capital deepening is the change in the ratio of capital to labour, weighted by the capital share of market sector income. Labour productivity growth equals the sum of the growths of MFP and capital deepening.

Source: Productivity Commission estimates based on ABS (*Estimates of Industry Multifactor Productivity, 2014-15*, Cat. no. 5260.0.55.002, December 2015).

Most industries in the market sector exhibited positive MFP and LP growth in 2014-15

In 2014-15, MFP improved in 7 out of the 12 industries in the market sector. These industries are Agriculture, forestry & fishing (1.2 per cent), Mining (5.5 per cent), Electricity, gas, water & waste services (Utilities) (2.5 per cent), Wholesale trade (0.9 per cent), Accommodation and food services (2.0 per cent), Information, media & telecommunications (4.5 per cent) and Financial and insurance services (4.0 per cent).

Particularly significant was the change in the productivity of the Mining and Utilities industries. The strong MFP growth in the Mining industry in 2014-15 was associated with strong output growth (7.6 per cent) and moderate growth of total inputs (2.1 per cent). On the input side, labour input declined by 12 per cent and growth of capital was 7.4 per cent (compared with 11.6 per cent in the previous year) — reflecting a transition from an 'investment phase' into a 'production phase' (PC 2015). In 2014-15, the significant fall in labour input also led to an extraordinary growth in measured LP (22.4 per cent).

In 2014-15, a similar pattern of change happened in the Utilities industry where MFP growth (2.5 per cent) was associated with a 1.4 per cent growth in output and 1.1 per cent decline in total inputs. In this industry, input of labour fell by 5.9 per cent and capital recorded a 1.6 per cent growth (down from 2.7 per cent in the previous year), resulting in a 7.8 per cent increase in measured LP.

The changes in these two industries had a significant influence on the measured MFP growth in the market sector. In the Mining industry, the measured MFP growth was consistently negative in the 2000s (Topp *et al.* 2008) and, in the Utilities industry, it was negative for more than two decades (Topp and Kulys 2012).

The Commission found that these two industries (and Agriculture, forestry and fishing) were major contributors to the deterioration in the measured MFP of the market sector in the 2000s (PC 2009). The Commission's analysis (presented in PC 2015) suggested that MFP growth in Mining would turn positive in the near future; and with the move from the investment to the production phase this was confirmed in the 2014-15 data.

The five other industries that experienced positive MFP (as well as LP) growth in 2014-15 featured output growth that outpaced input growth — output increased by 7.0 per cent in Accommodation and food services, 9.4 per cent in Information, media & telecommunications, 4.6 per cent in Financial and insurance services, 2.5 per cent in Wholesale trade and 1.5 per cent in Agriculture, forestry and fishing. On the input side, capital services grew in all five industries, but labour declined in Agriculture, forestry & fishing (-1.1 per cent) and in Financial and insurance services (-1.4 per cent).

In 2014-15, five industries experienced negative MFP growth — Manufacturing (-0.5 per cent), Construction (-2.3 per cent), Retail trade (-0.6 per cent), Transport, postal & warehousing (-3.9 per cent) and Arts and recreation services (-4.3 per cent). The productivity performance of these industries can be classified into two groups.

In the first group, positive output growth was recorded in Retail trade (2.6 per cent) and Arts and recreation services (3.0 per cent). In Retail trade, MFP declined only marginally. Given the positive growth in output, the significant drop of MFP in Arts and recreation services was mainly attributable to a significant rise in the labour input (9.9 per cent).

Table 1.2
Industry productivity growth 2014-15

Per cent

	Output (GVA)	Total inputs	Labour input	Capital input	Labour productivity	MFP
Agriculture, forestry and fishing	1.5	0.3	-1.1	1.0	2.6	1.2
Mining	7.6	2.1	-12.0	7.4	22.4	5.5
Manufacturing	-1.2	-0.7	-0.2	-1.5	-1.0	-0.5
Electricity, gas, water and waste services	1.4	-1.1	-5.9	1.6	7.8	2.5
Construction	-0.7	1.6	0.1	5.6	-0.8	-2.3
Wholesale trade	2.5	1.5	1.0	2.6	1.5	0.9
Retail trade	2.6	3.2	2.5	5.1	0.1	-0.6
Accommodation and food services	7.0	4.9	6.0	1.1	0.9	2.0
Transport, postal and warehousing	-0.9	3.2	3.8	2.3	-4.5	-3.9
Information, media and telecommunications	9.4	4.7	7.7	2.8	1.5	4.5
Financial and insurance services	4.6	0.5	-1.4	1.8	6.1	4.0
Arts and recreation services	3.0	7.6	9.9	3.1	-6.3	-4.3
Market sector (12)	2.8	2.0	0.9	3.3	1.9	0.8

Source: Productivity Commission estimates based on ABS (*Estimates of Industry Multifactor Productivity, 2014-15*, Cat. no. 5260.0.55.002, December 2015).

The three other industries recorded a fall in the level of output — Manufacturing by -1.2 per cent, Construction by -0.7 per cent and Transport, postal & warehousing by -0.9 per cent. For Manufacturing, a decline in output was accompanied by a fall in the inputs of both capital and labour but, for Construction and Transport, postal & telecommunication, total inputs increased.

Taking a longer-term perspective, eight of the twelve industries in the market sector recorded positive MFP growth in nearly all sub-periods between 1989-90 and 2014-15 (figure 1.1). Over this period, average annual MFP growth was highest in Agriculture, forestry and fishing (2.6 per cent) and financial and insurance services (2.3 per cent). They were followed by Wholesale trade (1.8 per cent) and Retail trade (1.7 per cent).

In the Mining and Utilities industries, average annual MFP growth was negative for the whole period and has remained negative in all sub-periods since 1998-99. MFP growth in Manufacturing has also been weak since 1998-99 (at 0.3 per cent) over the whole period. MFP growth in Arts and recreation services was negative over the whole period (-0.5 per cent) and in the most recent subperiod.

Figure 1.1
Industry MFP, 1989-90 to 2014-15^a

Per cent per year

	1989-90 to 1993-94	1993-94 to 1998-99	1998-99 to 2003-04	2003-04 to 2007-08	2007-08 to 2014-15	1989-90 to 2014-15
Agriculture, forestry and fishing	3.4	3.8	3.5	-0.9	2.6	2.6
Mining	2.1	0.4	-0.2	-3.8	-4.1	-1.4
Manufacturing	0.7	0.9	1.0	-1.2	-0.1	0.3
Electricity, gas, water and waste services	2.8	1.9	-2.2	-4.9	-2.8	-1.2
Construction	0.3	2.8	1.0	0.9	0.9	1.2
Wholesale trade	-2.0	5.3	3.1	-0.1	1.5	1.8
Retail trade	2.0	2.3	2.0	0.4	1.7	1.7
Accommodation and food services	-0.7	2.0	1.0	0.6	0.1	0.6
Transport, postal and warehousing	2.1	2.2	1.6	0.9	-0.8	1.0
Information, media and telecommunications	5.1	3.1	-1.1	0.1	0.5	1.4
Financial and insurance services	4.5	2.3	0.7	3.7	1.4	2.3
Arts and recreation services	-0.7	-1.7	0.9	-1.6	0.1	-0.5
Market sector	1.2	2.6	1.0	0.0	0.0	0.9

^a Figures in this table are average annual growth rates. Periods defined according to productivity cycles.

Sources: Productivity Commission estimates based on ABS (*Estimates of Industry Multifactor Productivity, 2014-15*, Cat. no. 5260.0.55.002, December 2015).

2 Contributions to output and per capita income growth

Productivity is a measure of efficiency in production. It should not be considered an end in itself, but for what it contributes to improved wellbeing in the long run, through the growth of output and income. Higher productivity is an essential component to meeting the challenges of an ageing population.

Real GDP growth can be decomposed into three components: growth in the population, in participation rates, and in labour productivity. Changes in participation are determined by the **share of population of working age**, their **labour market participation, employment share** (share actually working, which is the inverse of the unemployment rate) and the **average hours worked per person employed**.

In 2014-15, real GDP increased by 2.2 per cent (figure 2.1). Growth of population (1.4 per cent per year) and economywide labour productivity¹ (1.0 per cent per year) made a positive contribution, while the fall in participation rate detracted from real GDP growth by 0.2 per cent. This pattern is similar to that in the period between 2010-14.

Growth in the population can increase the size of the economy but does not, in itself, increase output or income per capita. Growth of per capita income is determined by changes in participation (referred to as 'labour utilisation' in figure 2.2), labour productivity, the terms of trade and in net foreign income.

In 2014-15, per capita income growth was -0.9 per cent, contrasting markedly with the positive average annual income growth in the five and half decades since 1960. The main contributor to the negative growth was the falling terms of trade (-2.3 per cent) while the slight decline of labour utilisation (-0.1 per cent) also made a contribution. The growth of net foreign income and labour productivity were positive but they were more than offset by the deterioration in the terms of trade and labour utilisation.

In the Australian economy, periods of negative income growth have been infrequent. Since 2012-13, per capita income has declined in three consecutive years which has not been experienced in the five and half decades since 1960. The main reason is the large decline in Australia's terms of trade which started rising in 1999 reaching its peak in 2012 (figure 2.3).

Since then, it has fallen by 25 per cent. It is worth noting that in 2015 the terms of trade was still 26 per cent above the average level between 1960 and 2015. If the terms of trade continue its current downward trend, it will exert further pressure on the level of Australia's income in the years to come.

1 Economy-wide labour productivity is defined as real GDP per hour worked.

Figure 2.1
Contributions to the growth in aggregate real output, 1979-80 to 2014-15^a

Per cent per year



^a Periods are based on years ending in June. For example, the 1980s refers to the 1979-80 to 1989-90 period. The 2000s refers to 1999-00 to 2009-10.

Sources: Productivity Commission estimates based on ABS (*Labour Force, Australia*, Cat no. 6202.0; *Population by Age and Sex, Australian States and Territories*, Cat. no. 3201.0; *Australian National Accounts: National Income, Expenditure and Product*, Cat. no. 5206.0; and *Labour Force Historical Time series, Australia, 1966 to 1984*, Cat. no. 6204.0.55.001).

Figure 2.2
Contributions to average annual per capita income growth^{a,b}

Percentage points contribution, annual average

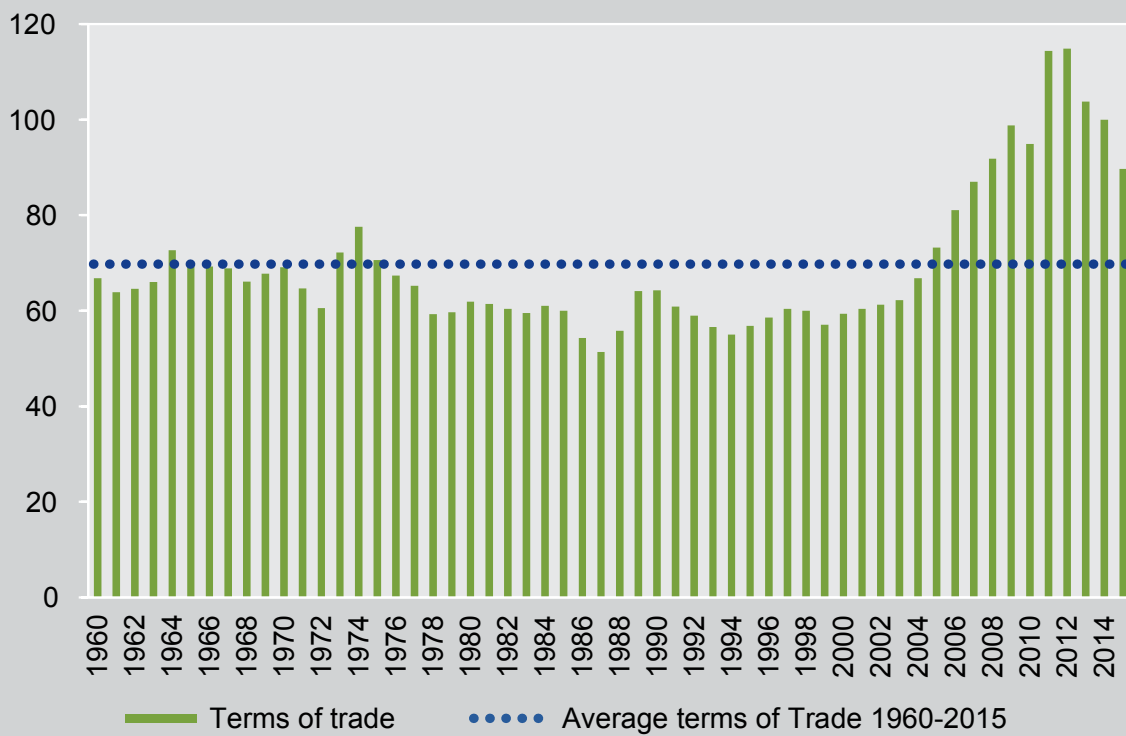


^a Post 1970s, periods are based on years ending in June. For example the 1980s refers to the 1979-80 to 1989-90 period. The 2000s refers to 1999-00 to 2009-10. ^b Labour utilisation refers to labour participation.

Source: Productivity Commission estimates based on ABS (*Australian System of National Accounts, 2014-15*, Cat. no. 5204.0).

Figure 2.3
Australia's terms of trade, 1960–2015

Index 2014 = 100



Source: ABS (*Australian System of National Accounts, 2014-15*, Cat. no. 5204.0, October 2015).

3 Comparing Australia's productivity performance

International data from the Conference Board's Total Economy Database indicate that MFP growth in Australia was -0.9 per cent in 2014^{1,2}. This was comparable with Singapore (also -0.9 per cent), higher than New Zealand (-1.5 per cent), Norway (-1.2 per cent) and Japan (also -1.2 per cent), but lower than the rest of the countries and regions presented in figure 3.1.

In recent years, negative MFP growth was not unique to Australia (figure 3.1). In 2014, world average MFP growth was -0.2 per cent and most countries in Europe and Asia-Pacific regions recorded a fall in productivity. The exception was North America where both the United States and Canada reported positive MFP growth.

Since 2008 Australia, New Zealand and European countries experienced a prolonged period of negative MFP growth. The Conference Board suggested that for some economies this may reflect a difficult process of recovering from the 2008 Global Financial Crisis and the productivity performance in 2014 is just a continuation of the process. But other research indicates that the trend is of longer duration so this is not a clear nor comprehensive answer (see for example, *Byrne et al.* 2016). The persistent decline of MFP across developed economies remains of serious research interest.

-
- 1 In order to ensure comparability of international productivity estimates, the Conference Board applied certain modifications to the estimation methods. As a result, the productivity estimates for Australia in this section differ somewhat from ABS estimates.
 - 2 In this edition of *PC Productivity Update*, the reference year of international productivity estimates is 2014. The Conference Board will not publish international productivity data for 2015 until May 2016.

Figure 3.1
MFP growth in selected countries and regions

Averages of yearly growth rates and annual growth rates, per cent

	1998 to 2007	2008 to 2012	2013	2014
World	1.1	0.2	0.0	-0.2
France	0.5	-0.6	-0.4	-0.6
Germany	0.9	-0.1	-0.5	-0.3
Ireland	0.5	-0.8	-2.6	2.3
Norway	-0.4	-2.1	-1.9	-1.2
Sweden	1.4	-1.1	-0.2	-0.2
United Kingdom	0.6	-1.1	-0.4	-0.1
Europe	0.6	-0.6	-0.4	-0.3
Canada	0.0	-0.5	0.1	0.2
United States	0.8	0.3	0.6	0.1
Australia	0.1	-0.9	-1.5	-0.9
New Zealand	0.0	-0.7	-0.9	-1.5
China	3.7	1.7	0.1	-0.1
India	1.7	2.5	-0.5	0.2
Japan	0.5	0.0	1.0	-1.2
Singapore	2.1	-0.1	0.1	-0.9
South Korea	2.7	1.6	0.6	0.6

Source: The Conference Board Total Economy Database, May 2015, <http://www.conference-board.org/data/economydatabase>.

Productivity and Australia's relative economic wealth

In recent years, despite comparatively low MFP growth, Australia has maintained its position in the rank of per capita GDP relative to other developed economies. In 2014, the Australian economy was ranked 5th in per capita GDP among OECD countries, behind Luxemburg, the United States, Iceland and Norway (figure 3.2).

Australia held similar positions in the 1950s but its ranking slipped over the following two and a half decades. It dropped to 15th in 1983 and again in 1991 and 1992.

Since then Australia's international ranking has risen. This improvement has been linked to sustained economic reforms during the 1980s and 1990s, including: the opening up of trade and capital markets to competition; partial deregulation, commercialisation and privatisation of state owned enterprises; labour market reforms that reformed the centralized wage fixing system; and National Competition Policy reforms (PC 1999). These resulted in better utilisation of labour and capital by business and enabled the Australian economy to innovate, taking advantage of newly developed information and communication technologies. As a result, Australia's MFP increased by 1.8 per cent a year between 1993-94 and 2003-04 and its ranking in per capita GDP was lifted to 8th by 2003.

The Global Financial Crisis in 2008 had a widespread impact across the world but its impact on Australia was moderate. Since then, Australia's per capita GDP ranking improved further and has remained among the top 5 in nearly all the years since 2008.

Figure 3.2 also suggests that Australia's international per capita GDP ranking has been somewhat related to movements in the terms of trade.³ The terms of trade are an index of Australia's export prices relative to import prices. Global demand for iron ore and other mining products rose in the 2000s driving up the prices of Australian mining exports. The resulting investment boom in mining contributed to the Australian dollar strengthening, which reduced the cost of Australian imports. Combined, this resulted in very rapid growth in the terms of trade, which contributed to the rise in Australian GDP during the recent 'resource boom'.⁴

Since 2012, Australia's per capita GDP has been falling with the terms of trade. Without a lift in productivity to counteract the fall in the terms of trade, slower per capita GDP growth is likely to prevail in the years to come, relative to the growth that occurred in the period 2000-2010.

3 Changes in Australia's per capita GDP can deviate from changes in the terms of trade. Since 1960, significant deviations happened in three periods: from mid-1970s to early 1980s, between late 1980s and early 1990s and the years leading to the GFC.

4 Thompson *et al.* (2012) observed that, between 2000 and 2010, the combined increase in demand for Australian exports and decrease in the cost of Australian imports — has been a major source of change in the structure of prices for Australian producers and consumers: the price of exports increased nearly 20 per cent, and the price of imports fell nearly 10 per cent (adding up to a 30 per cent improvement in the terms of trade).

Figure 3.2
Australia's economic ranking and terms of trade

Real GDP per capita in 1990 US\$ (converted at Geary Khamis PPPs), OECD countries



Source: The Conference Board Total Economy Database™, May 2015, <http://www.conference-board.org/data/economydatabase>; ABS (Australian System of National Accounts, 2014-15, Cat. no. 5204.0, October 2015).

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