



Annual productivity bulletin 2024

Key points

- * **Labour productivity for the whole economy fell by 3.7% in 2022-23.**
 - Labour productivity fell because output growth failed to keep pace with a record increase in hours worked.
 - High hours worked also led to a historical decline in the capital-labour ratio (4.9%). This meant workers had access to less capital on average, which weighed down labour productivity.
 - The 2022-23 declines in labour productivity and the capital-labour ratio were historical outliers.
 - During the pandemic productivity rose rapidly but last financial year saw that productivity growth disappear. By the end 2022-23, labour productivity was about the same as before the pandemic for the whole economy (0.8%), but well above the pre-pandemic level for the market sector (2.4%).
- * **Multifactor productivity fell by 0.5% in the market sector.**
- * **The wholesale trade and accommodation and food services industries contributed to more than 50% of the decline in market sector labour productivity last financial year.**
 - The wholesale trade industry also contributed to the largest decline in multifactor productivity (0.4 percentage points), followed by rental, hiring and real estate services (0.2 percentage points).
- * **Across the whole economy, a gap remained between growth in real wages and labour productivity.**
 - In 2022-23, labour productivity and real producer wages both fell by 3.7%.
 - Overall wage decoupling has decreased to 0.54 percentage points per annum since 1994-95 (down from 0.56 percentage points between 1994-95 and 2021-22 estimated last year).
 - Wage decoupling in two industries – mining and agriculture – dominate the aggregate results, but employ only 5% of the workforce.
 - Wage decoupling for the rest of the workforce is 0.18 percentage points per annum since 1994-95. The fall in wages over 2022-23 for the rest of the workforce (4.6%) exceeded the fall in labour productivity (3.5%).

1. Whole of economy growth and productivity¹

Productivity fell over 2022-23

Labour productivity and MFP fell in 2022-23. This reversed productivity gains observed throughout the earlier stages of the COVID-19 pandemic.

More hours worked led to falling labour productivity

Over the 2022-23 financial year, labour productivity fell for the whole economy (-3.7%) and the market sector (-2.9%).² This was well below their long-term averages of 1.3% and 1.8% respectively (table 1).

The decrease in labour productivity was a result of large increases in hours worked for the whole economy and market sector (both 6.9%). This increase in hours worked is unprecedented – the next highest growth rate on record was 4.3% for the whole economy (in 1988-89), and 3.8% for the market sector (in 1999-2000). The growth in hours worked outpaced growth in output for the whole economy (3%) and the market sector (3.8%).

Table 1 – Aggregate productivity statistics^{a,b}

	Latest years		Most recent five years	Long-term growth rate
	2022-23	2021-22	2018-19 to 2022-23	1994-95 to 2022-23
	%	%	%	%
Whole economy				
Output (real GDP)	3.0	4.3	2.3	3.1
GDP per capita	1.0	3.7	1.0	1.7
Hours worked	6.9	2.7	2.1	1.7
Labour Productivity	-3.7	1.6	0.2	1.3
Terms of trade	-0.5	11.8	5.9	3.1
Gross national income per capita	0.4	3.3	2.1	2.2
Gross domestic income per capita	0.9	6.3	2.3	2.3
Market sector				
Output (GVA)	3.8	4.5	2.0	3.2
Inputs	4.3	1.9	1.5	2.4
Hours worked	6.9	2.0	1.5	1.4
Capital services	1.6	1.8	1.5	3.8
Labour productivity	-2.9	2.5	0.5	1.8
MFP	-0.5	2.6	0.5	0.8

a. Some figures will not appear to add correctly due to rounding to one decimal place. Gross value added (GVA) output is Gross domestic product (GDP) less taxes less subsidies on products and the statistical discrepancy. Labour productivity is the growth in output per unit of labour input. Multifactor productivity growth is the growth in gross value added less the growth of hours worked and capital services, each weighted by their share of total factor income. **b.** All values are in real, chain weighted, terms.

Sources: Estimates based on: ABS (2023, Australian System of National Accounts, 2022-23, 5204.0, tables 1 and 13).

¹ The 2024 Annual productivity Bulletin reports on movements in productivity up to and including the 2022-23 financial year and provides data on national income and productivity to add to the Commissions' quarterly bulletin releases. Data on multifactor productivity (MFP) and capital services is only released annually, and therefore not included in the quarterly bulletins.

² The market sector refers to those industries where prices are set in markets (as opposed to supplied by government). Importantly, multifactor productivity is only estimated for the market sector because prices better reflect the underlying demand for and supply of output. Data constraints also make it difficult to estimate MFP for non-market sectors.

Changes in capital per worker are a key driver of changes in labour productivity. The increase in hours worked led to a decline in the capital-labour ratio (4.9% – the largest decline on record), as the capital stock did not keep pace. This resulted in a decline in labour productivity as workers had access to less capital, and as a result were, on average, less productive.

Last years' annual bulletin observed that labour productivity increased rapidly at the start of the pandemic, citing a rapid drop in hours worked, combined with relatively sticky output (PC 2023a). The decrease in labour productivity in 2022-23 reversed gains observed at the start of the COVID-19 pandemic. The fall in labour productivity reflects, in part, an unwinding of the distortionary effects of the COVID-19 pandemic (PC 2023c, p. 2). Overall, labour productivity was 0.8% above its pre-pandemic average at the end of 2023-23, and 2.4% above its pre-pandemic average at the end of 2022-23 within the market sector.^{3,4}

Looking beyond the 2022-23 annual data, the decline in labour productivity appears to have halted in the first quarter of the 2023-24 financial year, although this is largely attributable to a fall in hours worked (PC 2023c, p. 2).

Multifactor productivity declined possibly due to a labour measurement effect

MFP fell by 0.5% in the market sector as growth in combined inputs⁵ (4.3%) outpaced growth in output (3.8%).

Figure 1 decomposes labour productivity growth into MFP growth and productivity growth attributable to capital deepening. While the increase in hours worked drove most of the fall in labour productivity, a negative MFP also contributed to the decline. As hours worked increase, and capital per worker declined, we would expect labour productivity to fall, which is consistent with what is observed. MFP however is not traditionally impacted by declines in the capital-labour ratio, but in a tight labour market the negative MFP may be due to a labour measurement effect.

The 2022-23 fall in MFP suggests that the additional hours worked did not produce a commensurate increase in output. In other words, on average, new workers did not match the (measured) productivity of those already in the workforce, bringing overall productivity down. Because the labour productivity figures do not adjust for the quality of labour, any change in quality is captured by MFP. A decline in MFP there partly reflects that some of the additional hours were worked by less experienced or less productive labour. The decline in MFP also, in part, reflects that the increase in hours was more likely to occur in relatively low-productivity sectors.

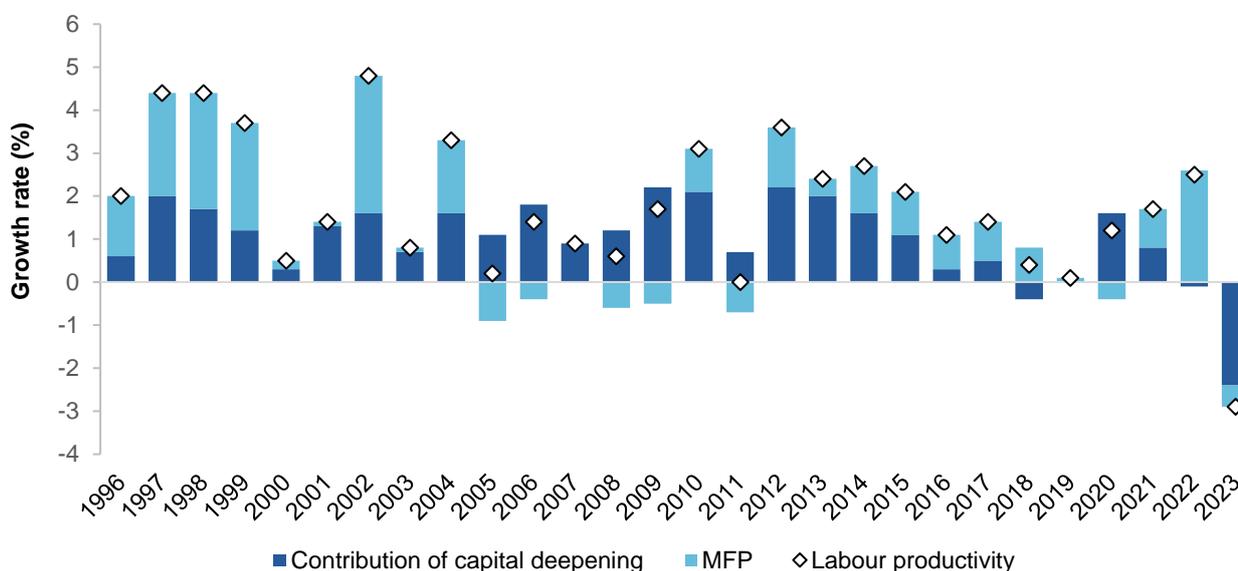
³ This differs slightly from the figure reported in the December 2023 quarterly bulletin as quarterly data compares labour productivity from the most recent quarter only with the five-year average prior to the COVID-19 pandemic.

⁴ The corollary to this result is that productivity in the non-market sector has fallen below its pre-pandemic levels. Further research is needed to understand what has driven differences in labour productivity growth between the market and non-market sectors across the pandemic.

⁵ Combined inputs refers to a combination of hours worked and capital services.

Figure 1 – MFP fell by 0.5% in the market sector in 2022-23

Labour productivity growth and the contributions from capital deepening and MFP in the market sector



Source: Commission estimates using ABS (2023, Australian System of National Accounts, 2022-23, 5204.0, table 13).

At an industry-level, the wholesale trade industry contributed to the largest decline in market sector MFP growth; accounting for 0.4 percentage points of the 0.5% decrease, followed by rental, hiring and real estate services (0.2 percentage points). These industries had slightly different changes in inputs – wholesale trade had the third largest increase in hours worked (15.7%), which was not matched by increased output (only 2.5%), indicating possible difficulties to absorb new labour. Rental, hiring and real estate services had relatively modest growth in hours worked (6.1%) but almost no growth in output.

Despite this fall, MFP was 2.6% higher at the end of 2022-23 than it was pre-COVID (2018-19), as output in the market sector has grown faster than combined inputs over the past five years.

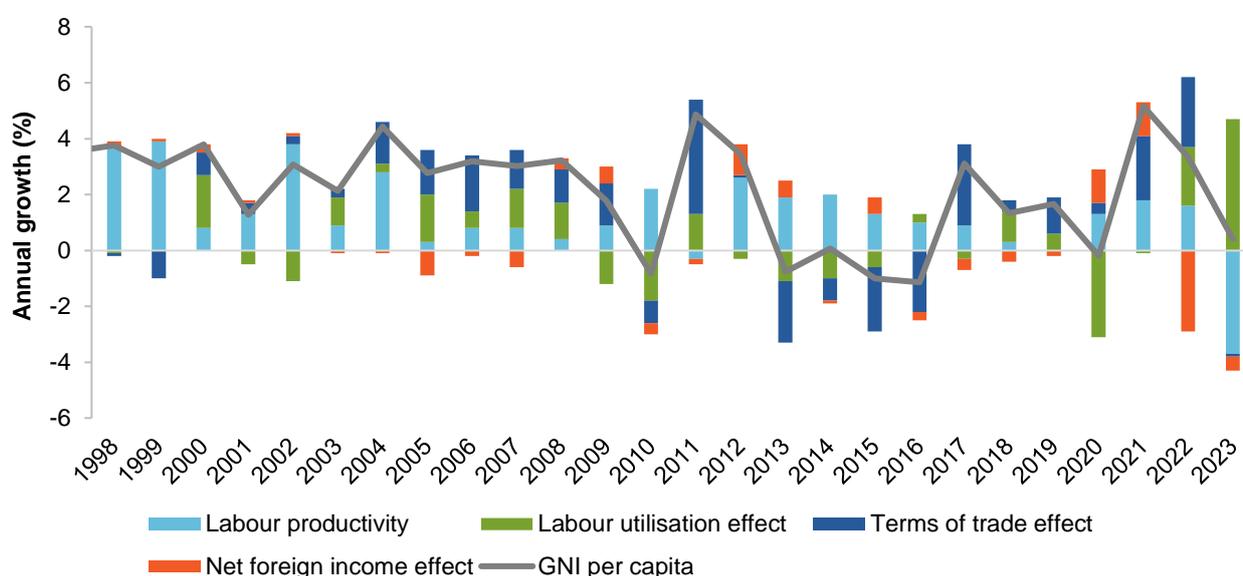
The fall in labour productivity hurt incomes

Productivity growth is the main driver of long-term income growth.⁶ This is because real income growth generally follows its longer-term relationship with labour productivity growth (PC 2022, pp. 13–14).

Despite a fall in labour productivity over 2022-23, gross national income grew by 0.4% (figure 2). The growth in income was driven by increased labour utilisation as Australians worked more hours. Given Australia was near historical high levels of labour force participation at the end of 2022-23, labour utilisation is unlikely to be a major driver of future income growth.

⁶ Growth in incomes (GNI per capita) can be decomposed into the contributions from: labour productivity (production per hour); labour utilisation; the terms of trade (which boost the income from production); and the net flow of foreign income (the income from overseas assets owned by Australians minus the income paid to foreigners from domestic assets) (figure 2).

Figure 2 – The fall in labour productivity weighed down national income growth
Growth in gross national income and labour productivity, and the contributions from labour utilisation^a, the terms of trade^b, and the net inflow of foreign income^c



a. The effect of labour utilisation is defined as the difference between GDP per capita growth and labour productivity growth. **b.** The terms of trade effect is defined as the difference between GDI growth and GDP growth. **c.** The net foreign income effect is defined as the difference between growth in GNI and growth in GDI.

Source: Commission estimates using ABS (2023, *Australian System of National Accounts*, 2022-23, Cat. no. 5204.0, table 1).

2. Industry-level productivity

Productivity decreased in 11 out of 16 industries

Labour productivity grew most in the professional, scientific and technical services industry (3.0%), while the wholesale trade industry experienced the largest fall (11.4%). Labour productivity decreased in 11 out of the 16 market sector industries.

MFP also varied by industry (table 2), with half of the market sector industries experiencing positive and half experiencing negative MFP growth. MFP and labour productivity growth mostly followed similar patterns. For example, labour productivity and MFP both grew strongly in the agriculture, forestry and fishing industry, while the wholesale trade industry had the weakest MFP and labour productivity growth.

When labour productivity and MFP growth is decomposed by industry (figure 3)⁷ and weighted by industry size, the results show that two industries account for over 50% of the decline in labour productivity in the market sector. The accommodation and food services industry contributed the largest decline (0.9 percentage points), followed by the wholesale trade industry (0.8 percentage points). Both of these industries experienced strong increases in hours worked, likely reflecting post COVID-19 demand for transport, hospitality and tourism. Of industries where improved labour productivity was observed, the

⁷ Market sector MFP is decomposed using the experimental estimate of industry level multifactor productivity (ABS 2023), and market sector labour productivity is decomposed using ABS's method of decomposition of aggregate labour productivity (Wei 2012)

professional, scientific, and technical services and information, media, and telecommunications sectors together increased aggregate labour productivity by 0.5 percentage points.

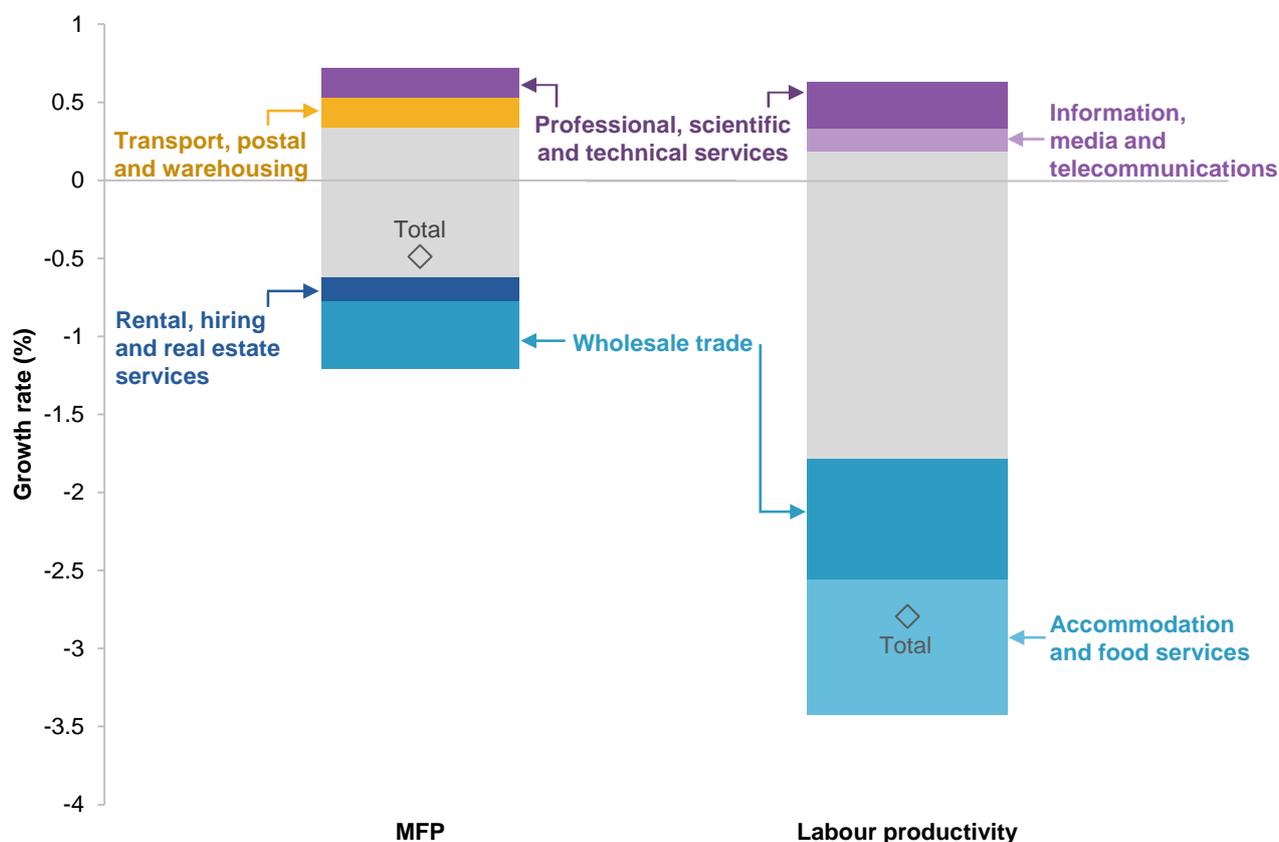
Table 2 – Industry productivity growth, hours worked basis, 2022-23^a

	Labour productivity %	MFP %	Hours worked %	Capital services %	Output (GVA) %
Market sector (16 industries)					
Professional, scientific and technical services	3	2.1	0.8	6.4	3.9
Agriculture, forestry and fishing	2.4	3.7	0.8	-0.9	3.2
Information, media and telecommunications	1.7	4.3	8.6	3.3	10.5
Other services	0.9	0.7	6.4	8.8	7.4
Administrative and support services	0.2	0.4	6.7	1.2	6.9
Manufacturing	-1	-1.3	0	0.8	-1.1
Transport, postal and warehousing	-1.2	3.3	15.7	3.9	14.4
Retail trade	-1.4	-1.4	2.8	2.8	1.4
Construction	-1.8	-0.8	5.7	2	3.8
Accommodation and food services	-2.3	2.3	24.5	1.6	21.7
Financial and insurance services	-2.6	0.3	4.1	-0.5	1.4
Mining	-4.1	-0.6	5.5	1.3	1.2
Rental, hiring and real estate services	-5.3	-3.9	6.1	3.4	0.5
Electricity, gas, water and waste services	-7.2	-4.3	8.6	3.1	0.8
Arts and recreation services	-10.2	-6.4	19.7	3.7	7.5
Wholesale trade	-11.4	-7.2	15.7	3	2.5
Non-market sector					
Education and training	-4.8	NA	6.7	NA	1.6
Health care and social assistance	-4.0	NA	8.2	NA	3.8
Public administration and safety	-3.6	NA	5.4	NA	1.6
All industries	-3.3	NA	6.9	NA	3.4

a. Some figures will not appear to add correctly due to rounding to one decimal place, for example labour productivity growth and hours growth not appearing to add to GVA.

Sources: estimates based on: ABS (2023, Australian System of National Accounts, 2022-23, Cat. no. 5204.0, tables 5 and 15); ABS (2023, Estimates of Industry Multifactor Productivity, 2022-23, Cat. no. 5260.0.55.002, tables 1 and 10).

The wholesale trade industry also contributed to the largest decline in market sector MFP (0.4 percentage points), followed by rental, hiring and real estate services (0.2 percentage points). The total MFP decline was partly offset by positive MFP growth, mainly driven by the professional, scientific, and technical services and transport, postal and warehousing industries, which together increased the total MFP by 0.4 percentage points.

Figure 3 – Decomposition of market sector MFP and Labour productivity growth**Growth in market sector MFP and labour productivity decomposed by industry, 2022-23**

Source: ABS (2023, Estimates of Industry Multifactor Productivity, 2022-23 financial year, 5260.0.55.002, tables 22 & 23).

3. Wage decoupling – an update

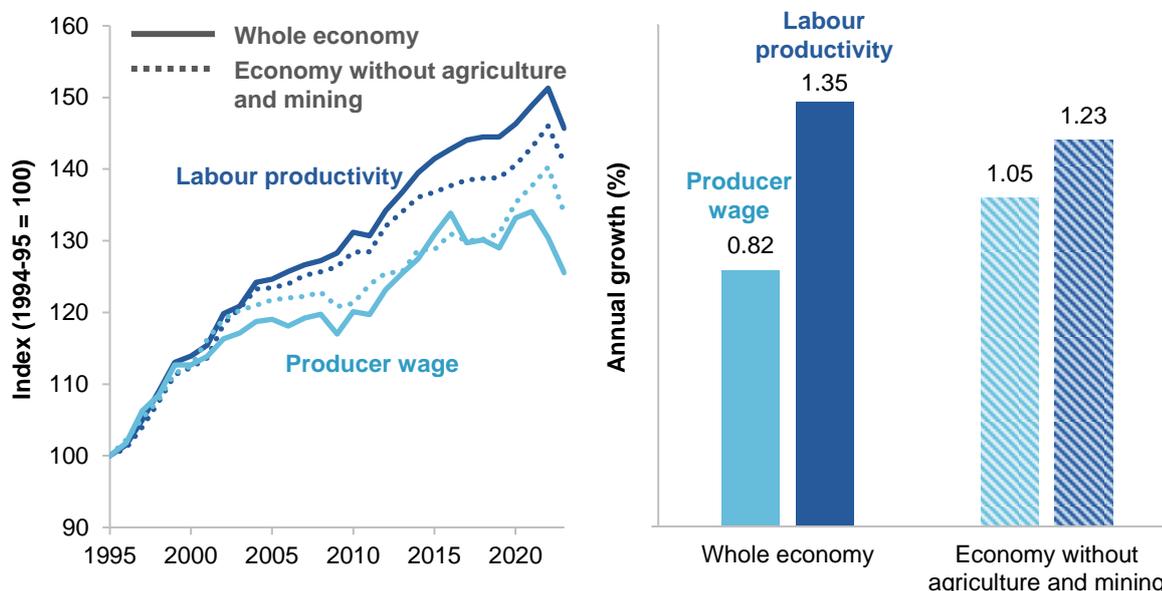
In 2023, the Commission released an analysis of productivity growth and wages (PC 2023b). The analysis (and accompanying technical appendix) presented a holistic picture of the relationship between real wages and productivity to determine whether growth in real wages departed from growth in labour productivity (referred to as wage decoupling).

This section provides an update on the link between real wages and productivity, particularly in light of the cost of living pressures experienced over the past 12 months. As a reminder, this analysis relies on producer wages (the wage costs producers face) as distinct from consumer wages (the purchasing power of the wages consumers receive) as the measure of wages. This is because businesses have control over the prices they set and wages they offer; but limited control over the prices people pay for other goods and services. Their capacity to pay wages depends on the prices they receive for their goods and services rather than the other prices consumers pay. While changes in the prices set by producers and the prices paid by consumers often track closely, there are reasons for them to diverge – in particular, due to the prices of imports, taxes, and subsidies.

Considering the economy as a whole, there is evidence that the growth in labour productivity exceeds growth in producer wages – a signal of wage decoupling. Wage decoupling across the economy is estimated to be 54 percentage points per year between 1994-95 and 2022-23 (figure 4). This is a slight decrease on wage decoupling estimated between 1994-95 and 2021-22 last year (56 percentage points).

Figure 4 – There is a gap between real wage growth and labour productivity across the whole economy^{a,b}

Producer wages and labour productivity between 1994-95 and 2022-23



a. The industries excluded are Mining and quarrying, and Agriculture, forestry and fishing. **b.** Methodology is in appendixes A and B.1 of PC 2023b.

Source: Commission estimates using: ABS (Australian System of National Accounts, 2022-23, Cat. no. 5204.0., table 46; Labour Account Australia, September 2023, Cat. no. 6150.0.55.003, industry summary tables; Labour Force, Australia, Detailed, December 2023, Cat. no. 6291.0.55.001., table EQ05; Consumer Price Index, Australia, Cat. no. 6401.0., table 1).

Given significant differences in labour use, capital use, methods of production and output across different industries, an aggregate view of Australia’s economy masks significant differences in wage and productivity growth within different industries. The original paper (PC 2023b) highlighted two sectors which exhibit strong wage decoupling: mining and agriculture. The sectors explain a large portion of the observed wage decoupling but account for only 5% of employment.

The mining and agriculture industries are unique as they are predominantly export-focussed industries. The terms of trade boom, fuelled by increasing commodity prices, experienced in Australia throughout the 2000s, and again since 2016, has increased producer prices (the prices Australian businesses receive for their output) relative to consumer prices (the prices Australians’ pay for their goods and services). Rising commodity prices depress real producer wages, driving a wedge between them and real consumer wages. As a rising terms of trade depresses real producer wages but has little direct effect on productivity – wages and productivity ‘decouple’.

Figure 4 highlights that if we strip out mining and agriculture, wage decoupling is much less pronounced. Over 2022-23, labour productivity fell by -3.5%, largely because of a sharp increase in hours worked. Real producer wages fell more (-4.6%) largely because of rising cost-of-living pressures. As the fall in real wages exceeded that of labour productivity, there was an increase in wage decoupling over the past 28 years, with productivity growth outstripping wage growth by 0.18 percentage points per year (up from 0.15 percentage points in 2021-22).⁸ Despite this uptick in decoupling, the underlying connection between labour productivity and wages remains intact, emphasising the importance of improving labour productivity to support a rebound in real wage growth.

⁸ Revisions to ABS data – in particular, an upward revision in gross value add – resulted in the wage decoupling estimate for 2021-22 being higher than the 0.12 percentage points reported in the previous paper.

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Appendix

This appendix contains supporting evidence for the 2024 Productivity Bulletin.

A primer on productivity

What is productivity?

Productivity measures the rate at which output of goods and services are produced per unit of input. It is calculated as the ratio of the quantity of output produced to some measure of the quantity of inputs used. Many factors can affect productivity growth such as: technological improvements, workforce skills, changes in other inputs (such as capital), competitive pressures and the business cycle.

What are the main measures?

Two metrics are commonly used to measure aggregate productivity. **Labour productivity** is the ratio of output to hours worked. Output is typically defined as gross value added (the total value of a firm's production minus intermediate inputs). **Multifactor productivity** (MFP) is the ratio of output to a combined input of labour and capital. It is generally considered to be a better measure of technological change and efficiency improvements than labour productivity.⁹

This bulletin does not include multifactor productivity because it is not included in the quarterly national accounts.

What parts of the economy are we measuring?

The most accurate estimates of productivity are for those industries where prices are set in markets – known as the 'market sector' – and where it is therefore easier to measure output (in terms of real industry gross value added). This Bulletin provides estimates for the 16 market sector industries and the 3 non-market sectors industries.¹⁰

⁹ Usually, the growth in labour productivity exceeds the growth in multifactor productivity. The difference between the two is the contribution from 'capital deepening'.

¹⁰ Labour productivity can also be measured for the whole economy (in terms of real GDP per hour worked). Labour productivity measured in this way contributes to growth in living standards but is a poorer indicator of technological change and efficiency improvement because of the difficulty measuring output in health, education and public administration.