Productivity in the Real World:

What it is, what it isn't, and how to make it work better for workers

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Summary

There has been a renewed emphasis on the problems and prospects of productivity in Australian economic debates in recent months. Some commentators express alarm about a "crisis" in productivity growth, arguing that Australians' future prosperity is in jeopardy without urgent action to "fix" the productivity problem. This alarmism is overstated. To be sure, recent productivity performance has been disappointing. But is does not mean Australians have lost the capability or the desire to work efficiently and productively. And low productivity is not the source of the concrete challenges in incomes and living standards that Australian workers have experienced in recent years (like falling real wages, high interest rates, and high costs for essential purchases like housing, food, and energy).

To some extent, recent productivity sluggishness reflects unique disruptions associated with the dramatic events of the COVID pandemic and its aftermath. Most other industrial countries have also demonstrated unusually weak productivity trends during this time, so Australia's experience is not unique. However, even before the pandemic struck, Australia's productivity growth trajectory was weakening. This report identifies several key factors contributing to that longer-run slowdown, including:

- Persistently weak business investment in capital, machinery and equipment, and innovation. Australian businesses invest half as much in machinery and equipment (relative to GDP) as they did during the productivity-boosting postwar era, and they invest less than half as much in R&D as the average of other OECD countries.

- A regression in the average capital intensity of production in Australia (and an unusual decline in the aggregate ratio of capital to labour employed). Capital intensity declined by 5% between 2021 and 2024, reducing the average stock of capital employed per worker by $30,000.

- Underinvestment in the public capital stock, including transportation, energy, and communications infrastructure.

- Failures in Australia's skills and training system (most painfully arising from misguided experiments in privatised but publicly-subsidised vocational education), reflected in a sharp decline in the proportion of Australia's workforce completing vocational training.

- Chronic macroeconomic weakness and underutilisation of labour (which undermines the incentive for businesses to invest in labour-saving technologies).

- Gaps in labour standards and industrial rules, which allow businesses (such as digital platforms in passenger, food, and package delivery) to access labour cheaply.

Many productivity "true believers" assert that higher productivity will fix virtually everything in society: producing higher wages, stronger public programs, shorter working hours and more leisure time. This naïve faith that higher productivity automatically trickles down, to be shared by all workers, is unfounded.

This report presents empirical evidence showing that productivity growth in recent decades (disappointing as it may have been) has not been equally reflected in higher real wages and better living standards. Productivity grew four times faster since 2000 than average wages adjusted for consumer prices; it grew almost twice as fast as average wages adjusted for producer prices. If workers had received wage increases since 2000 that matched productivity growth, wages would be as much as 18% higher than they are at present – worth $350 per week, or $18,000 per year. Over time, that failure of wages to keep up with productivity has created a "productivity debt" effectively owed to workers, worth hundreds of thousands of dollars per worker.

The fruits of productivity growth have been disproportionately captured in the form of business profits, dividend payouts, and executive compensation.

Only through deliberate, forceful measures to ensure that productivity growth is reflected in improved compensation and conditions for workers (through stronger labour standards, stronger Modern Awards, and broader collective bargaining) can Australian workers have any confidence at all that their contributions to improved productivity will pay off in better lives for them. That did occur during the initial postwar decades (until the 1980s), when strong productivity growth was closely tied to strong growth in real wages, reduced working hours, and improved public services and programs. Repairing the link between productivity and mass prosperity, by strengthening the institutions of distribution and *pushing* wealth downward (rather than hoping it will trickle down automatically), is as important to Australia's future productivity as any labour-saving technological breakthrough.

The report concludes with a broad agenda of high-level policy themes that should be pursued to challenge and support Australian workplaces to become more productive – and to ensure the resulting gains are broadly shared. This agenda is summarised in Table 1.

Table 1 Strategies to Revitalise Productivity Growth, and Share its Proceeds
Boosting investment and innovation
Building a more diversified, balanced, sustainable economy
Investing in people and skills
Enhancing physical and social infrastructure
Valuing labour… and paying for productivity
Reductions in working hours

In a mostly private-sector economy like Australia's, productivity is first and foremost the responsibility of private profit-seeking businesses. They are the ones paid to organise production efficiently and innovatively. The failure of Australian businesses to fulfil this role – including their underinvestment in capital, technology, and skills – is the major cause of Australia's productivity underperformance. Blaming government, taxes, regulations, or unions for the problem (as business lobbyists are once again doing) is a diversion from the true problem. Record-high business profits in recent years confirm that Australia's business community has ample resources to do a better job. They need to be pushed and challenged, as well as supported and nurtured, to make a stronger contribution to future productivity growth.

Current challenges in Australian living standards (including a precipitous decline in real wages, adjusted for inflation, since the COVID pandemic) were not caused by poor productivity. And stronger productivity growth is not a cure-all for all that ails Australia's economy. If done right – by valuing and investing in work and workers, rather than degrading and cheapening labour – stronger productivity growth has the potential to underpin future prosperity. To achieve that, it must be paired with active measures to fairly and fully share the gains of productivity growth throughout society: via higher real wages, better conditions, stronger public services, and reduced working hours. That's a productivity vision for the real world – one that working people can get behind.

Introduction

Conventional economics puts great emphasis on productivity growth as the key to economic progress and a high quality of life. Nobel Prize Economist Paul Krugman famously put it this way:

> Productivity isn't everything, but in the long run, it's almost everything. A country's ability to improve its standard of living over time depends almost entirely on its ability to raise its output per worker.[1]

Closer to home, the former Governor of the Reserve Bank of Australia, Phillip Lowe, paid tribute to the multiple powers of productivity growth in his farewell address (as he retired from that role in 2024):

> Productivity growth is central to our future prosperity. It means rising living standards, higher real wages, a lift in our collective wealth, a bigger pie to help finance the public services the community values and less inflation pressure. It makes most things easier.[2]

Australia's newly-minted Assistant Minister for Productivity, Andrew Leigh, is just as enthusiastic about the multi-faceted virtues of productivity growth:

> Productivity… is the engine of living standards… It's what pays for aged care and renewables, for better schools and bigger ideas. It's what makes room – fiscal and social – to build a more generous, more imaginative society.[3]

It seems that productivity growth is an amazing magic bullet that can cure virtually everything that ails the economy: delivering higher wages, better lives, stronger public services, and lower inflation. What's not to like?

Interest in productivity policy has expanded since the COVID pandemic, sparked by unusual trends in productivity statistics. Traditionally, measured productivity grows a little bit each year – as workplaces apply new technologies, workers gain more training and skills, and the types of products and services we produce become more complex

[1] Paul Krugman, *The Age of Diminished Expectations: U.S. Economic Policy in the 1990s* (Cambridge MA: MIT Press, 1997), p.11.

[2] Philip Lowe, "Some Closing Remarks," Anika Foundation, Sydney, 7 September 2023, https://www.rba.gov.au/speeches/2023/sp-gov-2023-09-07.html.

[3] Andrew Leigh, "The Progressive Productivity Agenda," 25 June 2025, McKell Institute, Sydney, https://www.andrewleigh.com/speech_the_progressive_productivity_agenda.

and valuable. But curiously, productivity seemed to surge during the first year of the pandemic (when workplaces in many industries shut down entirely). It then plunged when the economy re-opened. And despite recent improvements, productivity still has not regained its pre-pandemic trend.

This strange pattern (shared by most other industrial countries) has generated exaggerated claims that Australia faces a "productivity crisis". Several factors have contributed to post-pandemic fluctuations in productivity (discussed further below), and economists are studying this phenomenon further. But the common assertions that Australians have somehow lost the will to work hard, or forgotten how to work efficiently, or have become so burdened by government red tape and union rules that their efficiency is crumbling, are not credible. Productivity is the long-run outcome of numerous interacting and structural forces; it has virtually nothing to do with worker effort, industrial rules, or which political party is in power.

Indeed, employers and conservative politicians routinely play the "productivity card" to justify anything that cuts costs and boosts profits – and to disparage anything business doesn't like. Executives call for wage cuts, tax cuts, deregulation, offshoring, or deunionisation, always claiming that productivity will improve – and the benefits of productivity will then "trickle down" to lift everyone's quality of life. Both parts of this argument are false: none of those actions improve true productivity,[4] and even if they did there's no guarantee workers would ever get a share of it.

Some of these claims verge on the ridiculous. Former opposition leader Peter Dutton promised to tear up Australia's new right-to-disconnect laws on grounds that they hamper productivity – as if allowing employers to call their staff any time of the day, any day of the week, somehow makes them more efficient. Liberal Senator Angus Taylor denounced labour relations reforms for causing an "unprecedented collapse in labour productivity in this country."[5] Liberal Senator Simon Birmingham even blamed expanded childcare benefits for the crisis in productivity, since they allow parents "to play golf or attend a Pilates class" instead of going to work.[6]

In short, "productivity" has become an excuse for vested business or political interests to demand whatever they wanted in the first place. To separate self-serving rhetoric

[4] A helpful review of past promises of how business-friendly policies would "fix" productivity, but failed to do so, is provided by Richard Denniss and Matt Saunders, "Treasury Says: Productivity Matters, but Coalition Policy Doesn't" (Canberra: The Australia Institute, 2021).

[5] Australian Associated Press, "Coalition would overturn right-to-disconnect legislation, Peter Dutton says," *The Guardian*, 11 February 2024.

[6] Simon Birmingham, "Labor's universal childcare plan feels more like vote buying than evidence based policy," *The Nightly*, 10 December 2024.

from real-world reality, Australians need a better understanding of what productivity is, and what it isn't. That will help them evaluate competing claims and promises and make up their own minds about what would help productivity – and whether productivity even matters in their own lives.

The current moral panic about productivity is all the more ironic given widespread (and equally overstated) public and policy concerns about the supposedly imminent displacement of mass numbers of workers as a result of technological change – through things like automation, robots, and artificial intelligence. Careful analysis has shown these developments are unlikely to translate into widespread job displacement (although specific industries or occupations can certainly be disrupted by new technologies). We will show below that Australia's problem is not too much technological innovation, but not enough.[7] If technology was indeed having such profound and disruptive impacts on employment as feared in many accounts, productivity growth would accelerate dramatically: by definition, producing more output with less workers means higher productivity. But in reality, the reverse has occurred. Investment in new technology has slowed down, not sped up. And productivity growth has slowed in tandem.

This report reviews several aspects of the productivity puzzle, in hopes of contributing to a more complete and balanced understanding. We will explore what productivity is, why it matters, why productivity growth has been relatively weak in recent years, and what can be done to improve it – not for its own sake, but as part of an all-round effort to make work, living standards, and society better.

Part I of the report defines productivity, dispels some myths about this often-misused concept, and explores how to measure it. Part II reviews Australia's recent productivity performance, in comparison to past periods of history and international experience. It also explores several factors (including disruptions from the COVID pandemic) that affected recent productivity performance – none of which are related to Australians' purported "work ethic", industrial rules, or taxes.

Part III considers in more detail the imperfect relationship between productivity and wages. The standard assumption that higher productivity is automatically and naturally reflected in higher wages is shown to be false. Australian historical data, and comparative international data, both confirm that the relationship between productivity and wages is weak and imperfect. Instead of trusting rising productivity to lift all boats, deliberate strategies and policies are needed to ensure workers receive a

[7] For a more fulsome review of the non-impact of technology on recent employment levels, see Jim Stanford, *The Robots are NOT Coming (And Why That's a Bad Thing)* (Canberra: Centre for Future Work, 2020).

fair share of productivity gains. And far from interfering with productivity (by "tying the hands" of supposedly efficient bosses), strong labour protections and collective bargaining arrangements actually enhance productivity: they push employers to use labour efficiently (rather than treating it as a throwaway, just-in-time input), and they ensure workers benefit from productivity growth (thus strengthening their engagement with genuine productivity-enhancing strategies).

Finally, Part IV proposes a high-level catalogue of broad strategies to improve Australia's productivity performance, but in ways that simultaneously ensure the benefits of productivity are fairly and broadly shared. These include strengthening private and public investments in machinery, technology, and research; investments in skills and lifelong training; maintaining the economy at or near full-employment (to capture the productivity benefits of full utilisation); and investing in physical and social infrastructure to make work more accessible and efficient.

At the end of the day, productivity involves valuing, protecting, and supporting work – and the workers who perform it. Ultimately, productivity cannot be improved by cheapening labour, intensifying work, or further empowering bosses. And without strong policies to ensure a growing pie is divided fairly, productivity growth itself means nothing to workers.

In short, anyone who says workers must tighten their belts and make do with less, all in the interests of productivity, is lying. Tightening belts has no relationship to productivity, properly measured. Workers *can* benefit from productivity growth, *if* it is achieved by uplifting and investing in workers, and *if* it is just one part of a broader commitment to inclusive growth. This report proposes a productivity program to do exactly that.

Part I: What is productivity, anyway… and does it even matter?

Discussions of productivity are regularly dominated by misleading and self-serving claims of employers and business lobbyists, who see an opportunity to push for more austerity, tax cuts, deregulation, deunionisation, and privatisation. That's why it's so important to start with the basics, to sort out economic reality from business misinformation. This section will discuss what productivity is (and what it isn't), discuss how it is measured, and consider whether and how it matters in the concrete lives of working people, their families, and communities.

WHAT IS PRODUCTIVITY?

In the most general understanding, "productivity" simply refers to how efficiently an economic activity converts the various inputs and resources it uses, into the final product or service which it produces. It measures how well a business or workplace or economy produces goods and services, relative to the various inputs (like time, effort, money, materials, energy) used up in production.

Measuring productivity thus requires keeping track of both the outputs of an operation, and the inputs used to make it run. Productivity is not measured by the total output of a business or workplace. Rather, it depends on that output *relative to the inputs* used up in the course of production:

$$Productivity = \frac{Output}{Inputs}$$

The numerator (top) of this simple formula shows how much is produced by a workplace, company, industry, or economy. The denominator (bottom) measures how much was used up in that production. Higher productivity means the operation is getting "more bang for the buck": transforming inputs into outputs more efficiently. It does not necessarily mean producing *more*; it means producing *more efficiently*.

Every workplace or industry needs many different inputs to function. First and foremost, of course, it needs people: the workers who perform all the various tasks needed in the course of production. Because labour is central to every production process – and because the ultimate point of the economy is to ensure a decent

standard of living for *people* – we are therefore most concerned with measuring *labour productivity*.

That's why the most common measure of productivity is labour productivity, which measures how much output is produced, per unit of labour input. Labour input is typically measured in *time*: an hour of work, or a year of work, for an average worker in a workplace, an industry, or the whole economy.

$$Labour\ Productivity = \frac{Output}{Work}$$

Instead of simply counting total hours of work, some researchers try to construct synthetic measures of labour input that purportedly take account of the "quality" of labour (for example, how much education the typical worker has received). However, that is both complicated and controversial.[8] It is both simpler and more honest to simply measure how much work time goes into production. To be sure, investing in skills and training (as discussed below) is an important way to improve productivity, by enhancing the capacities of workers. But it is not appropriate to assume that a highly-educated worker is somehow worth more than someone without formal qualifications (as implied by a focus on so-called "quality-adjusted" employment data).

WHAT PRODUCTIVITY IS NOT

Unfortunately, the idea of productivity is often manipulated by employers or politicians trying to trick workers into working harder, for less money. Business leaders always have a long wish list ready of things they claim would improve Australia's productivity: like cutting wages and weakening labour protections or cutting taxes and government regulations. Most of these demands have nothing to do with productivity, properly measured. To the contrary, many would more likely *reduce* true productivity. Here are some example of misleading business arguments about productivity:

Productivity does not mean working longer: If someone works for ten hours a day instead of eight (25% longer), they might produce 25% more output. But they worked 25% more hours, so their productivity per hour hasn't changed. In fact, since they were probably very tired during those extra hours, their productivity likely *declined*. The

[8] The point of measuring "quality-adjusted labour inputs" is usually to try to separate the impact on production of "pure" (unskilled) labour from the impact of skills and knowledge (which conventional economics treats as human "capital", rather than as skilled labour). But skills are hard to measure; moreover, this approach usually underestimates the amount of skill and on-the-job training required to perform jobs that do not require formal educational qualifications. For these reasons, it is preferable to simply measure labour in units of time.

same applies for other ways employers try to lengthen the work day: for example, by demanding workers stay late (often working unpaid overtime[9]), working through lunch, or cutting out breaks. Squeezing extra work time out of the workforce might increase total output (the numerator of the productivity equation) a bit – or it might not. But it also increases labour input (the denominator), so the impact on productivity is non-existent (or perhaps negative, again due to the effects of fatigue on workers).

Peter Dutton made this mistake when he pledged to eliminate Australia's new right to disconnect law, which he claimed undermines productivity. In fact, by ensuring that workers have ample opportunity for rest and personal and family maintenance, and requiring businesses to properly plan regular worktime for maximum efficiency (rather than counting on extra time after hours to get the job done), right-to-disconnect rules can improve productivity.[10]

Rather than equating productivity with working longer, an important potential benefit of true productivity growth is that it could allow people to work *less*, while enjoying the same or improved real incomes. As considered below, workers' share of productivity gains can in theory be divided between higher real wages and shorter working hours (although as stressed below, neither of those benefits flow to workers automatically). If workers produce more with each hour of work, they could conceivably work less (via a shorter work day, a four-day work week, longer annual leave, other leaves, and/or earlier retirement) while maintaining constant or improved real incomes. This benefit does not accrue automatically: as workers have learned over the centuries, the demand for shorter working time needs militant advocacy and collective action, in order to win shorter working hours from reluctant employers. Nevertheless, the potential synergies between higher productivity and shorter work time – reinforced by the superior productivity of workers who are balanced and well-rested – is an important motivation for a worker-friendly productivity program.

Productivity is not ultimately improved by working 'harder': Similarly, trying to boost productivity by intensifying or speeding up work is also a dead end. Employers regularly try to squeeze every possible minute out of the work day – by speeding up assembly lines, using digital surveillance techniques to monitor and discipline work

[9] Survey data collected for the Centre for Future Work's annual "Go Home on Time" project estimates that the average Australian worker performed 188 hours of unpaid overtime in 2024, worth an aggregate total of $92 billion across the whole labour market. See Fiona Macdonald, *Taking up the Right to Disconnect? Unsatisfactory Working Hours and Unpaid Overtime* (Canberra: Centre for Future Work, 2024).

[10] Jim Stanford, "The big error at heart of 'right to disconnect' opposition," *The New Daily*, 14 February 2024.

pace,[11] or demanding that workers meet unreasonable production targets.[12] It might seem that cracking the whip over workers can lift hourly productivity, but these gains are superficial and ultimately unsustainable. There are limits to how far humans can be pushed without encountering severe risks to physical and mental health. Resulting injuries and stress can lead to lost work time and underperformance down the road – losses typically ignored by short-term productivity statistics. To be sure, making sure normal work assignments are performed in an efficient and sustainable manner, within normal allotted time periods, is a prerequisite for good productivity. But work intensification only goes so far. Lasting improvements in productivity can only be achieved with more fundamental improvements in work and production: like using new technology to produce more output with less work time, or product improvements that increase the quality and value of output (rather than just the quantity).

Productivity does not mean working for lower wages: Employers often try to disguise reductions in wages or other forms of compensation as "productivity" initiatives. But labour costs do not even enter the productivity equation. Remember, productivity measures the *quantity* of output divided by the *labour time* required to produce it. Neither of those variables are directly affected by workers' pay. So, while reducing wages or other labour costs (like superannuation contributions) might enhance a company's *profitability*, it has no direct impact at all on *productivity*. Of course, there are indirect ways in which wages can feed back on productivity. Economic research has shown that improved compensation can motivate workers to perform better, and also reduces labour turnover (which hurts productivity due to the time and cost of replacing departing workers). This effect is often called the "efficiency wage": if employers pay higher wages, they can generate productivity gains that offset some or all of the costs of those higher wages.[13] Moreover (as discussed further below), higher wages provide an immediate incentive for employers to improve work processes or introduce new technology in order to reduce direct labour requirements.

[11] For more on the misuse of digital technology to monitor and discipline workers, see Troy Henderson and Jim Stanford, *Under the Employer's Eye: Electronic Monitoring & Surveillance in Australian Workplaces* (Canberra: Centre for Future Work, 2018).

[12] An example is the unreasonable work pace requirements imposed by Amazon on its warehouse workers, which have been documented to result in shocking incidence of workplace injuries; see United States Senate, Health, Education, Labor and Pensions Committee, "Peak Seasons, Peak Injuries: Amazon Warehouses Are Especially Dangerous During Prime Day and the Holiday Season—and the Company Knows It," 15 July 2024, https://www.help.senate.gov/imo/media/doc/help_committee_amazon_interim_report.pdf.

[13] For a classic summary of efficiency wage theory, see George Akerlof and Janet Yellen, eds., *Efficiency Wage Models of the Labor Market* (Cambridge: Cambridge University Press, 1986).

Productivity is different from 'cost-cutting': In addition to cutting wages, employers always pursue other measures to cut operational and production costs. These efforts could include finding cheaper premises, cheaper sources of raw materials and inputs, strategies to reduce tax liabilities, or shifting production to cheaper locations (or even other countries). Like wage cuts, these efforts might improve a business's profitability, but they have no direct impact on productivity. And in some cases, cost-cutting can backfire for true productivity – by contributing to unreliability or lower quality in supply chains or production facilities. Productivity and profitability are distinct and different. Employers and business lobbyists intermingle these concepts, but it's important to keep them separate.

Productivity is not improved by outsourcing: One specific form of cost-cutting popular with employers is to hire outside contractors or suppliers to perform work previously done in-house. This is especially attractive if they can access outsourced labour more cheaply or flexibly than paying their own staff: for example, by shifting work to underpaid gig workers, small external suppliers, or suppliers in other countries. Once again, this may boost profits for the company but has no clear impact on true productivity. Shifting work from in-house to external contractors doesn't reduce the work, it only disguises it: output per hour of *in-house work* might increase, but output per hour of *total work* (including contractors) doesn't change, or may even increase. Meanwhile, the extra time and trouble of arranging for external suppliers, and problems of reliability and timeliness that often accompany outsourcing, can undermine genuine productivity.

Productivity does not necessarily mean producing "more": A factory does not necessarily become more productive just because it increases its total output. It all depends *how* the output was increased. If the factory operated 24 hours per day instead of 12, or doubled its size and its workforce, it could produce more total output. But the input of labour also doubled – so there is no improvement in productivity. In fact, in some cases trying to produce too much from a given operation can reduce productivity – by causing bottlenecks or overcrowding the workplace.

On the other hand, in some industries productivity does increase when workplaces get bigger, through a process called *economies of scale*. By dividing initial set-up and overhead costs (including the work time required for those tasks) across a bigger volume of output, output per hour improves. Productivity can thus increase from concentrating production in larger operations. However, that must be weighed against the dangers of corporate concentration in industries dominated by very large companies (whose size gives them undue power to set prices and exploit both consumers and workers). A recent example has been the process of corporate concentration in the retail sector, with small stores being crowded out by the growth

of big-box retailers and online delivery-based retailing. Productivity in retailing has improved, but in a way that damaged local businesses and competition, with negative effects for consumers and communities.

In the extreme, in some industries (called *natural monopolies*) productivity is optimised when just one, or a very few, suppliers are in business. In this case, the public interest must be protected through close regulation of large firms, or preferably through public ownership – so that the benefits of higher productivity arising from centralisation can be captured for the public, rather than private owners.

WAYS TO MEASURE PRODUCTIVITY

The most common and important productivity measure is *labour productivity*: how much is produced from each unit of labour input. This is the most straightforward way to measure productivity, since we can count the number of workers assigned to a task, and the number of hours they work. Labour productivity is also the most relevant for understanding the relationship between productivity and living standards. After all, it is human beings who ultimately produce value-added. And the purpose of their work is to support themselves and their families at a decent standard of living. So, measuring the efficiency of human labour – the human element in production – is inherently the most relevant indicator of productivity.

It is possible to measure productivity with reference to other inputs to an operation – such as capital, machinery, land, or energy. Examples include measuring output per hectare on a farm, or the amount of sales per dollar of assets invested in a business, or the quantity of GDP produced in the economy per petajoule of energy consumption. These measures can be useful in specific settings: to help managers track performance of their particular businesses, or to address certain economic or environmental issues (such as greenhouse gas emissions from the economy).

Orthodox economists have developed an alternate (but very misleading) measure of productivity, called total factor productivity (TFP) or multifactor productivity (MFP). The idea here is to try to capture the nebulous impact of management quality and entrepreneurship on how various inputs (labour, capital, energy) are combined in an operation. There is no direct way to measure this supposed impact. Statisticians try to capture how much production grows in response to changes in the quantities of labour, capital, and other inputs. Anything left over is then assumed to reflect the entrepreneurial genius of firm management, who have learned to more efficiently combine inputs into outputs.

There are many problems with this approach, in both concept and measurement. It effectively discounts the impacts on productivity of capital accumulation. Working with modern machinery and equipment predictably makes workers more productive: that's the whole point of using ever-more-advanced tools in our work. But instead of viewing this as good and efficient, the TFP approach ascribes it to a mere process of accumulating capital (known as "capital deepening"), implying it doesn't count as true productivity. And since TFP can only be estimated by what's left over after trying to account for changes in the quantity of all other inputs, it is very unreliable as a measure. Statistical models that underestimate the true impacts of workers, skills or capital on output generate more "unexplained" residual – which is then attributed to the marvelous abilities of firm managers. These TFP-based measures have little real-world relevance.[14]

Labour productivity is the best way to judge the economy's capacity to generate goods and services for *people* – which is the ultimate goal of the economy. As will be explored below, there is no automatic link between labour productivity and the well-being or living standards of the people generating that productivity: it all depends on how productivity is attained, and how its fruits are distributed and used. But for measuring the *potential* of the economy to provide for good living standards, labour productivity is the most appropriate concept.

In turn, there are various methodologies for measuring labour productivity. In the numerator, output can be measured in physical quantities, or in aggregate value terms (dollars). Physical output measures are useful for specific industries, where output is homogeneous and easy to measure: tonnes of iron ore mined per worker, for example, or the number of coffees served per day per barista.

However, for comparing productivity across different industries, or measuring it across the whole economy (which produces thousands of different products and services), only value measures are meaningful. The output of different industries (or different products produced within a given industry) must thus be converted to dollar values, in order to track combined economic output and then compute productivity. This is not straightforward: it depends on which prices are used, how changes in price levels (inflation) are measured and accounted for, and (for international studies) how different currencies are compared.

[14] A useful overview of problems in TFP methodologies is provided by Fred Block, "Technology and productivity: a critique of aggregate indicators," *Journal of Post Keynesian Economics* 45(1), pp. 1-23, 2022.

PROBLEMS IN MEASURING PRODUCTIVITY

Given these statistical and methodological issues, there is great uncertainty in properly measuring productivity, and interpreting its trends. Some of this uncertainty arises inherently from the complex combination of measures which all go into estimating productivity.

Recall, labour productivity is calculated as the ratio of two composite variables (total real output and total hours worked). Those two variables themselves depend on other moving parts: nominal output and average prices, for the numerator, and total employment and average hours of work, for the denominator. Each of these components is subject to significant measurement error, and those errors can be magnified when combined into a composite measure of productivity.

This in turn leads to frequent revisions in productivity estimates. Statistical agencies regularly update and correct past estimates of productivity and its various component variables. The Productivity Commission has reviewed the tendency of productivity estimates to be revised, in many cases several times over – with no convergence around "true" values.[15] Productivity is thus reminiscent of Melbourne's weather: if you don't like a particular reading, wait an hour and it will probably change! For this reason, apparent productivity trends need to be interpreted cautiously, especially those seeming to show sudden or short-run changes. This is an important caveat to current concerns about unusual trends in productivity since the COVID pandemic; it is quite possible that recent weak productivity data will be revised in future statistical releases.

Beyond the general uncertainty surrounding productivity statistics, there are several other conceptual and measurement challenges that must be considered, before taking any productivity statistics at face value:

What is 'Value'? To measure productivity in anything other than physical units, the various outputs of the national economy must be valued according to some comparable standard of measurement. In private businesses (which account for about 85% of economic output in Australia) production is measured at its "market value": that is, the prices which businesses charge for their products or services. Of course, it can never be assumed that a product's *price* reflects its true *value*. Prices don't take into account side-effects of production (like pollution, congestion, or safety concerns) that can damage society or the environment (these side-effects are called *externalities*).

[15] Productivity Commission, *Quarterly Productivity Bulletin*, September 2024, p. 5.

Similar problems are encountered in measuring GDP, which is itself a misleading indicator of economic progress. By excluding externalities, excluding things that are not sold for money (like unpaid labour), and valuing things that are sold but are useless or even destructive (like advertising, gambling, or weapons), GDP is a deeply flawed measure. By definition, therefore, measuring labour productivity by GDP per hour must have the same flaws: it includes some things that are useless or inefficient, and excludes other things that are important and valuable but have no market "price" (like unpaid labour, environmental quality, or leisure time).

Adjusting for Inflation. In general, we are interested in "real" productivity, which adjusts estimates of value-added to control for the effects of inflation. The nominal value of output might rise simply because prices were higher – but that does not show that production grew or the economy became more efficient. In most applications, therefore, labour productivity is adjusted for inflation: stripping out the effects of price increases and converting prices to some arbitrary base year in order to capture true changes in quantity. It is hoped that this will give a better measure of true efficiency.

However, it is difficult to measure these broader changes in prices, and properly adjust output and productivity measures accordingly. For example, most aggregate price indexes cannot fully measure the impact of quality changes, and hence tend to underestimate the true value of output (and simultaneously underestimate productivity). And in some cases (such as understanding business decision making), it is nominal values which are more relevant – since businesses are interested in maximising profit, measured in dollars, not any abstract index of productivity.

Public and not-for-profit output: In the private sector, output is valued according to its market price – and this approach flows through into measures of business productivity. In the public and not-for-profit sectors, however, this doesn't work, because the goods and services (mostly services) they produce (like public education, public health care, and public administration) are not sold in a market. Rather, they are provided to consumers (residents or service users) on some other basis: sometimes free, sometimes with partial user charges that have no necessary connection to the cost of production (such as public transit fares or tuition fees).

As a second-best method of valuation, statisticians generally assume that the *value* of a public service equals its *cost* of production: including labour costs (which make up most of the cost of public services), capital, and other inputs. This approach creates many problems, both conceptual and ideological. Since the value of the output equals

the cost of its inputs, it is hard by definition to improve aggregate productivity.[16] The quantity of output may grow if a public service expands, but so does the cost of its inputs, and hence the ratio of the two may hardly change. By the same token, some innovation that allows a public service to become genuinely more efficient would also reduce its cost of production – which thus reduces the numerator of the productivity equation as well as its denominator. Since output is valued at its cost, productivity gains are not fully captured.

This gives rise to the misleading conclusion that productivity growth in the public sector is inherently slow. Claims by business groups and conservative politicians that the public sector "drags down" overall productivity are false, based on ideological bias as well as this statistical oddity. In fact, as will be discussed below, by equipping all workers (including in the private sector) with the capacities (skills, health, mobility) to do their jobs well, public services definitely enhance overall productivity across the economy. Nevertheless, because of the difficulties in measuring public sector productivity, and the growing importance of public sector work in overall employment in Australia,[17] it is likely that conventional productivity statistics underestimate genuine productivity growth in the overall economy.

Quality versus quantity: Many analysts tend to focus narrowly on quantitative measures of output, without taking proper account of the quality being delivered. In part this is because it is harder to measure quality than quantity – all the more so given the challenges (discussed above) of adjusting output measures for inflation. However, a single-minded focus on quantity leads many productivity advisors to emphasise speeding up assembly lines, cutting out breaks, and intensifying work: so operations can produce more output (and more profit) per worker. But these efforts to boost quantity of output through more intense work practices are limited by the realities of endurance and sustainability. More often than not, they lead to problems that

[16] Problems in measuring output and hence productivity in the non-market sector are discussed by Australian Bureau of Statistics, "Non-market output measures in the Australian National Accounts: a conceptual framework for enhancements, 2020," 31 August 2020, https://www.abs.gov.au/statistics/research/non-market-output-measures-australian-national-accounts-conceptual-framework-enhancements-2020; and Australian Bureau of Statistics, "Interpreting ABS productivity statistics," 13 December 2023, https://www.abs.gov.au/articles/interpreting-abs-productivity-statistics.

[17] Since 2019, three mostly public-sector industries (health care, education, and public administration) have accounted for 53% of all net new employment in Australia; calculations from Australian Bureau of Statistics, Labour Force, Australia, Detailed, Table 4. The fact that over half of new employment has been located in industries for which productivity estimates are artificially and unreliably low, casts further doubt on the validity of pessimistic conclusions regarding productivity growth in the overall economy.

interfere with true productivity (such as quality defects or repetitive strain injuries for workers).

This problem is particularly acute in public or human services, where quality of care is central to the very motivation for the work. Simplistic productivity thinking might indicate that productivity in schools (measured by students taught per teacher) could be increased by larger class sizes, or that productivity in hospitals (measured by patients treated per nurse) could be increased by reducing medical staffing. Of course, true productivity in those services must be measured by the effectiveness of the service: genuinely educating students and healing patients. That is undermined, not enhanced, by understaffing or overcrowding. Genuine productivity in human services can be improved through many channels, such as better administration, investing in technology that enhances the hands-on work of staff, or eliminating bottlenecks or waste. But all this requires deeper dives into the details of how these services can be better organised, rather than obsessing about cutting staff levels and boosting simplistic KPIs (like students per teacher or patients per nurse).

Even in private sector settings, the trade-off between quality and quantity of output can produce misleading productivity statistics. Here is a recent example: measured real labour productivity grew 15% in limited-service restaurants in the U.S. during the COVID pandemic, and then stayed high. This seems like a productivity success story. But on careful examination, it turned out that almost all of the improvement in productivity was due to a reduction in the average amount of time spent by customers in restaurants. The proportion of customers spending less than ten minutes in restaurants (reflecting the growing dominance of take-out and food delivery) reached 60% of all visits following the pandemic. In reality, therefore, what seemed like a productivity surge was in fact a step change in the nature of restaurant dining (namely, a big shift from dining in to take-out).[18] This is not evidence of genuine productivity growth; it is, rather, evidence of a shift to lower-quality mass consumption. Similar concerns exist regarding apparent productivity improvements in retail services, transportation, and other services: what looks like “productivity” can turn out to reflect inferior service or overcrowding, reflecting businesses’ drive for profit, not genuine efficiency.

Productivity and the environment: In addition to human labour, another fundamental input required for all production are resources harvested from nature. These include raw materials (like minerals, forestry products, and agricultural commodities), as well as basic ecological benefits (like land, water, and air). Unfortunately, conventional

[18] See Austan Goolsbee, et al., “The Curious Surge of Productivity in U.S. Restaurants,” National Bureau of Economic Research Working Paper #33555, March 2025.

economic statistics (like GDP) do not take proper account of the value of these environmental inputs – nor the *costs* incurred when natural resources are depleted or the environment is polluted.

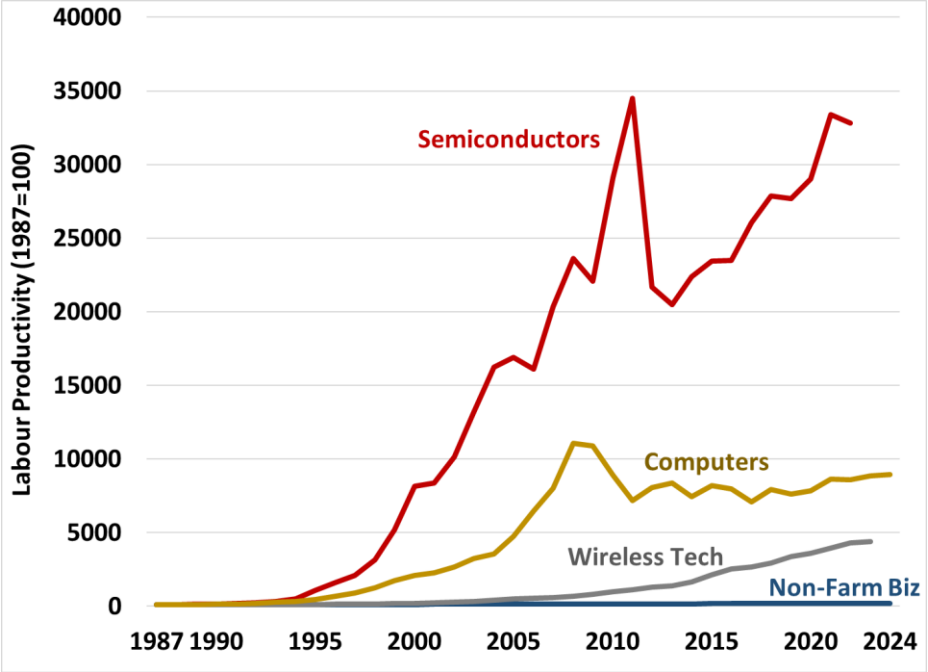
This can lead to very misleading conclusions when flawed measurements (of GDP) are applied to productivity (GDP per hour). For example, it might seem more productive to harvest trees through clear felling: cutting down every tree in a forest certainly allows a greater number of trees felled per hour of work, compared to harvesting timber in more selective but sustainable ways. But this ascribes no value to the continued viability of the forest – with implications for forest rejuvenation and broader environmental quality. In the extreme, the whole industry could collapse as a result of resource depletion, which is obviously not good for productivity. Similar problems afflict productivity measurements in other resource and extractive industries (such as mining and fishing).

Sectoral composition: Some activities and industries are inherently more amenable to productivity growth (through the application of machinery and technology) than others. For this reason, economy-wide productivity measures are sensitive to differences in the composition of total GDP across countries or over time. For example, manufacturing has traditionally been a source of relatively strong productivity growth, thanks to the capacity to apply labour-saving technology: from the early assembly lines of Henry Ford to modern-day automation and robotisation.

In recent years, some industries have experienced phenomenal increases in labour productivity as a result of technological breakthroughs: such as information and communications technology, semiconductors and electronic products. Measured in gigabytes of memory capacity produced per hour of labour, semiconductor manufacturing has become many thousands of times more productive over the past four decades. The same is true of other industries experiencing very rapid technological change. For example, Figure 1 illustrates labour productivity growth since 1990 in three high-tech U.S. industries: semiconductors, computer manufacturing, and wireless technology. By measuring output per hour in "real" terms (such as gigabytes of chip capacity or gigabytes of transmitted data), these measures imply astronomical productivity gains – even if the concrete conditions of work in those industries may not have changed very much at all. Apparently, workers in U.S. semiconductor manufacturing became 32000% more productive since 1990. Labour productivity in computer manufacturing rose almost 9000%, and in wireless communications over 4000%. Economy-wide non-farm business productivity in the U.S. almost doubled in that time (better than most industrial countries), but that growth doesn't even register on the y-axis of Figure 1. While employment in those super-performing industries makes up a small share of total U.S. employment, that

astounding apparent productivity growth was enough to pull up economy-wide averages considerably.

Figure 1. U.S. Labour Productivity Growth by Industry, 1987-2024



Source: Calculations from U.S. Bureau of Labor Statistics, Industry Productivity Viewer.

Conversely, many extractive industries (like mining) tend to experience *falling* productivity over time, as initial easy-to-access reserves are used up, and mines undertake more complex and expensive efforts to access less convenient reserves. For that reason, countries with larger resource industries (like Australia) typically experience downward pressure on average productivity over time. Economies with relatively larger public sectors may also seem to experience slower productivity growth, purely because of the measurement problems related to public sector productivity (discussed above). All of these cross-industry differences in productivity need to be considered carefully in both evaluating productivity performance in any individual country and then imagining policy options for improving it.

Capacity utilisation and business cycles: Productivity performance can be affected significantly by the ebbs and flows of the overall economy. When the economy is growing strongly, and businesses and factories are busy trying to meet consumer demand, productivity tends to improve. The initial overhead labour required to perform basic set-up and administrative tasks in a workplace can then be spread over a larger volume of production, reducing total work required per unit of output. There are limits to this positive cyclical effect, of course. If a workplace becomes too busy or

overwhelmed with new orders, then productivity can suffer (and that's when management will need to consider an expansion).

Conversely, if an industry encounters a slump, workers and physical capacity will not be fully utilised, and productivity will fall. Downsizing of staff may follow, but with a lag. Productivity then falls. The same pattern is visible at the level of the overall economy: productivity tends to improve during an expansion and decline during a recession. (Unusually, the reverse occurred during the COVID pandemic and lockdowns: for reasons explained below, productivity improved when the pandemic hit and then declined as the economy re-opened.)

The powerful impact of business cycles and capacity utilisation on productivity needs to be considered when comparing productivity trends over time or across countries. Periods of sustained sluggish growth will naturally be associated with poor productivity – which is another good reason why macroeconomic policy should target full employment and strong growth (rather than prioritisng deficit reduction, lower inflation, or other goals). This was true in Australia during the latter half of the 2010s, when both economic growth and productivity growth were unusually slow. A key prerequisite for maximising the productive potential of new technology and skills is making sure the economy is managed at or near full employment, to capture the benefits of full capacity utilisation on overall efficiency.

WHO'S IN CHARGE, ANYWAY?

As discussed above, the best way to measure productivity is by the amount of output produced relative to labour input (labour productivity). This focus on labour leads some observers to conclude that productivity is "all about the workers." Boosting output per hour is the name of the game – and it might seem obvious the best way to do that is to employ better, more motivated workers, and get them to work faster and harder.

This focus on workers as the source of productivity growth (implying they must be the "culprit" when productivity is poor) is mostly misplaced. To be sure, human labour is the essential input to all industries. And the physical and mental effort of workers is the driving force of production. We want to organise an economy in which workers are equipped, trained, and supported to do the best jobs they can – and compensated fairly for it.

But in an economy dominated by private profit-seeking businesses, workers have little impact on productivity. Certainly, it is not possible to improve productivity over the long term by pushing (or threatening) workers to work ever faster, harder, and longer.

The limits of physical and mental endurance mean that any such productivity gains are illusory and likely temporary.

The most important determinants of productivity are outside of the immediate control of workers. These include:

- the capital, technology and machinery used in production
- the fundamental organisation of work (including workplace layout, production systems, and supply chains and logistics)
- the inherent value-added of output (low-cost mass-produced commodities are inherently less valuable than more expensive, customised, high-quality products and services – and hence workers producing those things will seem less "productive")

In private businesses, workers have little control over these fundamental choices regarding the nature of production (and in fact, under Australia's restrictive labour laws, workers are usually prohibited from even trying to negotiate these issues with management). Rather, these matters are the exclusive domain of the owners and managers of private companies. It is they who decide what will be produced, how it will be produced, and what equipment and technology will be provided to those doing the producing. Workers can make suggestions on these things: helping improve how machinery is used on the plant floor, or the layout of production lines (and in unionised workplaces, workers can offer these suggestions safely, without fear of reprisal). The concrete hands-on knowledge and experience of workers should be respected and considered more consistently by management. But at the end of the day, responsibility for organising efficient production in a private sector economy lies with the owners of the businesses that make up most of that economy.

Business lobbyists are prone to blame workers for lacking the proper worth ethic or discipline, and to blame unions and labour laws for standing in the way of maximum productivity (thanks to inconvenient restrictions like lunch and rest breaks, limits on working hours, or mandated safety practices). Ultimately, however, it's not workers in charge of productivity. Australia's productivity performance is shaped by the willingness and capacity of businesses to invest, innovate, and organise production. But maximising profits, not productivity, is their ultimate goal – and that can lead them to do things that hold back productivity, rather than advancing it.

A good example is the rapid expansion of insecure platform-based businesses: they engage workers very inefficiently (workers often spend half their days idly waiting, unpaid, for new jobs to arrive over their smart phones) to perform menial tasks

(delivering food or passengers). The fact that this unpaid waiting time is free to the business, means there is no incentive for the platforms to try to use labour more efficiently. The result is an enormous drag on productivity: digital platforms (like Uber and Lyft) engage tens of thousands of Australians who spend hours each day doing nothing, and getting paid nothing for it. It is hard to imagine a more productivity-destroying business model.

To be sure, business decisions are shaped by broader economic policies and laws (in this case, by lax labour laws which have so far allowed platforms to evade normal minimum wages, hence encouraging wasteful business practices). So, government policies can obviously impact how productivity evolves. But it is owners, employers and managers, not workers or even governments, whose choices are the ultimate determinants of productivity. If business leaders are looking for a culprit for Australia's perceived productivity problems, they need to look in a mirror. Economics columnist Ross Gittins puts it aptly:

> Productivity is determined by how efficiently every workplace is organised. Since the great majority of workplaces are privately owned, if the economy's productivity isn't improving from year to year, it's primarily because the nation's bosses aren't bothering to improve it. Remember this next time you see the (Big) Business Council issuing yet another report urging the government to do something to improve productivity. What businesspeople say about productivity is usually thinly disguised rent-seeking.[19]

DOES PRODUCTIVITY MATTER?

Workers in Australia might be forgiven for responding to the latest wave of national hand-wringing over productivity with deep skepticism. First of all, complaints and sermonising about the supposed "crisis" in productivity have been heard many times before. Secondly, so many "productivity" initiatives handed down by business executives involve telling staff to work harder and longer, for less. As we have seen, cutting wages has no direct relevance for productivity (and will usually undermine it). Employers regularly misuse productivity as a justification for belt-tightening; they are motivated by hunger for profits, not true productivity. So, the lack of enthusiasm among rank-and-file Australians for another round of productivity proselytising is not surprising.

[19] Ross Gittins, "Want greater productivity? Set wages to rise by 3.5 percent every year," *Sydney Morning Herald*, 19 May 2025.

Orthodox economics simply assumes there is an automatic link between productivity and wages, and that higher productivity will translate into better living standards for workers. This assumption is critiqued in Part III of this report. If productivity did indeed perfectly translate into higher wages, workers would be more gung-ho about anything that can improve productivity. Indeed, many economists falsely equate living standards with labour productivity (measured by GDP per hour, or even worse by GDP per capita[20]). A country can have high GDP per hour or per capita, but terrible living standards – if the GDP produced is not useful, or not widely shared, and/or was produced through methods that hurt people rather than lifting them up.

Given the chronic misuse of productivity rhetoric to justify harsh workplace practices or austere economic and fiscal policies, and the lack of any reliable connection between productivity and wages or living standards, should workers even care about productivity? Does it matter?

The answer to this question is "Yes, but…" Higher productivity, if attained through constructive and genuine channels (such as technology, innovation, and skills), expands the capacity of society to produce more of the goods and services necessary for good living standards. Higher productivity means the economy can produce more output, for each of the workers who make the economy run. That creates the *potential* for a better life.

But higher productivity on its own does not guarantee that better life. Working people must be on guard against productivity strategies that impose unfair costs on workers, communities, or the environment – by degrading the quality and safety of jobs or running down natural resources. And then they must be empowered to demand that productivity gains are fairly distributed: through a combination of wages, better entitlements, quality public services, and shorter working hours. In a best-case scenario, tying productivity growth directly to fair distribution of its benefits creates a virtuous circle that reinforces worker engagement in productivity improvements (like facilitating introduction of new technology, or participating in training initiatives). Workers and their unions will be more likely to actively support productivity initiatives, if they are confident they will fairly share in their successes.

From this perspective, productivity is never a goal in and of itself. Society should pursue actions and policies that can generate genuine improvements in economic efficiency, while resisting proposals that either have no impact on productivity (like wage cuts) or boost productivity in superficial and unsustainable ways (like intensifying

[20] GDP per capita is especially misleading as a measure of living standards because it takes no account of working hours; a country that required workers to work 70 hours work per week would thus be considered twice as "productive" as one requiring 35 hours per week.

work). Those initiatives must be directly tied to institutions and policies that then ensure resulting efficiency gains are fairly shared. This requires institutions like stronger Awards and collective bargaining (including multi-employer or sector-wide collective bargaining, which can directly link real wage gains to productivity growth), fair taxation (so that a share of efficiency gains are used to fund public services), and reductions in working hours (so that workers have more time, as well as higher real incomes, to enjoy the fruits of their labours).

Part II: Understanding Australia's productivity challenges

AUSTRALIA'S PRODUCTIVITY PERFORMANCE

As an advanced industrial country, with generally modern technology, high-quality infrastructure, and well-educated workers, Australia demonstrates high levels of labour productivity. In 2024, Australian workers produced an average of $115 of value-added (or GDP) with each hour of their labour.[21] Keep in mind that on average workers were paid less than half of that in total compensation (including superannuation contributions). The rest of it went to corporate profits, small business income, and government indirect taxes (like the GST).

Adjusting for price levels and international exchange rates, Australia ranks 16th among the 38 countries in the OECD according to the level of labour productivity. That's not in the top tier of countries: the top five in 2023 were Ireland, Luxembourg, Norway, Belgium, and the U.S.[22] But by global standards, Australia has a highly productive economy. That productivity provides a foundation for a high standard of living – although, as discussed above, there is no guarantee that productivity translates into good living standards.

Over time, the growth of productivity determines how quickly overall efficiency is improving. In the booming initial postwar period (from the 1950s through the 1970s), productivity grew at more than 2% per year (see Figure 2). This reflected the industrialisation of Australia's postwar economy, the introduction of new technologies (including manufacturing, transportation, and eventually computer and telecommunications technologies), and improvements in skills and training.

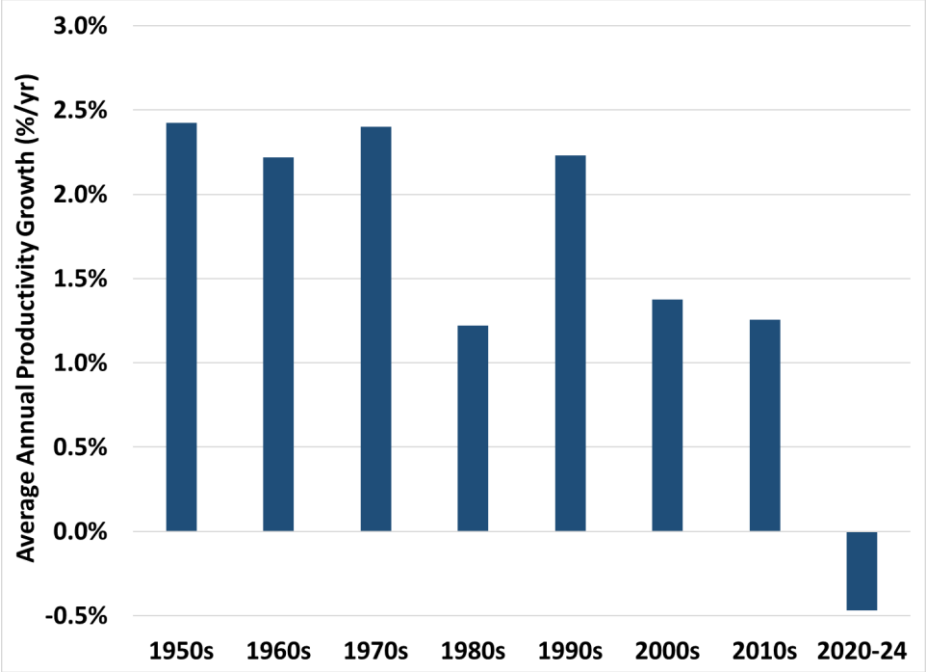
If matched by corresponding wage increases (and expanded public services), productivity growth of 2% per year *could* underpin a doubling of living standards every 35 years. And that is exactly what happened in Australia between 1945 and 1980: average real incomes more than doubled, complemented by the expansion of public services and non-wage benefits (like superannuation). That was neither an accident, nor an automatic result of market forces. Rather, the doubling of living standards

[21] Calculations from ABS, Australian National Accounts: National Income, Expenditure and Product, Table 1, and Labour Account Australia, Table 1.

[22] Calculations from OECD Data Explorer, Productivity Levels.

during the post-war expansion was achieved thanks to a deliberate strategy of inclusive, equitable growth. Strong unions, strong labour laws (including strong Awards), militant workers, fair taxes, growing public programs: all helped ensure that productivity growth translated into better lives.

Figure 2. Average Annual Productivity Growth by Decade, 1950 - 2024



Source: Calculations from ABS Australian National Accounts: National Income, Expenditure and Product, Table 1, and RBA "Australian Economic Statistics 1949-1950 to 1996-1997," Occasional Paper #8, June 1996.

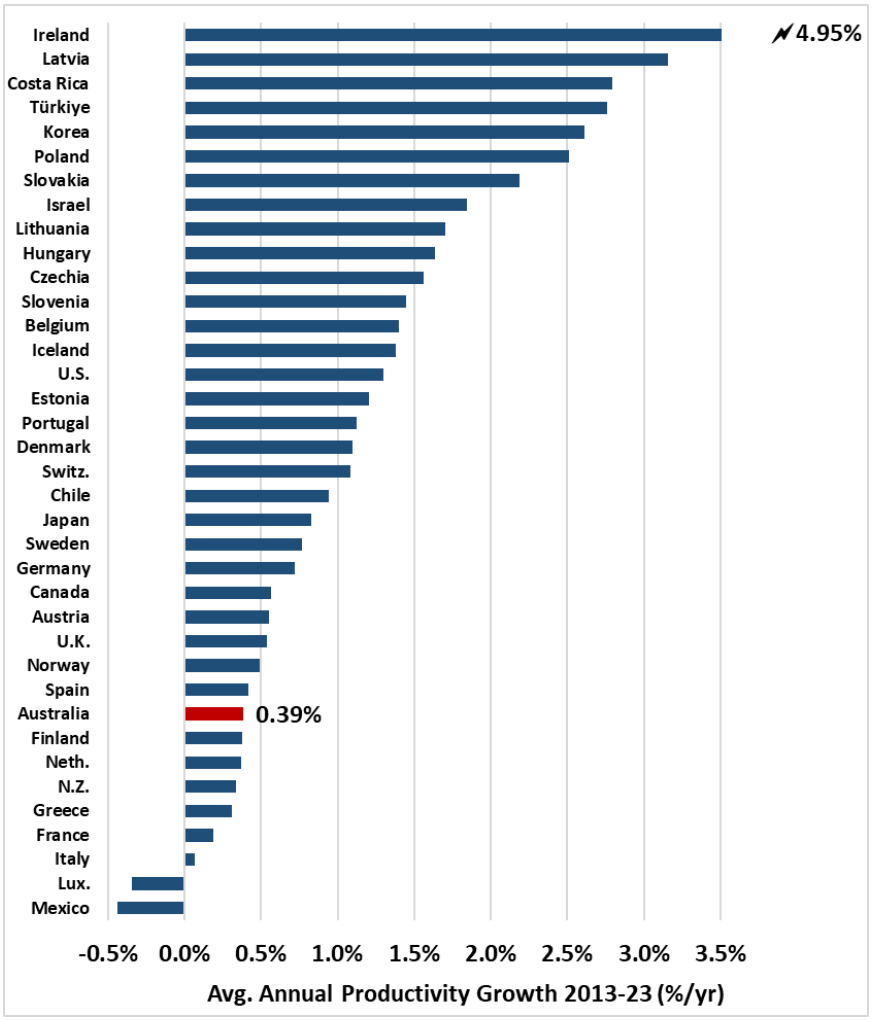
Productivity growth then slowed by about half in the 1980s. That was mostly because of the side-effects of the painful worldwide recession and slow recovery experienced early in that decade; as discussed above, productivity generally suffers during periods of very slow growth or recession. Productivity growth then rebounded to earlier postwar rates in the 1990s. After 2000, however, productivity growth slowed more permanently – averaging just 1.25% from 2000 through 2020.

Since the COVID pandemic hit in 2020, productivity growth has stopped cold in Australia. In fact, average productivity has *declined* somewhat since the pandemic (for unusual reasons considered below). Even before the pandemic, however, it was clear the productivity momentum that Australia enjoyed in its earlier postwar history had dissipated.

The long-run slowdown in productivity growth is not unique to Australia; the major reasons for it will be considered further below. Nevertheless, in international perspective Australia's slowdown has been relatively severe. Australia's average

productivity growth in the last ten years (from 2013 to 2023, a period that includes pre-pandemic and pandemic years) was 0.39%, ranking 29th out 37 OECD countries reporting data (see Figure 3). Countries which achieved the fastest productivity growth in this period include several industrialising countries in Eastern Europe; other developing countries (including Türkiye and Costa Rica); and Ireland, Korea, and Israel.

Figure 3. Average Annual Labour Productivity Growth, OECD Countries, 2013 - 2023



Source: Calculations from OECD Data Explorer, Productivity Growth Rates.

Ireland boasts both the highest level of productivity, and the fastest rate of productivity growth over the past decade (almost 5% per year), according to OECD data. Its reported *level* of labour productivity per hour is more than twice as high as Australia's. This is a surprising and very misleading result. While Ireland is a beautiful and fascinating country, it is not rich, and its economy does not generally embody the cutting edge of modern technology and efficiency. Ireland's standing in productivity is largely a mirage, and a good case study in the pitfalls of uncritically relying on productivity as a benchmark of economic and social progress. Ireland is a member of

the European Union but has an unusually low corporate tax rate (12.5%, well below other EU countries). To take advantage of this favourable tax rate, huge global companies (including U.S. tech giants like Microsoft and Apple) have established Irish subsidiaries, to which they transfer internal funds (nominally for items such as intellectual property or management fees). This effectively shifts to Ireland much of the profit these firms generate on their global operations, where they attract a lower corporate tax rate than in jurisdictions where the profits were genuinely generated. In turn, this boosts Irish GDP, which includes the profits of foreign-owned subsidiaries.[23] In 2023, more than half of all net value added in Ireland consisted of business profits, and two-thirds of that belonged to foreign firms. The huge profits of these companies, and their use of this potent tax avoidance strategy, generates little benefit for the Irish people. To the contrary, Ireland's low corporate tax rate (like other tax havens) undermines the capacity of all countries to collect fair taxes from the world's wealthiest corporations and investors – to fund the public services and infrastructure that are vital to the successful operations of those same businesses. Far from demonstrating the potential of productivity growth, or providing a model for how to achieve it, the Irish case reinforces rightful skepticism of uncritical use of productivity as magic bullet for all economic and social problems.

Luxembourg ranks second in the OECD for the level of productivity, and for similar reasons: it is also a low-tax haven within Europe, attracting head offices and artificially relocating the accounting profits of multinational corporations. This boosts Luxembourg's GDP, which in turn boosts apparent productivity – but at the cost of reduced fiscal capacity in Europe (and around the world).

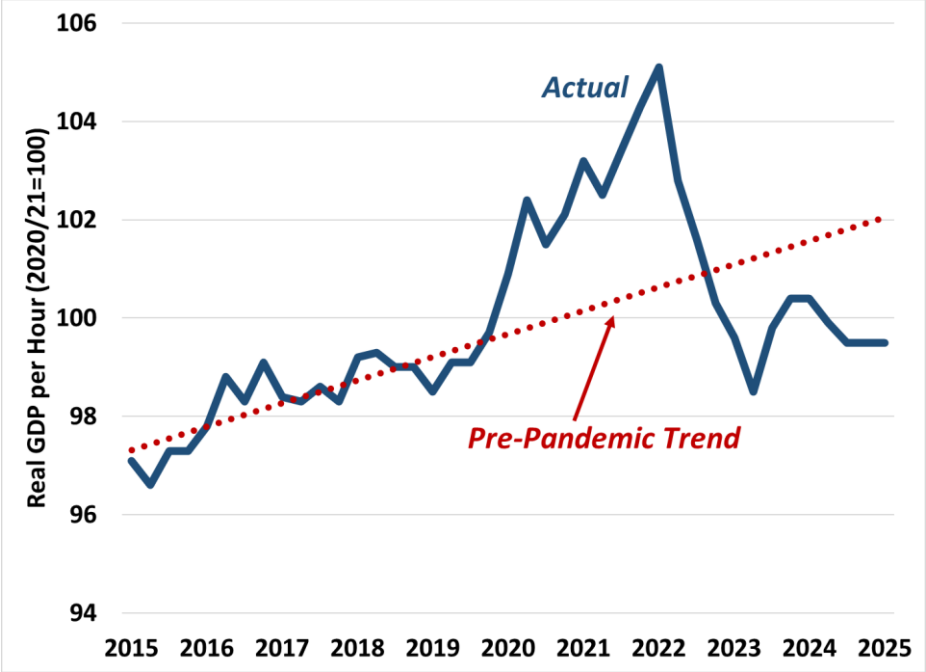
PRODUCTIVITY AFTER THE PANDEMIC

The social and economic disruptions of the COVID pandemic affected all measures of economic activity, and productivity is no exception. The pandemic led to numerous unprecedented shocks to Australia's economy: the emergency shutdown of entire sectors (such as retail, hospitality, and many personal services); payment of unprecedented income supports and subsidies (including wage subsidies which allowed firms to retain and pay staff even if they were not working); disruptions in global supply chains due to closed borders and shortages of key inputs (such as

[23] For more on this practice, see Civil and Public Services Union, "Tax Justice! Ireland's Role in the International Context," (Dublin: Civil and Public Service Union, 2015), https://waronwant.org/sites/default/files/Tax%20Justice%20Irelands%20Role%20in%20International%20Context.pdf; and Lyslie Boller, et al., "The End of the Double Irish: Implications for US Multinationals and Global Tax Competition," *Budget Model Brief*, Penn Wharton, October 14, 2024, https://budgetmodel.wharton.upenn.edu/issues/2024/10/14/the-end-of-the-double-irish.

semiconductors, motor vehicles, and building materials); and sudden shifts in consumer demand. Later, the economy experienced rapid but temporary inflation (peaking in late 2022) due to shortages, higher energy costs, and record corporate profits.[24]

Figure 4. Labour Productivity Since COVID: Actual and Trend, 2015-2024



Source: Calculations from ABS Australian National Accounts: National Income, Expenditure and Product, Table 1.

These unprecedented disruptions had dramatic impacts on recorded productivity levels. Initially, productivity seemed to surge during the initial health lockdowns (see Figure 4). This was a statistical oddity, resulting from the fact lockdowns had the biggest impact on face-to-face service industries (such as hospitality, retail, and travel), which tend to have lower-than-average productivity levels. The resulting shift in the composition of employment toward higher-productivity jobs (more of which could keep working) produced an increase in apparent productivity.[25] This effect was reversed after lockdowns ended, and face-to-face service industries could resume activity; most of the lower-productivity jobs in those sectors were restored, and

[24] For a comprehensive account of the emergence of inflation in Australia after the pandemic, its causes, and consequences, see Jim Stanford et al., *Profit-Price Inflation: Theory, International Evidence, and Policy Implications* (Canberra: Centre for Future Work, 2023).

[25] This experience contains a lesson in the dangers of focusing unduly on productivity as a goal in and of itself: a powerful way to boost average productivity in the economy is to completely shut down industries with below-average productivity! Of course, this would be economically and socially devastating, as we learned during the pandemic.

average productivity came back down. By 2023, average labour productivity was no higher than it had been in 2019. Since then, however, it has continued to lag well behind the trend that prevailed before the pandemic.

It is important to note that most other industrial countries have also experienced disruptions in productivity since the pandemic, so these issues are not unique to Australia. Economists have yet to develop a conclusive explanation for these trends. Some of it may result from measurement issues in evaluating nominal output, average prices, and working hours – all of which were deeply shocked during and after the pandemic.

Even after the post-lockdown restoration of employment in lower-productivity service industries, shifts in the composition of employment continue to affect overall productivity averages. The rapid growth of employment in public sector and care work, for which conventional productivity measures are mostly invalid (as discussed above), may have played a role.[26] These services must grow to meet social priorities. The fact that existing statistical techniques do not allow accurate measurement of productivity trends in these industries (which is hence assumed to be non-existent), causing an apparent but misleading "slowdown" in overall productivity metrics, is hardly a reason not to expand them. Australia's construction industry (especially the decentralised residential sector) has also demonstrated relatively slow productivity performance in recent years. Construction activity has also expanded since the pandemic in the face of Australia's housing shortage, so this is another channel through which compositional changes are undermining overall average productivity growth.[27]

Labour productivity has fallen the most since the pandemic in industries that most increased total hours of labour after the lockdowns.[28] Once again, this might reflect measurement errors resulting from major disruptions in both output and employment during and after the lockdowns; since hours of work enter directly as the denominator in the formula for productivity, industries with faster growing hours of work could seem to have lower productivity for purely arithmetic reasons, unless growth in the

[26] Supporting this hypothesis is the fact that productivity growth in the market (or for-profit) sector of the economy was about twice as fast from end-2019 to early 2025 as overall productivity growth (which was artificially suppressed by the growth of public sector employment). For more detail on this issue see Craig Emerson, "Furphies, Fetishes, and Fixes in the Productivity Debate," *The New Daily*, 12 June 2025.

[27] For more details on productivity in residential construction, see Productivity Commission, "Housing construction productivity: Can we fix it?" (Canberra: Productivity Commission, 2025). The productivity weakness in construction is concentrated in the very decentralised residential construction sector.

[28] For details, see Jeff Borland, "Our latest productivity puzzle," Labour Market Snapshot #106, November 2024, https://drive.google.com/file/d/1yWzfRHBMl3jCEJyxtHG_nBX3foeYpbVC/view?usp=sharing.

real value of output (in the numerator) is accurately captured. It is also possible, however, that faster-hiring industries experienced genuine productivity challenges, resulting from time lags in integrating and training new employees, or expanding capital equipment to match the rising number of workers. Indeed, capital investment by Australian businesses in new machinery and technology was extremely weak during and after the pandemic, and this has definitely contributed to current weak productivity performance (the link between capital and productivity is discussed further below).

Another factor in the unusual performance of productivity during and after the pandemic has been major swings in population and labour force growth during this time, associated with dramatic shifts in immigration flows. During the first months of the lockdowns, immigration was largely stopped. Later on, as employers made exaggerated complaints about "labour shortage", immigration was expanded rapidly. The result was a rapid but temporary surge in Australian population growth, which peaked at over 2.5% annually in mid-2023 (the fastest in decades). The working age population grew even faster, by over 3% at peak during 2023. Rapid population and labour force growth can affect productivity through various potential channels: new immigrants are often channeled into lower-productivity, lower-wage jobs; some must traverse certification or licensing processes before becoming fully engaged; and they may face other delays in conducting work at their full potential. More recently, immigration policies have been readjusted, and population growth is returning to more traditional rates. Therefore, the impacts of the temporary spurt of post-pandemic population growth on productivity are likely to dissipate.

Another potential factor in the current productivity slowdown is the sluggish macroeconomic environment that prevailed after the Reserve Bank imposed painful interest rate increases to combat post-pandemic inflation. GDP growth in Australia slowed to near zero (and to below zero in per capita terms), as both consumer spending and business investment slowed dramatically because of interest rates. As noted above, productivity exhibits cyclical trends, rising when the economy is strong and workplaces are fully utilised, falling when the reverse is true (as was the case in 2023 and 2024). With inflation now back within the RBA's target range, and interest rates finally beginning to fall, macroeconomic conditions should improve – and this should have the normal expected benefits for productivity.

There is no doubt that Australia's economy continues to grapple with the aftershocks of the COVID pandemic. Wild swings in labour productivity – which, recall, is a composite product of several other variables, each of which experienced its own wild swings in this time – are one of the most dramatic signs of that instability. The unusual pattern of productivity since the pandemic is not unique to Australia and should be

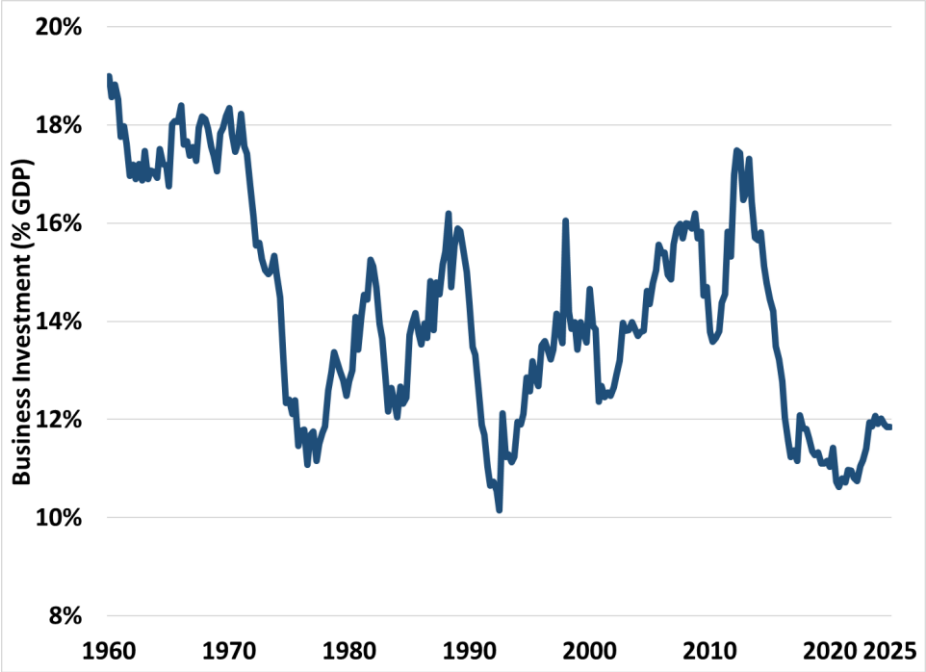
interpreted cautiously. It is likely that as economic conditions continue to normalise (with lower inflation, falling interest rates, restored economic growth, and slower immigration and population growth), productivity performance will stabilise. However, even before the onset of the pandemic, Australia's productivity performance suffered from longer-term challenges. Those challenges, not the temporary disruptions experienced in the pandemic, should be the primary focus of economic and policy research.

FACTORS IN AUSTRALIA'S LONGER-RUN PRODUCTIVITY PROBLEMS

Even before the onset of the COVID pandemic, Australia's labour productivity performance was unimpressive, compared both to other industrial countries and to previous periods in Australia's economic history. Economists and advocates have advanced numerous theories about the reasons for slower productivity growth in recent years. The federal government's productivity initiatives (including the productivity summit in August) will explore some of these possible causes, and potential policy remedies. This section will review evidence for some of the most likely factors behind Australia's longer-term productivity slowdown.

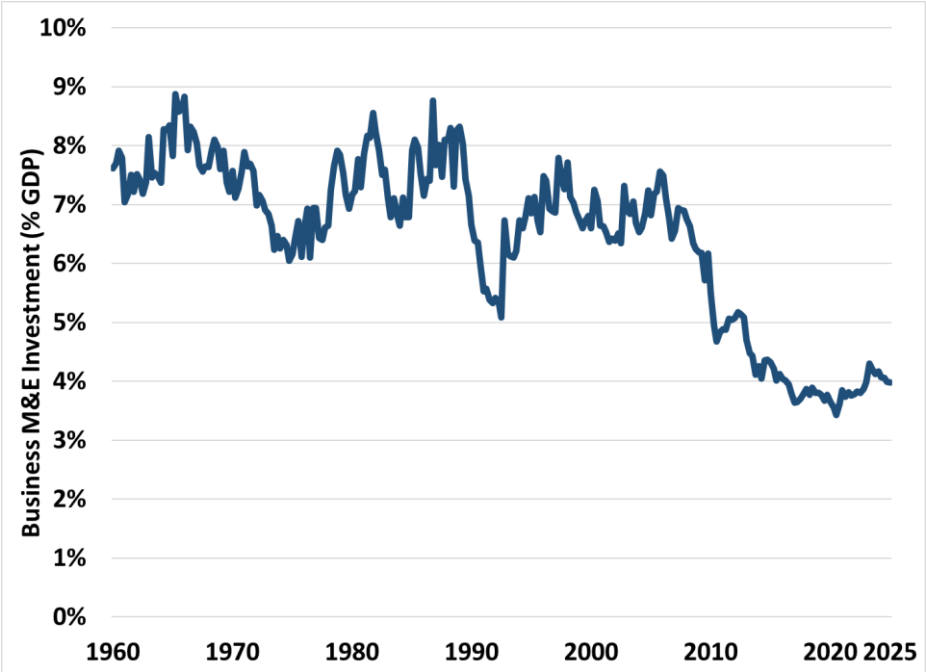
Weak capital investment*:* Australia's strong economic growth, job-creation, and productivity improvements during the initial postwar decades were led by strong capital investment by the business sector. Businesses invested as much as 18% of national GDP in new capital during the postwar boom. However, after the mid-2010s (years before the COVID pandemic), that rate of investment slackened by one-third (see Figure 5). Since then, Australia's businesses have recorded the lowest sustained rate of capital investment of the entire postwar era: just 11% of GDP on average since 2017. Without strong investment in new capital, businesses cannot take advantage of new technology and production practices. Strong investment in earlier decades was crucial for powering both quantitative expansion and qualitative expansion during the postwar boom, as Australia transformed into an important manufacturing and technology player. Since then, weak investment has been associated with both sluggish growth (in GDP and productivity) and qualitative regression (with Australia becoming focused more on resource extraction rather than technology-intensive value-adding industries).

Figure 5. Business Capital Investment as Share GDP, 1960-2025



Source: Calculations from Australian Bureau of Statistics, Australian National Accounts: National Income, Expenditure and Product, Table 3.

Figure 6. Australian Business Investment in Machinery and Equipment, 1960-2025



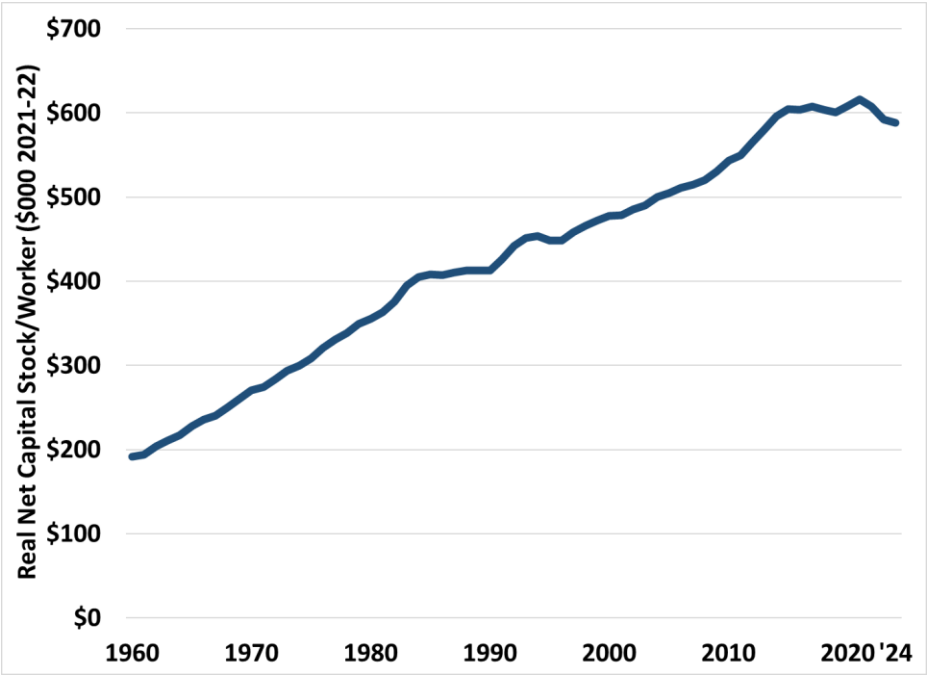
Source: Calculations from Australian Bureau of Statistics, Australian National Accounts: National Income, Expenditure and Product, Table 3.

The situation is even more dire regarding investments in tangible machinery and equipment (including all varieties of tools, factory equipment, computers, and robots). This component of tangible investment is especially important for productivity and innovation. For the last decade, business machinery and equipment spending has languished at just half the rate typical during the postwar expansion: just 4% of GDP, compared to 8% or more from the 1960s through the 1980s (see Figure 6).

This failure of business investment in general, and machinery and equipment investment in particular, cannot be attributed to a lack of profits, incentive, or cash flow: corporate profits as a share of GDP rose sharply after the 1980s (thanks to sustained business-friendly policy changes). But the share of corporate profits reinvested in Australia has declined steadily. Weak business capital investment is likely the most important single cause of Australia's productivity slowdown – and responsibility for it lies squarely with the business community (not with taxes, "red tape," or unions).

Falling capital-labour ratio: The combination of sluggish business capital spending and unusually rapid population growth after the COVID pandemic has produced an unprecedented and concerning outcome. The aggregate ratio of net capital to labour employed in Australia's economy has been falling since 2021 and is now lower than it was a decade ago (Figure 7).

Figure 7. Aggregate Capital-Labour Ratio, Australia, 1960-2024

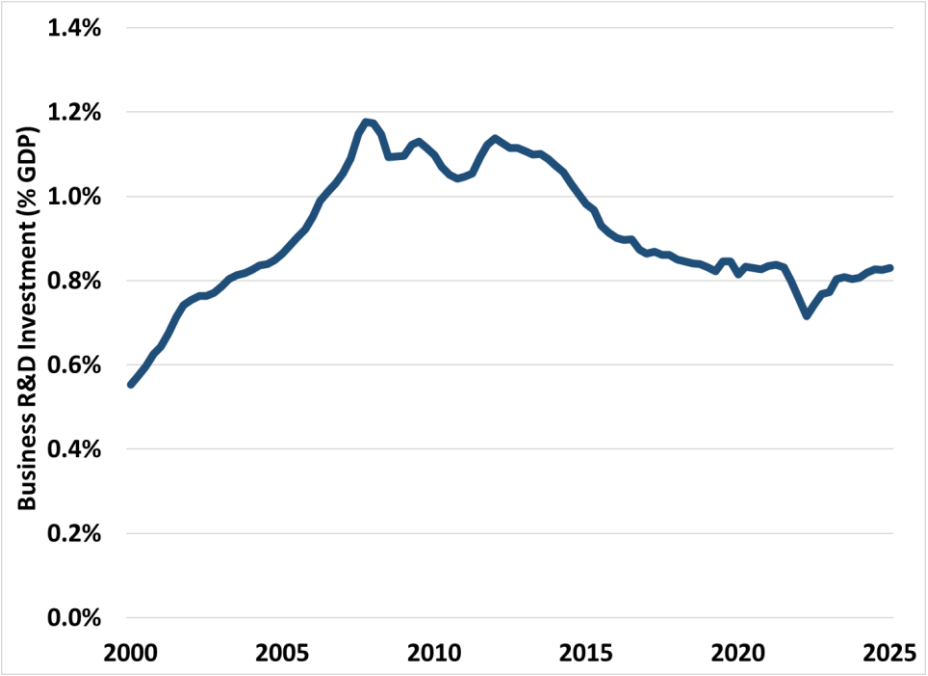


Source: Calculations from Australian Bureau of Statistics, Australian System of National Accounts (Annual), Table 63, and Labour Account Australia, Table 1.

On average, after adjusting for inflation and depreciation of existing capital, the typical worker in Australia in 2024 was working with 5% less net business capital assets and equipment than in 2021 – a decline in net capital stock of about $30,000 per worker. The historical process of economic development is closely associated with the accumulation of more capital and equipment over time. But on this score, for the first time in postwar history, Australia is going backwards, not forewards. The declining capital intensity of production also reflects the growth of relatively labour-intensive (and relatively less productive and lower-wage) industries, such as private and personal services.

Weak business innovation: Slow accumulation of physical capital has been a core cause of Australia's poor productivity growth. But there is another way in which Australian businesses have reneged on their responsibility to advance the country's economic potential. Business investment in intangible knowledge and technology has also declined in the last 20 years, which is perverse considering the accelerating technological revolution which is transforming work and production in other industrial countries. As illustrated in Figure 8, business investments in research and development in Australia have declined by about one-third as a share of GDP since the mid-2000s.

Figure 8. Australian Business Investment in Research and Development, 2000-2025

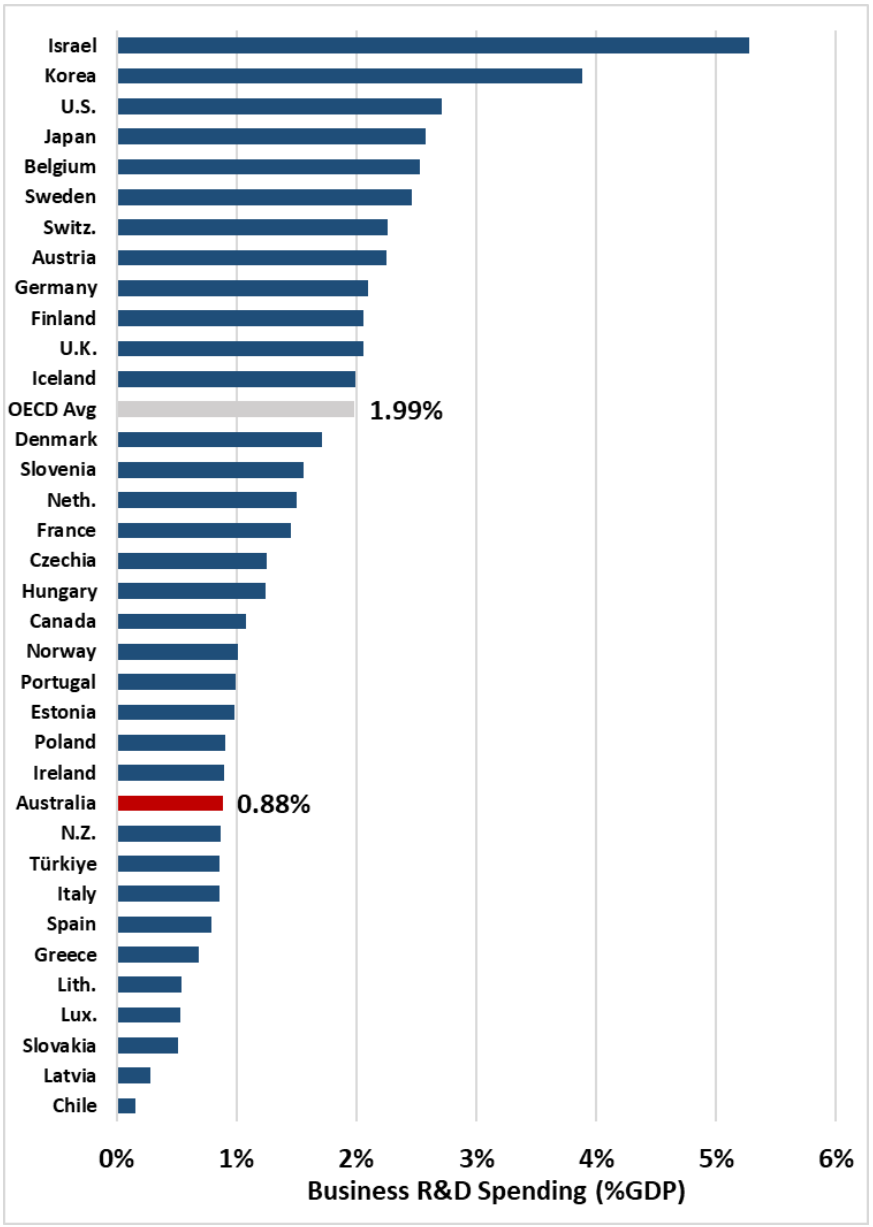


Source: Calculations from Australian Bureau of Statistics, Australian National Accounts: National Income, Expenditure and Product, Table 3.

Australia's business innovation effort also increasingly lags behind other countries. Figure 9 illustrates comparative levels of business R&D spending as a proportion of

GDP for OECD economies. The business sectors in global R&D leaders like Israel and Korea invest 4-5% of GDP in new research activities (often through direct partnerships with government through active innovation programs and industrial development strategies). Businesses in the U.S., Japan, and northern Europe are also strong innovation performers. On average across the OECD, businesses invest about 2% of GDP in research and development. Australian, business, unfortunately, invests less than half that much – ranking a lowly 25th out of the 35 OECD countries reporting this data.

Figure 9. Business R&D Investment as Share GDP, 2021



Source: OECD Data Explorer, Main Science and Technology Indicators.

Given Australia's relatively well-educated population, and the strong research capacities of our public institutions (including universities, CSIRO, and other publicly-funded research bodies), the failure of Australian businesses to invest in research and innovation is puzzling and concerning.

Of course, business lobby groups will demand concessions, tax cuts, and subsidies in order to step up their investment effort, shrugging off blame for poor investment performance onto other actors. However, chronic business underinvestment, despite unprecedented profitability in recent years, should not require more public handouts to resolve. The final section of this report will consider possible fiscal reforms that would target incentives more forcefully on incremental capital spending (rather than across-the-board tax cuts that increase profitability for investments that have already been made). But fiscal supports for investment must be accompanied by measures which challenge businesses to reinvest their abundant cash flow in Australian technology and industry. In other words, investment policy needs "sticks" as well as "carrots." And ultimately, responsibility for the failure of private-sector investment and innovation in Australia lies with the business community itself.

Sectoral composition: A key factor determining overall productivity levels and growth rates is the sectoral make-up of an economy. Countries which possess a larger footprint of dynamic, high-technology, value-adding industries are more likely to attain high and growing levels of productivity. A potent example of this is the U.S. economy, which is often held up as a role model in innovation and productivity. (For reasons explained below, this productivity performance has not translated into well-being for American workers, so the overall American package should certainly not be mimicked in Australia.) One reason for America's relatively rapid productivity growth is the disproportionate presence of technology-related industries where productivity growth (at least by conventional metrics) has been phenomenal (as illustrated above in Figure 1).

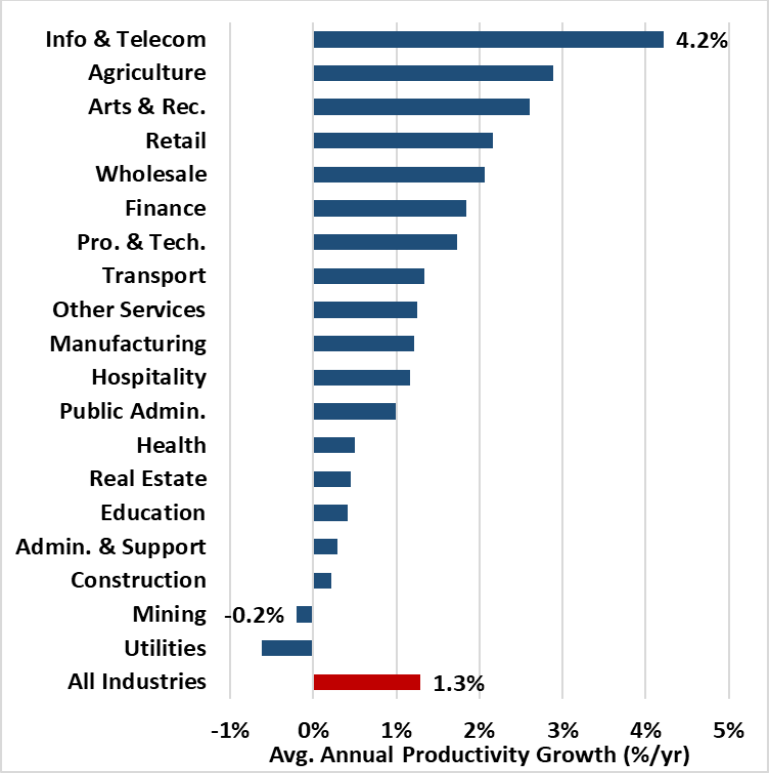
Every country in the world dreams of developing its own Silicon Valley, but of course that unique cluster is not replicable. Those that have made some progress in developing their own clusters of high-tech production (such as Japan, Korea, and Taiwan) have also recorded faster-than-average productivity growth, for similar reasons as the U.S.

There are two lessons in this analysis for Australia. First, it is yet another reason to exercise great caution in interpreting productivity statistics. We should understand that the superior productivity performance of some countries (like the U.S.) in part reflects a unique combination of history and geography that has led to success in very specialised high-tech industries – and that combination cannot be broadly replicated.

Second, while Australia cannot replicate Silicon Valley, it can certainly aspire to strengthen the presence of dynamic, technology-intensive industries here. This should motivate a greater focus on active industrial or sectoral development strategies to broaden our industrial and technological capacities.

The atrophy of Australian manufacturing in recent decades, and the renewed dependence on the extraction and export of unprocessed natural resources, has also contributed to Australia's productivity slowdown. While some resource industries have high *levels* of productivity (reflecting the very capital-intensive nature of their production processes), productivity tends to *decline* over time in extractive industries. This is because it usually takes more effort to extract and transport minerals and other resources, as the industry reaches for more remote or hard-to-access reserves. As shown in Figure 10, labour productivity growth in the Australian mining sector has been negative on average since the turn of the century. Yet resource extraction has grown as a share of total GDP and exports over this period. Meanwhile, technology-intensive segments of manufacturing (like the automotive sector) have declined or disappeared – in large part due to previous government neglect. Productivity growth has been strongest since 2000 in Australia's information and telecommunication sector.

Figure 10. Productivity Growth by Sector, 2000-2024

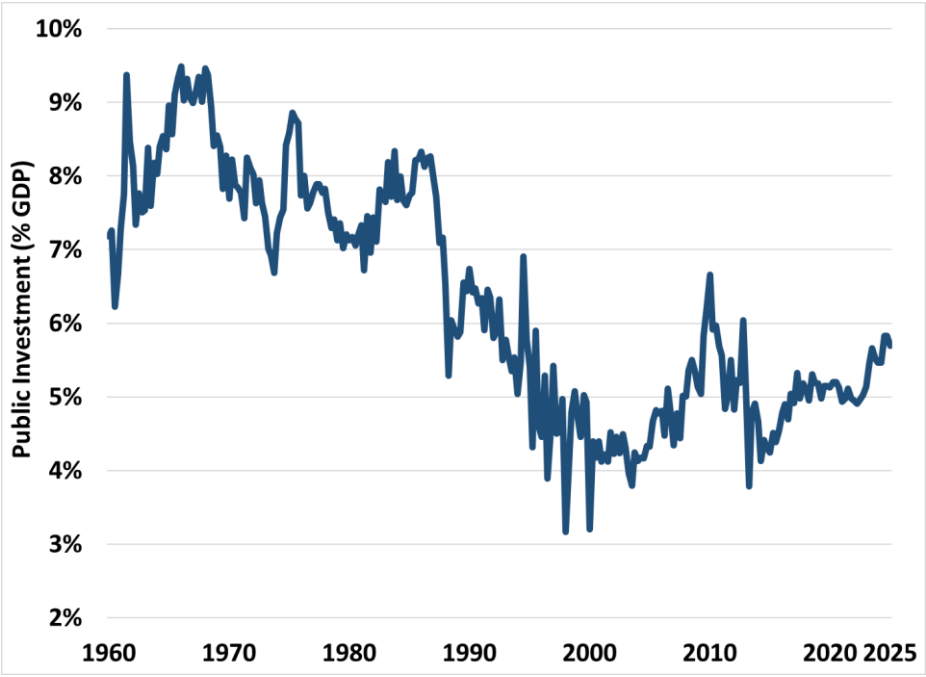


Source: Calculations from Australian Bureau of Statistics, Australian System of National Accounts (Annual), Table 15.

Using active industrial policies to nurture a larger high-tech presence in Australia (in advanced manufacturing, information and telecommunication services, and professional and technical services) will help to lift overall productivity growth. More important, it will provide Australia with a better and more diverse foundation from which to participate successfully in global trade – rather than continuing to rely so disproportionately on extraction and export of raw resources.

Infrastructure and public investment: The weak performance of private capital spending (especially in machinery and equipment, and innovation and research) has been the biggest single cause of slow productivity growth. But weakness in public investment has played a supporting role. During the initial decades of the postwar expansion, public capital spending (on infrastructure, public facilities, and investments by Crown corporations) was a significant driver of both economic growth and higher productivity. Public investment averaged about 8% of GDP until the late 1980s, when it was suppressed under more austere fiscal policies by state and federal governments (see Figure 11). In those earlier decades, building up Australia's transportation, communication, and utilities infrastructure reinforced productive activity by private firms, and supported Australians to live better and work more efficiently. Investments in expanded education and health care services (backed by capital spending into new facilities) further equipped Australian workers with the skills and capacities needed to reinforce productivity growth.

Figure 11. Australian Public Investment, 1960-2025

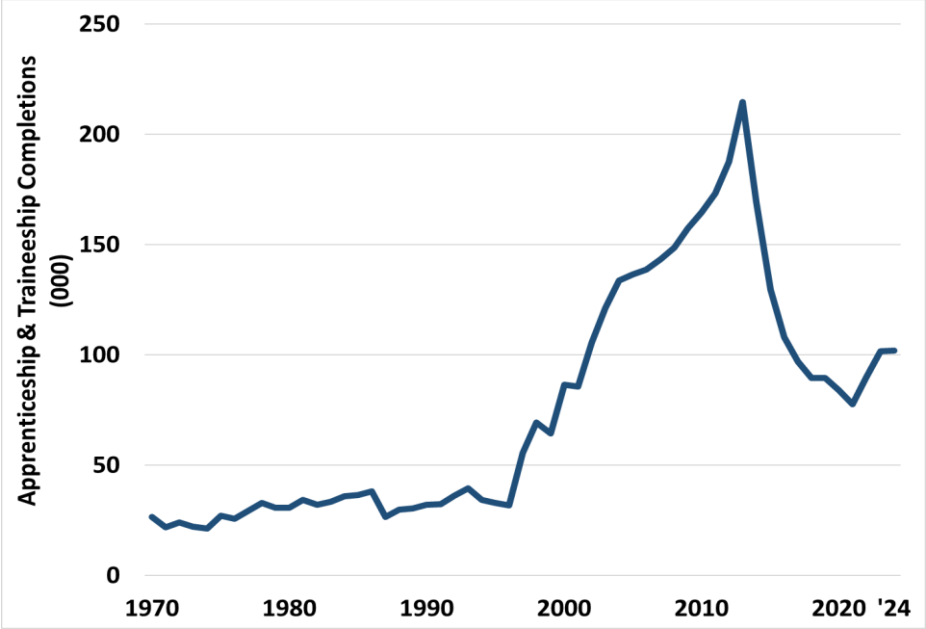


Source: Calculations from Australian Bureau of Statistics, Australian National Accounts: National Income, Expenditure and Product, Table 3.

After 1990, public capital investment fell significantly and has since averaged around 5% of GDP (except for a brief spurt during the Global Financial Crisis, when stimulus spending by government on new construction in schools and other public assets helped Australia avoid a recession). Decades of public underinvestment have undermined performance of transportation, utilities, and communication. Perhaps most painful is Australia's poor internet infrastructure, one of the worst in the industrial world. Inadequate infrastructure has negative implications for productivity across both the public and the private sectors. More recently, in the last five years public capital spending has grown modestly (and is now close to 6% of GDP). However, public investment needs to be expanded and sustained to ensure that Australia's public capital stock meets the needs of a dynamic, innovative economy.

Training and skills: Australia has a relatively well-educated population, and hence the skills of Australian workers should be a key advantage in supporting productivity and innovation. However, in some important ways, Australia's skills system has failed to meet the needs of an economy facing technological and demographic change. In particular, Australia's vocational training system was deeply damaged by years of privatisation, misguided handouts to questionable private operators, and fiscal cutbacks in the public TAFE system.[29]

Figure 12. Apprenticeship and Traineeship Completions, 1970-2024



Source: NCVER, Historical time series of apprenticeships and traineeships in Australia from 1963 to 2024.

[29] These failures are documented in Alison Pennington, *Fragmentation & Photo-Ops: The Failures of Australian Skills Policy Through COVID* (Canberra: Centre for Future Work, 2022).

Completions through Australian apprenticeship and traineeship programs fell by more than half under the Coalition Commonwealth government from 2013 to 2022 (see Figure 12). Relative to the size of the workforce, that decline in vocational training was even more severe.

Employers regularly complain about shortages of qualified staff in a wide range of occupations (despite the coexistence of unemployment and underemployment). The latest data from Jobs and Skills Australia indicate that one-third of 916 occupations tracked by the department report national-level shortages of skilled workers.[30]

The painful legacy of privatisation and underfunding in vocational education is now being addressed through renewed funding, fee-free TAFE programs, and new programs in key areas (such as new training streams in renewable energy technology). All this is supporting a partial recovery in training outcomes. However, it is clear the lingering damage from past failed skills policies still requires attention, before the system can fully meet the needs of Australia's future economy.

Labour market underutilisation and labour cheapening: A key prod for businesses to use labour more productively in their operations, is when labour becomes scarce and/or more expensive. In this regard, conditions of labour market tightness (with full employment and rising wages) reinforce the motivation for productivity improvements. Since labour in those circumstances is harder to recruit and retain, and likely becomes more expensive, employers face a strong incentive to conserve on labour – including through measures (like automated technology) that reduce labour demand. In contrast, employers' desire to undertake productivity-enhancing measures will be diluted an undermined if labour is inexpensive and readily available.

In this context, the abandonment of full employment macroeconomic policies since the 1990s (replaced by a focus on inflation control and deficit reduction) has contributed to the productivity slowdown. First, as noted above, productivity exhibits a pro-cyclical pattern: it increases when the economy is growing strongly, and capacity utilisation is high (by reducing the per-unit labour required for overhead and set-up costs). Second, when the labour market is weak for extended periods of time, the availability of surplus labour supply and corresponding weakness in wage growth makes it easier and less expensive for employers to utilise labour – even in functions which are not especially productive.

A virtuous cycle between full employment and productivity growth prevailed during the initial postwar expansion, when unemployment was deliberately kept very low.

[30] Jobs and Skills Australia, *2024 Occupation Shortage List: Key Findings and Insights Report* (Canberra: Australian Government, October 2024).

Full employment was the top priority of macroeconomic policy, and a closely regulated labour market (including widespread unionisation and Awards coverage) allowed the coexistence of low inflation and low unemployment. Unemployment averaged just 1.9% from 1949 through 1974.[31] Not coincidentally, that was also the era of Australia's strongest productivity growth. The scarcity of labour during this time reinforced the adoption of new technology by employers. And strong institutions of redistribution (including a strong Awards and collective bargaining system) ensured the resulting gains in productivity were broadly shared (as discussed further below).

With the sea change in macroeconomic policy over the past generation, however, unemployment was boosted – and, in fact, it is now deliberately maintained through a monetary policy framework oriented around the supposed existence of a "non-accelerating inflation rate of unemployment" (NAIRU). Other than very short periods (such as the first year after the end of COVID lockdowns), Australia's labour market has been chronically underutilised throughout the last generation. Higher official unemployment is one manifestation of that weakness; even what is now considered a "strong" labour market by modern standards features unemployment of 4% or higher. More important, other large pools of underutilised labour (such as underemployment) are now normal features of the labour market. The underutilisation rate (equal to the sum of unemployment and underemployment, as a share of the total labour force) has remained in double digits through virtually all of the last generation. As a result, it is usually easy for employers to mobilise underutilised labour to meet incremental needs, rather than trying to extract more productivity out of their existing workforce.

The role of labour scarcity in motivating productivity improvements has been further dissipated by the misuse of temporary migrant labour programs in Australia, which allow employers to recruit non-permanent migrants to fill labour requirements (often at lower cost than hiring Australian residents). Sound immigration policies can contribute to stronger productivity growth, by attracting specialised workers (such as in technology-intensive occupations) and supporting their full integration into Australian life and work (protected by full labour rights and security). Migrant labour programs, however, can have the opposite effect. Migrant workers are mostly hired into low-wage, vulnerable jobs, and often effectively denied normal labour protections. This undermines overall productivity performance (although it is good for profits), including by lessening the pressure on employers to invest in labour-saving technologies when labour is scarce. Employers' overstated complaints about a supposed labour shortage in the initial years after COVID lockdowns led governments to significantly expand intakes of migrant labour, and this likely contributed to slow

[31] Calculations from Reserve Bank of Australia, "Australian Economic Statistics 1949-1950 to 1996-1997," Occasional Paper No. 8 Table 4.3.

productivity growth in this period. More recently, immigration intakes are returning to pre-pandemic norms, so this effect on productivity will likely dissipate.

The sluggish performance of wages in recent years has also undermined the incentive for employers to enhance labour productivity. The advent of various non-standard and insecure forms of employment (including irregular, temporary, agency, and contract labour) allows employers to access labour while offloading the risks and costs associated with fluctuating business conditions. Again, when contingent labour is readily and inexpensively available, employers can organise business models around its continued use. At the extreme, platform models of employment (such as gig-based passenger, food, and package delivery systems) allow employers to maintain ready supplies of contingent labour at no cost whatsoever. Since the time workers spend waiting for an incoming job is not compensated, businesses like Uber and Lyft have no incentive to try to use their workers' time more efficiently. Is it to the firms' advantage, in fact, to have thousands of drivers waiting idly, unpaid – to facilitate faster service when new tasks are assigned.

For all these reasons, building an economy in which labour is valued, protected and fully utilised, rather than being wasted and cheapened, is critical to a high-productivity economy. This requires a strong commitment to full employment at the macroeconomic level, backed up with strong protections and institutions to ensure labour is protected and fairly compensated in all circumstances. This will close the door on some of the most wasteful and unfair employment practices of employers – boosting productivity, but more importantly improving fairness.

Part III: Work, wages, and productivity

Most entreaties to improve productivity performance assume that higher productivity will naturally and automatically lead to higher wages and better living standards. In fact, many commentators treat productivity and living standards as synonymous. For example, as the Australian Bureau of Statistics notes, "Increases in labour productivity are often regarded as an indicator of improvements in aggregate living standards."[32] Assistant Minister Leigh puts it more unequivocally: "The main driver of how much people earn is how productive they are… It's at the heart of household living standards."[33]

Productivity measures how much is produced, from a given quantity of inputs. Labour productivity, the most common measure (to which these and other commentators refer) measures how much real output is produced from each unit (hour or year) of labour input. There is a big difference between what workers *produce*, and what they *get*. Much of what they produce is diverted to other uses and recipients. The extent and direction of that redirection evolves over time, reflecting a mix of economic, technological, and political factors – including, obviously, things like labour laws and standards, collective bargaining, taxes, and income security programs.

Billionaires are not rich because they are super-productive. And low-wage workers are not poor because they are unproductive. Income inequality reflects a myriad of economic, institutional, and structural forces – including how much power respective individuals and constituencies have to protect and advance their interests. Claiming that incomes are mostly determined by productivity not only misportrays the reality of how the economy actually functions – blaming the victims of poverty and inequality, for their supposed productivity failures. It also disregards the complementary measures and structures that would be required to ensure that productivity growth indeed enhances the well-being of the people who produce it.

[32] Australian Bureau of Statistics, "Labour Productivity," Labour Statistics: Concepts, Sources and Methods, 2023, https://www.abs.gov.au/statistics/detailed-methodology-information/concepts-sources-methods/labour-statistics-concepts-sources-and-methods/2023/concepts-and-sources/labour-productivity#gross-domestic-product-per-hour-worked.

[33] See Mike Seccombe, "Andrew Leigh's Productivity Plan," *The Saturday Paper*, 14 June 2025.

PRODUCTIVITY DOESN'T TRICKLE DOWN, AND THE LABOUR MARKET ISN'T A SMORGASBORD

A revealing example of the naivete with which many productivity discussions approach distributional issues was provided in the Productivity Commission's most recent *Quarterly Productivity Bulletin* (for June 2025). In it, a Commission researcher presented a supposed "choice" which societies are privileged to make when productivity is growing.[34] The report notes that higher productivity can be associated with producing more output with the same amount of work, or producing the same output with less work, or some combination of the two. In Australia's case, it is argued, most of the productivity "dividend" since 1980 (77%) was appropriated via higher real incomes and material consumption, while a small share (23%) took the form of shorter working hours and hence more leisure time. The Commission interprets this outcome as a natural reflection of the collective "preferences" of Australians: we put some value on leisure time, but more emphasis on higher material consumption. Other countries, it is argued, make different "choices". In the U.S., for example, measured productivity growth has been faster, but working hours remain among the longest of any OECD country. In the Productivity Commission's view, this "choice" apparently reflects a national proclivity for material consumption: "Americans are more inclined to work longer hours in exchange for more and better things" (Das, 2025, p.4).[35] In sum, the labour market is like a smorgasbord, with lots on offer: private consumption (via higher wages), public consumption (through stronger public programs), or leisure time. Stronger productivity growth makes this choice all the more appealing, allowing diners to select more of everything on offer: more leisure, more stuff, or some of both.

This rose-coloured view of how the labour market works is derived from the equally unrealistic neoclassical theory of labour markets. In this theory, labour supply reflects a free, voluntary decision by each individual worker about their personal trade-off between leisure time and the disutility of work. Workers are then compensated for the disutility of working by a wage, which in equilibrium will perfectly match the perceived

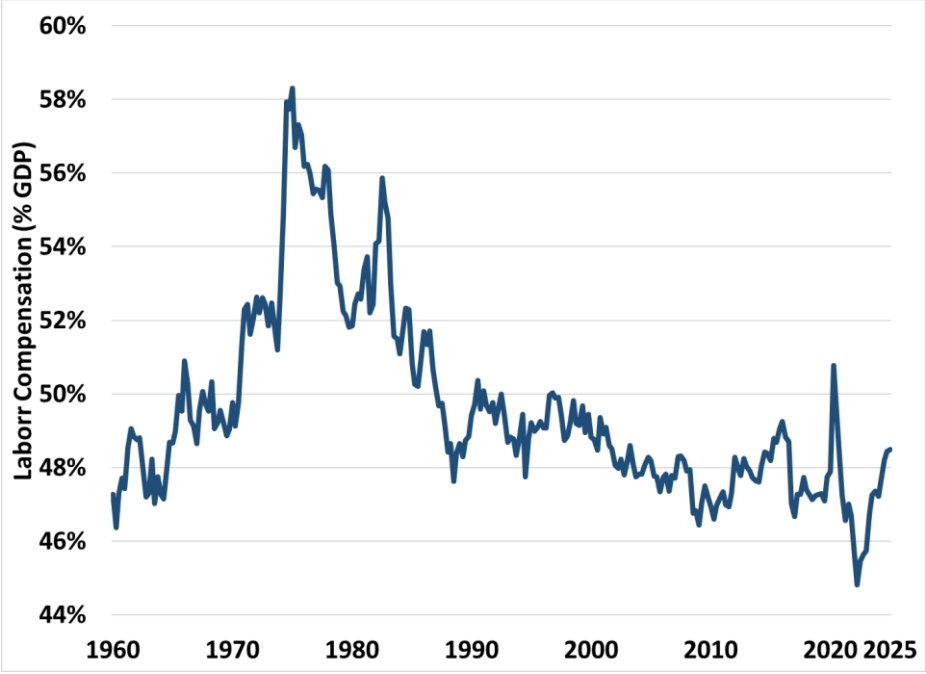
[34] See Rusha Das, "All work and no play: Productivity and the choice between money and leisure," *Quarterly Productivity Bulletin*, Productivity Commission, June 2025.

[35] The claim that American workers somehow freely choose to work longer hours in order to get more "things" is especially jarring: with a federal minimum wage of $7.25 (U.S.) per hour, unchanged since 2009, almost non-existent collective bargaining in many states, and the highest incidence of low-wage employment in the industrial world, tens of millions of American workers beg for every hour of employment they can get just to survive – not to get "more and better things". Low-wage American workers have neither leisure time nor a good standard of living, despite America's vaunted productivity performance, and this should serve as a stark warning to Australians about undue pursuit of productivity for its own sake.

value of an extra hour of leisure time (the opportunity cost of working). Competition between buyers and sellers of labour, and a flexible wage which fluctuates to equalise labour supply and demand, ensure that workers can effectively sell every hour of labour they wish to offer, at the given market-determined wage. This depiction of how wages and working hours are determined fits nicely with the "smorgasbord" theory of productivity growth enunciated by the Productivity Commission. But it bears no relationship to the reality of employment and wage determination in Australia, for several reasons.

First, the Productivity Commission's analysis depends on an assumption that the combination of higher wages and reduced working hours perfectly exhausts the full value of the supposed dividend arising for workers from productivity growth. In other words, the sum of reduced hours and improved real incomes is assumed to fully and proportionately rise with productivity growth. That assumption is equivalent to assuming that the share of total output going to workers (whatever their productivity) remains the same over time. But that assumption is false: there have been important and lasting changes in the distribution of income in Australia during the period covered by the Productivity Commission's simulation. In 1980, labour compensation (including wages and salaries, employer superannuation contributions, and other compensation) averaged 52.4% of GDP (see Figure 13).

Figure 13. Total Labour Compensation as a Share of GDP, Australia, 1960-2025



Source: Calculations from ABS Australian National Accounts: National Income, Expenditure and Product (Table 7).

By 2024 the labour share of national output had declined to 47.9%. That 4.5 percentage-point reduction translates into a loss of $125 billion per year in labour compensation in 2024 – or almost 10% of the compensation which workers receives in 2024. That part of the "dividend," representing one-tenth of total compensation, was entirely sucked away from workers. The Productivity Commission analysis ignores the impact of the significant redistribution of income in Australia throughout the last half-century of harsh business-oriented policies.

It's not hard to figure out where that missing productivity dividend went. The share of gross corporate profits in total GDP rose dramatically over the same period, by over 8 percentage points (from 17.6% in 1980 to 25.7% in 2024).[36] Over half of that growth in the relative size of corporate slice of Australia's GDP pie came at the expense of workers. The rest came from other constituencies (notably a major decline in the share of GDP going to mixed income of small businesses). Gross corporate profits in 2024 were about $225 billion (or almost one-third) higher thanks not to efficiency and productivity growth, but rather to a historic redistribution from the incomes of other stakeholders in the economy (especially labour). Simply assuming that productivity benefits are equally and proportionately shared throughout society is clearly unfounded.

Second, the decline in average working hours in 1980 can hardly be ascribed to a voluntary choice by Australians to trade off less growth in real incomes for more leisure time. The standard workweek has hardly changed since 1980: it was reduced to 38 hours (from 40) in 1983 and has not changed since. Average hours worked per employee have indeed declined: by about 10% from 1980 through 2024. But that is almost totally due to the dramatic rise in the incidence of part-time work – which almost doubled in this time, from 15.9% on average in 1980 to 31.0% in 2024.[37] Hours of work for full-timers have hardly changed: falling just 3% from 38.8 hours per week to 37.6 hours per week.[38] Average weekly hours for full-time workers actually increased significantly in the 1990s, when Australia's productivity growth was strongest – the opposite of the presumed trade-off between work and leisure.

Rather than representing a new "freedom of choice" for productive Australians, the growth in part-time employment mostly reflects negative aspects of Australia's labour

[36] Calculations from ABS Australian National Accounts: National Income, Expenditure and Product (Table 7).

[37] Calculations from Australian Bureau of Statistics, Labour Force Australia, Tables 1 and 19.

[38] This measure must be interpreted cautiously, since ABS data on full-time employment and hours only includes workers who work 35 or more hours per week. To the (small) extent that some jobs are full-time in meaning but have regular hours below 35 per week (say, a four-day 32-hour work week), this data will overstate average hours of work for qualitatively-defined full-time workers.

market. Most important is the absence of accessible quality early childhood education and care services, which limits the ability of parents (especially women) to accept full-time roles, and the growth of non-standard and insecure jobs (which often offer only part-time and irregular hours). Australia was once renowned for leading the global movement toward shorter working hours – as symbolised by the historic 8-8-8 stonemasons' strikes in the 1850s, and pioneering efforts in the twentieth century to establish legal protections that limited working hours. In recent decades, however, that progress has effectively stopped short, despite efforts by some trade unions and other advocates to rekindle interest in shorter working hours. Portraying the post-1980 reduction in average working hours as a voluntary preference of Australian workers for leisure reveals a deep disconnect between the idealistic theorising that goes on at the Productivity Commission, and the harsh, conflictual reality of what it takes to find and keep a job in Australia's real-world labour market.

Meanwhile, on the wages front, the weak growth of nominal hourly wages in Australia through much of recent history, and steep declines in real hourly wages since the COVID pandemic (discussed further below), disprove the assumption that higher productivity will translate into higher hourly wages at all. In that case, the supposed "choice" of individuals to pick higher incomes, more leisure time, or some combination of the two has been reversed entirely. To the contrary, the failure of wages to keep up with the cost of living, let alone rising proportionately (in real terms) with labour productivity, means Australian workers face the worst of both worlds: they have to work *more*, in a desperate attempt to stop their real standard of living from *falling* even further. That's the exact opposite of the happy win-win smorgasbord that exists only in the theoretical world of the Productivity Commission. Workers know full well that their wages do not automatically grow with the productivity of their industry, their workplace, or themselves. Regurgitating unfounded neoclassical assumptions that a rising productivity tide will lift all boats, only adds to the cynicism with which so many Australians rightly respond to this debate.

In extreme cases, high apparent productivity can even lead to *lower* wages – depending on how higher productivity is achieved, who captures the benefits of that productivity, and how the resulting spending translates into overall price levels. For example, some cities or regions with a concentration of high-productivity industries (like technology or finance) can actually see real wages for median workers fall. In these cases (like the technology cluster around America's Silicon Valley), most of the gains from super-profitable tech or finance activities are captured by investors and top executives. Meanwhile the cost of housing, transport, and other essentials is bid upward in these booming centres, driving down real wages and making life unaffordable for most of the people who live and work there. The success of high-

productivity industries, if the resulting gains are not purposely shared, can thus undermine quality of life for the majority – the exact opposite of what is predicted by "trickle-down" theory.[39] This reinforces skepticism regarding the common assumption that productivity and living standards are one and the same thing.

PRODUCTIVITY AND WAGES

The relationship between productivity and wages is neither automatic nor proportional. In conventional free-market economic theory, factor prices (including wages and profits) are supposedly determined by efficient, market-clearing competition in the markets for labour, capital, and other factors of production. Assuming perfect competition (so that all buyers and sellers, both employers and workers, have to accept the "going" wage rate), this will ensure that all workers have a job, and all are paid according to the value of their marginal productivity. This abstract theory is the intellectual basis for the common belief that workers are paid according to productivity – and hence higher productivity automatically means higher wages.[40]

This conventional free-market vision of the labour market obviously does not describe how employment, wages, and conditions are determined in the real world. There are many reasons why neoclassical economic theory does not apply to wage determination in practice:

- The labour market does not "clear", unemployment is a normal feature (and, indeed, powerful measures – like interest rate hikes from the Reserve Bank – are applied to *ensure* that a desired level of unemployment exists).
- Since labour supply almost always exceeds labour demand, wages cannot be explained by the level at which labour supply and demand are equal.

[39] These perverse outcomes are documented and explained in David Hearne and Paul Lewis, "Challenging (mis)understandings of labour productivity for levelling-up: a broader research agenda for regional development," *Contemporary Social Science*, 19(4), pp. 447-468, 2024.

[40] Strictly speaking, the neoclassical conclusion that workers will be paid according to the value of their marginal productivity is not equivalent to assuming that average wages will tend to rise proportionately with average labour productivity (and hence that labour's share of total GDP will be constant). Average wages, productivity, and factor shares also depend on many other factors, such as changes in the factor intensity of production, returns to scale in production, and other parameters. Nevertheless, this neoclassical theory has become an ideological shorthand for the generic assumption that wages naturally reflect productivity.

- Perfect competition is not applicable to the labour market. Large employers are able to directly influence the wages they pay through their own hiring and wage policies (rather than "taking" whatever price is set in the overall market).
- Non-market forces (such as minimum wages, collective bargaining, social norms, and historical patterns) strongly influence wages. When those non-market forces change, wages will change – with no necessary relationship to productivity.

Historical experience confirms that the relationship between productivity and wages in Australia is imperfect and flexible. There are many different ways to measure labour compensation and how it changes over time, including how to measure changes in the real purchasing power of wages (or real wages). Figure 14 illustrates two such choices, along with the trend in labour productivity (conventionally measured by real GDP per hour of work). The ABS national income accounts report a measure of employee compensation per hour of work (in current nominal dollar terms). That can be converted into real values by deflating by the overall level of output prices, as reported by the implicit GDP deflator.[41] The resulting real wage measure is known as the "producer wage", since it represents the real value of wages relative to the average price of output. It is often considered most relevant for employers or producers, concerned with how much they are paying for labour relative to the revenue they receive for their output.

Another common measure of wages is the Wage Price Index (WPI). It measures changes in wage costs across a fixed basket of jobs (analogous to how the Consumer Price Index measures changes in prices for a fixed basket of consumer goods and services). The WPI does not reflect changes in the composition of work (across industries, or between different types of job), and hence is a more focused measure of true wage inflation. For workers, the real purchasing power of wages depends on the prices of consumer goods and services which they buy. So, from their perspective, real wages could be estimated by deflating the WPI by the CPI. This is called the "consumer wage".

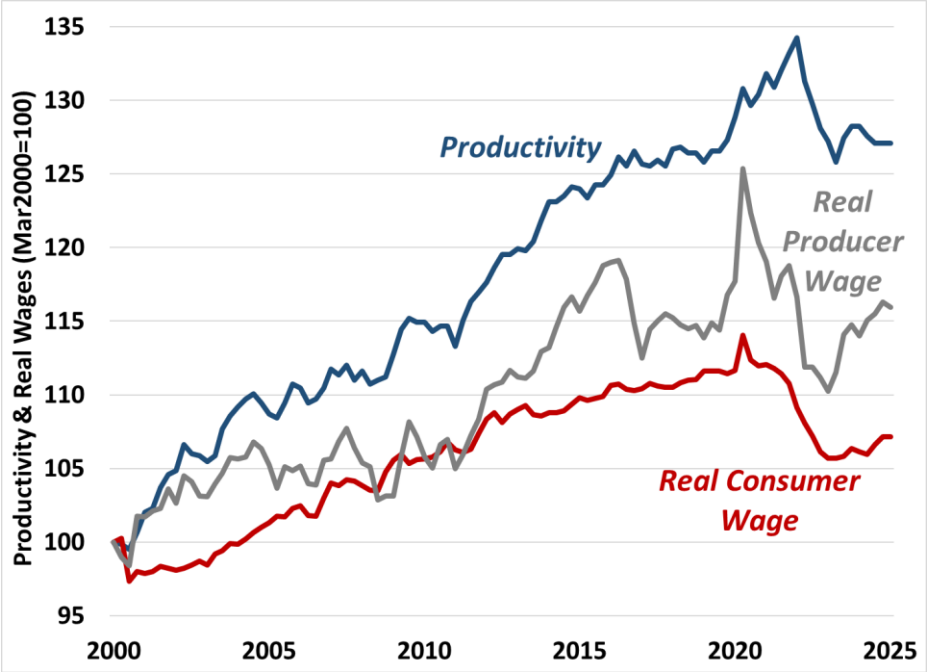
The evolution of both of these measures of real wages since the turn of the century is illustrated in Figure 14, alongside real labour productivity (GDP per hour, reported directly by ABS's National Accounts data). Of course, various other measures of real

[41] The implicit GDP price deflator is an index that equals the ratio of nominal GDP to real (inflation-adjusted) GDP, and is a measure of the average price level for all goods and services produced in the domestic economy.

wages could be computed: using different combinations of nominal wage measures[42] and price deflators. There is no compelling rationale to choose any one particular combination. But the general pattern is clear: real wages have lagged substantially behind real labour productivity for many years.

[42] Other alternative measures of nominal wages include ABS series on average weekly earnings, compensation from the Labour Account, and data from the Employee Earnings report.

Figure 14. Labour Productivity and Real Wages, 2000-2025



Source: Calculations from ABS Australian National Accounts: National Income, Expenditure and Product (Tables 1, 4 and 24), Wage Price Index (Table 1), and Consumer Price Index (Table 1).

Since March 2000, real labour productivity has grown two-thirds faster than the national accounts measure of wages deflated by overall GDP prices. Productivity grew 27% in this time, compared to 16% for real (producer) wages. Meanwhile, productivity growth was almost 4 times faster than WPI wages deflated by consumer prices (which rose only 7% since the turn of the century). Whichever wage and price measures are chosen, productivity has clearly grown much faster than real wages. If our measure of real consumer wages (WPI deflated by the CPI) had grown as fast as labour productivity since 2000, wages would be more than 18% higher today than they are. That would translate into about $350 per week (or $18,000 per year) in additional wage income for an average worker. If our measure of real producer wages had grown as fast as productivity, wages would be 10% higher than they are, translating into $182 per week in additional earnings, or about $9500 more over the past year.[43]

Because the shortfall in real wage growth relative to productivity growth has persisted for many years, these estimates understate the true extent to which workers' compensation has been suppressed what would have occurred if wages had grown in

[43] Calculations based on application of the proportionate shortfall in cumulative real wage growth relative to productivity growth as of March 2025 (compared to the March 2000 starting point), applied to average compensation per employee hour and average hours worked per worker (from the ABS Labour Account) in March 2025.

tandem with productivity throughout this period. Each year in which real wages lag real productivity adds to an accumulating "productivity debt," which can be thought of as the cumulative additional compensation "owing" to workers as a result of this ongoing undercompensation.[44] By the standards of the producer wage, that productivity debt sums to $135,000 per worker since 2000. By the standards of the consumer wage (which performed worse during this time than the producer wage), the debt sums to over $200,000.[45]

This cumulative underpayment is not solely a matter of historical injustice, either. The value of this "debt" continues to accumulate so long as real wages remain below the level they would be if productivity gains had indeed fully flowed through into wages. Moreover, this analysis also refutes the standard business argument (frequently echoed by RBA officials) that real wages must not grow faster than productivity lest inflation be spurred or profit margins squeezed. Real wages grew more slowly than productivity almost continuously over the past 25 years. It is certainly the case that they could now grow faster than productivity for a considerable period of time. The profit share of output would indeed decline. But it would take many years for it to fall back to where it was in 2000 (let alone in earlier periods when it was even lower). Using the producer wage, real wages could grow by a full percentage point faster than productivity each year for the next decade, until the profit share of output returned to its 2000 level (and the proportional relationship between real wages and real productivity regained its 2000 starting point). By the standard of the consumer wage, it would take 18 years until that year-2000 distributional balance was restored. Real wages have been suppressed relative to productivity in Australia for a generation; restoring distributional norms would require many years of undoing that wage suppression. The assumption that future productivity growth establishes a ceiling on future real wage growth assumes that the historic redistribution of income that has occurred in Australia between workers and their employers is now set in stone and cannot be reversed. This is neither economically nor morally credible.

[44] The author is indebted to Joseph Mitchell for suggesting this concept. Graphically, the "productivity debt" reflects the cumulative area between the productivity line and either of the two real wage lines in Figure 14.

[45] It is interesting to note that former Treasury Secretary Ken Henry, in a recent address to the National Press Club, pursued similar logic in estimating that cumulative wage payments for a typical Australian worker since 2000 were $500,000 lower than they would have been if productivity had continued growing at 1990s average rates (of over 2% per year) *and* if those productivity gains had been fully and proportionately reflected in wages (see John Kehoe, "Ken Henry says you should be half-a-million dollars richer," *Australian Financial Review*, 16 July 2025). Both assumptions are far-fetched – the latter, as we have shown, especially so. In contrast, our estimation of the "productivity debt" is calibrated to that productivity growth which did occur in reality.

There are many reasons why ongoing productivity growth may not fully translate into real wage gains for typical workers. Key explanatory factors include:[46]

- *Differences in inflation between consumer goods and services, and the rest of the economy.* Real productivity is measured by deflating output by the overall GDP price level, whereas real consumer wages are measured by deflating by consumer prices (since that is what determines the standard of living of workers). When consumer prices grow faster than output prices (for example, due to rapid increases in re-sale housing costs, which are not counted in GDP price deflators since resale houses are not part of current production), then real consumer wages will grow more slowly than real producer wages.

- *Falling share of GDP received as labour compensation*. When workers lack the institutional power to negotiate wages that keep up with the economy, their share of each dollar of output will fall over time – as has been the case since the 1970s (shown above in Figure 13). If workers are receiving a smaller share of each dollar of real output over time, then productivity growth will not be fully reflected in workers' incomes.

- *Increasing inequality in incomes between different groups of workers*. Income gaps have grown between well-paid senior executives and specialists, and lower-paid non-supervisory and production workers. Salaries for very highly-paid employees (including executives) are included in the ABS's tally of "labour income." They are high enough to pull up the seeming average level of wages and salaries – but are not typical of compensation for most workers. Median wages (paid to the worker at the mid-point of the wage ladder) have grown slower than average wages in Australia since the turn of the century, reflecting a growing gap between high-income workers and the rest of the labour force. This means that average compensation data (such as portrayed in the grey line in Figure 14) is less reflective of compensation for typical or median workers (which is likely closer to the red line in Figure 14).

For each of these various contributors to the growing gap between productivity and real wages, there are corresponding policy responses that could help strengthen real wages and better ensure that productivity growth translates into better living

[46] These factors are catalogued and reviewed in the U.S. context by Lawrence Mishel, "Growing inequalities, reflecting growing employer power, have generated a productivity–pay gap since 1979," *Working Economics Blog*, Economic Policy Institute, 2 September 2021, https://www.epi.org/blog/growing-inequalities-reflecting-growing-employer-power-have-generated-a-productivity-pay-gap-since-1979-productivity-has-grown-3-5-times-as-much-as-pay-for-the-typical-worker/.

standards – rather than just assuming that this happens automatically. Measures to address the divergence between productivity and wages, and thus better share the gains of rising productivity, could include:

- Pro-active policies to reduce the costs of essential consumer products (like housing, energy, and groceries) for working families, so that consumer prices rise more slowly than wages.

- Strengthening collective bargaining and wage regulations (such as higher minimum and Award wages), to give workers more institutional power to demand and win higher wages as productivity grows, and to rebuild workers' share of total GDP.

- Limits on excessive compensation for top executives and other super-high-income individuals, to reduce the share of GDP flowing to the highest income segments of society, and complementary measures to ensure lower- and medium-income workers' real incomes grow in line with overall productivity (like stronger Award and minimum wage policies).

The key point here is that there is no automatic "trickle-down" effect that ensures average workers benefit proportionately from improved labour productivity. Rather, it takes pro-active and deliberate measures to *ensure* that the benefits of efficiency and innovation are shared broadly.

Australia's experience in the initial postwar decades embodied a commitment to sharing the gains of productivity growth. Between 1950 and 1980, real GDP per worker and real incomes per worker grew broadly in tandem: real output per hour almost doubled over this period, and real incomes for workers grew even faster (more than doubling over the same time). Strong policies were implemented to make sure that postwar prosperity was shared – including through the Awards system and strong unionisation. Workers' share of the economic pie grew during that period (from 45.0% of GDP in 1950, to 52.4% in 1980). The increasing labour share of GDP gave rise to exaggerated business concerns about a so-called "wage overhang": the idea that wages were too high relative to productivity. This perspective has strongly influenced macroeconomic, labour, and social policy for the last generation – with the goal of suppressing wage growth and enhancing profits. Those policies "worked": by the onset of the pandemic, the labour share of GDP had fallen to levels not seen since the 1950s, and real wages (as shown above) were consistently lagging productivity.

More recently, important reforms to labour policies and collective bargaining rules (including recent strong increases in minimum and Award wages, measures to close loopholes in employment standards, new provisions to allow for multi-employer

enterprise bargaining, and targeted measures to lift wages in undervalued sectors like aged care and early child education and care) are reversing that trend. Wage growth has picked up notably in the last two years, and the labour share of GDP has regained some lost ground. However, to reinforce public confidence that future productivity growth would actually make a difference in the lives of most working people, those measures need to be solidified and expanded. A strong commitment to sharing the gains of productivity growth is just as important as making efforts to accelerate productivity growth in the first place. Without the former, the latter has little relevance for workers.

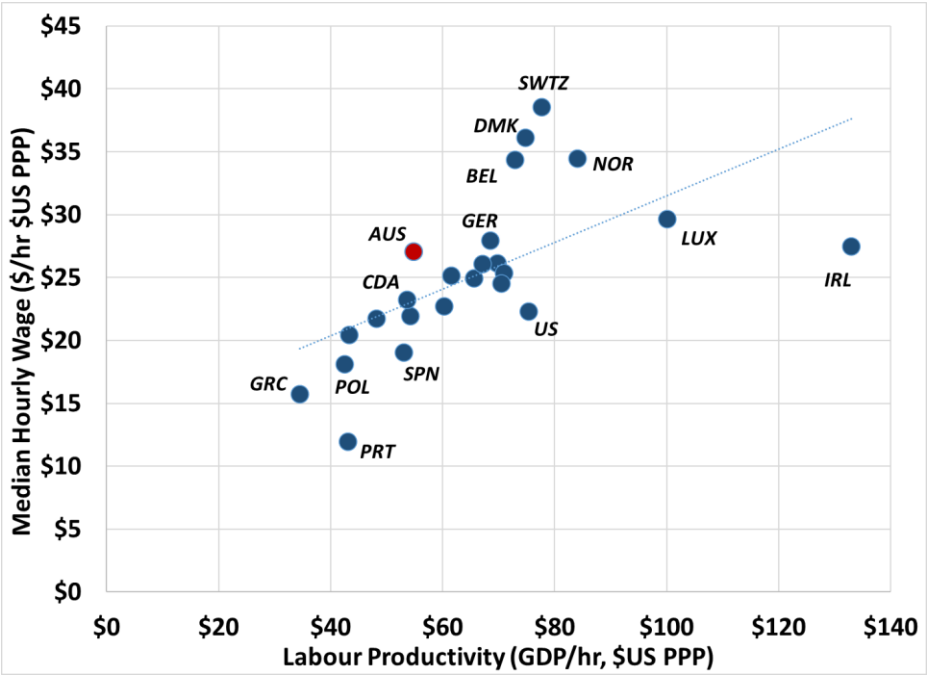
The very imperfect relationship between wages and labour productivity is also clear in comparative international data. Of course, wage levels tend to rise with a country's general level of economic development, and that fact alone creates a broad correlation between productivity and wages across countries with different levels of development. However, among advanced industrial countries (which encompass generally similar levels of overall development), wage patterns vary greatly – reflecting differences in the structural and institutional determinants of income distribution. Some countries deliberately try to ensure that the fruits of productivity are shared widely and relatively equally. Other countries resist efforts by workers to win higher wages (even if productivity is growing), in the interests of enriching well-off investors, owners, and executives.

The contrast between Australia and the United States is compelling in this regard. Australia's average labour productivity is only 70% of U.S. levels. Yet median hourly wages in Australia are 20% *higher* (evaluated at purchasing power parity exchange rates) than in the U.S.[47] American wages are deliberately suppressed by measures such as harsh restrictions on union activity, a 16-year freeze in the federal minimum wage (which has languished at just $7.25 U.S. per hour since 2009), and rock-bottom income support programs (which compel people to accept work even at very low wages). Some productivity advocates want Australia to mimic U.S. policies, in order close the gap with U.S. productivity. However, American economic and social policies suppress incomes and living standards for most workers. The U.S. model, as a "complete package," would thus leave most Australians worse off, even if productivity grew significantly.

[47] Calculations from OECD Data Observer, Productivity Levels and Annual Purchasing Power Parities; Australian Bureau of Statistics, Employee Earnings, Table 1; and U.S. Bureau of Labor Statistics, National Occupational Employment and Wage Estimates. Wage level for Japan is average, not median, due to lack of data.

Figure 15 illustrates the imperfect relationship between productivity and median wages across a broader sample of 24 high-income OECD economies. A positive relationship between wages and productivity is visible across this class of economies (illustrated by the linear trend line in Figure 15), but it is weak. Some countries (like Belgium, Denmark, and Switzerland) support wages that are much higher than countries with equal or superior productivity (such as Ireland, Luxembourg, and the U.S.). Countries located below the trend line demonstrate weaker wages than their productivity would suggest (including the U.S., Spain, Portugal, and Greece). Some others (like Germany) do a relatively better job of translating productivity into higher wages. Australia is also located above the trend line, reflecting the effectiveness of institutions like the Award system, a strong minimum wage, and (in some industries) collective bargaining in enhancing the wage share of output, and making sure it is distributed more equally between workers (thus lifting the median).

Figure 15. Labour Productivity and Median Wages, High-Income OECD Countries, 2022



Source: Calculations from Eurostat, OECD, and national statistical sources.

Even for countries located close to the trend line, the transmission of higher productivity into higher median wages is imperfect and partial. A linear regression of median wages on productivity suggests that less than one-fifth of cross-national gains in average productivity in this sample are reflected in higher median wages. Cross-national differences in productivity only explain slightly more than one-third of cross-national differences in wages (see Table 2). Cross-national differences in median wages are mostly explained by things other than productivity, including the institutions of

wage regulation and collective bargaining. This evidence directly refutes the blithe assumption that productivity is the dominant determinant of living standards.

Table 2 Linear Regression of Median Wages on Average Productivity High-Income OECD Economies, 2022		
	Value	**Std. Error**
Constant	12.95938	3.551843
Slope	0.185536	0.051528
R2	0.370795	
Observations	24	
Source: Calculations from Eurostat, OECD, and national statistical sources. Wages and productivity expressed in $US terms at purchasing power parity.		

In sum, higher productivity creates an economic possibility for higher wages. But it takes deliberate strategies, policies, and institutions to ensure that workers receive a fair share of productivity growth. This evidence constitutes a clear warning about the dangers of focusing on higher productivity as a goal in and of itself. There is no guarantee that higher productivity will indeed lift wages and living standards, unless strong measures are implemented simultaneously to ensure that productivity gains are shared – in the forms of higher wages, reduced working hours, and (via fair tax systems) public services and income supports.

PRODUCTIVITY AND INDUSTRIAL RELATIONS

A common talking point of business and employer lobby groups is that the efficiency of Australian workplaces is held back by costs, entitlements and work rules resulting from enterprise bargaining and union representation.[48] If we reduce or eliminate barriers to unilateral employer control over workplace practices and compensation, it is argued, the natural efficiency of private entrepreneurship will shine through.

A cursory examination of Australia's postwar productivity performance, however, invalidates those employer claims. The initial postwar decades (from the 1950s through the 1980s) represented the high point of Australian union activity and labour market regulation. Unions represented half or more of all workers, the Award system directly supported wages for most workers, and work stoppages were relatively

[48] A recent representative example of this line of argument is "The roundtable needs to be Labor's 'Nixon in China' IR moment," Editorial, *Australian Financial Review*, 16 July 2025.

frequent. That might sound like a productivity disaster for employers – but it turns out those were also the decades of Australia's strongest postwar productivity growth (see Table 3). Labour productivity grew by over 2% per year from 1950 through 1980 – and real wages grew even faster, supporting a doubling of real incomes for Australian families.

Table 3
Industrial Relations Indicators and Productivity Growth
1950-2024

	Average Union Density (% Employment)	Average Minimum Wage as % Median Wage	Days Lost in Industrial Disputes per 1000 Workers	Average Annual Productivity Growth (%/yr)
1950-1980	46%	80%	332	2.2%
1980-2000	39%	57%	217	1.7%
2000-2024	19%	55%	20	1.0%

Source: Calculations from ABS *Year Book Australia*, "Industrial Disputes" (Table 2b), "Trade Union Membership" (Table 1), and "National Accounts: National Income, Expenditure and Product" (Table 1); RBA "Australian Economic Statistics 1949-1950 to 1996-1997," Occasional Paper #8, June 1996; OECD Employment and Labour Market Statistics; Jim Stanford, "'Fair Go' No More: Australian Neoliberalism and Labour Market Policy," in Damien Cahill and Phil Toner (eds.), *Wrong Way: The Legacy of Reform* (Carlton: Black Inc., 2018); and Jim Stanford, *Historical Data on the Decline in Australian Industrial Disputes* (Canberra: Centre for Future Work, 2018).

Big changes in labour and industrial laws quickly altered those collective bargaining and wage outcomes. Union density declined as a share of total employment – in large part because of new restrictions on membership provisions in enterprise agreements. The Awards system was converted into a minimum safety net, no longer serving as a more comprehensive system for lifting wages across the economy. Work stoppages became much less frequent. Perhaps surprisingly, productivity growth slowed down.

Since the turn of the century, productivity growth has averaged less than half as fast as during the 1950-19980 postwar boom. Yet days lost to industrial disputes are down by over 90% (as a share of all days worked). The "bite" of Australia's minimum wage (measured relative to median wages) has fallen by one third. Union density has declined by over half. By any measure, Australia's labour market is a more deregulated, employer-friendly arena than during the postwar expansion. Yet despite this – or perhaps because of it – productivity growth has never been worse.

Industrial laws are at most a secondary factor in the determination of productivity growth. Some employers might hope that deunionised workplaces can be more "productive", because employers have more unilateral control to allocate labour, speed up production, upsize and downsize employment quickly and costlessly, and take other steps to extract more labour effort from each paid hour of work. These can be important for boosting profits, but less so for genuine productivity. There are obvious limits to how much productivity can be improved by just "speeding up" work.

On the other hand, it can be argued that stronger unions and bargaining practices boost productivity growth by providing workers with more security in their jobs, and establishing secure channels of input and negotiation. When workers have a say and know their jobs will not be jeopardised by speaking out, workplaces can benefit from input and ideas generated by the people actually doing the work. And by negotiating wage gains and job security measures, union-covered workers have more confidence that productivity gains will be shared (rather than translating into speed-up and job loss). Again, while this relationship between collective representation and productivity might be positive,[49] it is clearly secondary to the other determinants of productivity discussed above (such as capital investment, innovation, and capacity utilisation).

Historically, there is no evidence to suggest that the general tone of industrial laws has any consistent impact on productivity growth. The advent of enterprise-level bargaining in the 1990s is often celebrated as one of the causes of relatively stronger productivity growth that decade (compared to the 1980s) by allowing employers to customise wages and work practices more closely to the circumstances of particular firms. But that credit is likely not fully deserved. Other factors, such as recovery from the harsh recession of the early 1990s, also contributed to stronger productivity numbers in the mid-1990s.[50] Howard-era reforms which rolled back the power of unions and enhanced employer freedoms had no positive impact on productivity, and the implementation of the Fair Work Act under the ALP in 2009 had no measurable impact, either. Productivity growth decelerated more substantially during the long economic slowdown of the 2010s, when three successive Coalition governments made further employer-friendly changes to labour laws. Swings in productivity since 2020 have been dominated by the COVID pandemic and its aftermath. From the long-run perspective, there is no consistent correlation between productivity growth and the

[49] Evidence attesting to a positive correlation between union representation and firm-level productivity is provided by Thomas A. Kochan and William T. Kimball, "Unions, Worker Voice, and Management Practices: Implications for a High Productivity, High-Wage Economy," *Russell Sage Foundation Journal of the Social Sciences* 5(5), (2019), pp. 88-108.

[50] As discussed above, higher capacity utilisation is a powerful driver of stronger productivity growth, and capacity utilisation improved dramatically as Australia came out of the 1990s recession.

general tilt of industrial laws, in either direction. Nor is there any consistent correlation between productivity growth and the political party in power, regardless of claims made by partisans on either side.

Even the Productivity Commission itself, despite its general faith in neoclassical market-oriented theories of employment and wages, could not find a link between industrial laws and productivity growth, in its special 2016 report on Australia's workplace relations system:

> There is little robust evidence that the different variants of [workplace relations] systems over the last 20 years have had detectable effects on measured economywide productivity.[51]

Clearly, productivity growth is a complex outcome of numerous cyclical, structural, and institutional factors shaping the way Australians work, innovate, and are compensated. The industrial relations system is more relevant for managing how the gains of productivity growth are shared, and for limiting the extent to which employers can pursue productivity (and, more to the point, profitability) through measures incompatible with long-run well-being of workers (such as intensification of work, unsafe working conditions, or very insecure employment arrangements). In that regard, stronger labour protections and collective bargaining are complementary to a more genuine strategy for boosting productivity growth.

[51] Productivity Commission, *Workplace Relations Framework* (Canberra: Productivity Commission, 2015), p.9.

Part IV: Improving productivity and sharing the gains

The preceding discussion has highlighted several factors contributing to Australia's disappointing productivity performance in recent decades. This section discusses six broad policy themes that could help address those failures (summarised in Table 4) and strengthen productivity growth in future years. This discussion is limited to identifying high-level priorities for further research and policy development; specific policy proposals within each of these areas will require further dialogue and investigation. Finally, we stress again that a strong commitment to distributional measures to reliably convert future productivity gains into higher real wages and living standards is just as important as efforts to accelerate growth in the amount of output per hour of work.

Table 4 Strategies to Revitalise Productivity Growth and Share its Proceeds
Boosting investment and innovation
Building a more diversified, balanced, sustainable economy
Investing in people and skills
Enhancing physical and social infrastructure
Valuing labour… and paying for productivity
Reductions in working hours

BOOSTING INVESTMENT AND INNOVATION

No single factor is more correlated with Australia's productivity slowdown than the sustained weakness in Australian business investment in capital, machinery and equipment, and innovation. This weakness cannot be ascribed to a lack of profit or cash flow: as noted above, profits in the business sector have increased dramatically as a share of GDP in recent decades and reached all-time records as a share of GDP in the aftermath of the COVID pandemic. Perhaps surprisingly, those record profits have been associated with less investment, not more. The central role of weak business investment in weak productivity growth reinforces the general perspective that

responsibility for Australia's productivity problems rests first and foremost with the business sector – not with government, unions, or other stakeholders.

There is no single solution to the ongoing failure of Australian firms to invest sufficiently in the tools of productivity improvement: capital, machinery, technology, and innovation. Most business demands for subsidies, tax breaks, and regulatory relief are self-serving and should be resisted. Where fiscal tools can be revised to focus more incentive power on eliciting incremental investment (rather than further fattening bottom-line profits), this is worth considering. Examples could include:

- Investment tax credits focused on new spending in targeted industries or assets are more effective in eliciting additional investment spending than across-the-board corporate tax cuts.
- Higher taxes imposed on payouts of dividends, excessive executive compensation, and stock buyback programs would encourage firms to reinvest free cash flow, rather than paying it out to owners and CEOs.
- Joint investment and innovation projects (such as joint-venture partnerships with government investment agencies, like the National Reconstruction Fund) can amplify the flow of new capital in strategic or targeted sectors.
- Making public support for research, targeted infrastructure, or training assistance contingent on additional investment commitments by partnering businesses, can also elicit more investment effort from the private sector.
- Australia's industry superannuation funds could be encouraged to partner with businesses in expanding capital spending in key Australian industries.

BUILDING A MORE DIVERSIFIED, BALANCED, SUSTAINABLE ECONOMY

The sectoral composition of the economy has major implication for the trajectory of productivity. Countries with the highest productivity performance are generally those with a strong presence of higher-tech sectors, which demonstrate the fastest productivity growth. The erosion of technology-intensive manufacturing in Australia has clearly undermined investment in capital and research and contributed to slower productivity growth. Meanwhile, doubling down on the extraction and export of non-renewable resources (industries which have normally demonstrated declining productivity) will likely reinforce future productivity sluggishness.

There is growing awareness around the world that pro-active industrial strategies are needed to foster a larger domestic presence of industries that meet desirable criteria. Industries attracting this pro-active policy attention are generally those which embody technology-intensity, export orientation, an ability to anchor extended supply chains, and potential for strong productivity growth (and hence, potentially, income growth) over time.[52] This renewed worldwide interest in active industrial strategy has found reflection in recent Australian policy initiatives, including the Future Made in Australia framework and the Net Zero Economic Authority. The imperative to reduce greenhouse gas emissions and fulfil Australia's commitments to global net-zero targets adds impetus to this need for a stronger domestic presence of high-value, sustainable industries – industries that can both diversify and strengthen Australia's growth and exports, and simultaneously contribute to decarbonisation.[53] Strengthening Australia's industrial policy capacity, and mobilising the full toolkit of policy levers to support more value-added investment, production, and innovation here, must play a key role in the future productivity strategy.

INVESTING IN PEOPLE AND SKILLS

A highly trained and capable workforce is one of Australia's greatest advantages. However, Australia's education and training system has failed to deliver a steady pipeline of workers with the right match of skills for growing, innovative industries. The legacy of misguided vocational policy experiments over recent decades (in particular, the focus on privatisation and marketisation of vocational education) was the most important cause of that underperformance. Measures to improve the flow of skilled workers entering the labour force, and to ensure that all workers have opportunity and support to develop their skills throughout their working lives, are an important component of any well-rounded productivity strategy. Policy themes in this regard could include:

- TAFE institutes should be revitalised as the core pillar of vocational education in Australia, with renewed funding by state and federal governments, expanded

[52] Summaries of research confirming the benefits of strategic sector-focused development policy interventions include Joseph E. Stiglitz, Justin Y. Lin, and Celestin Monga, "The Rejuvenation of Industrial Policy," World Bank Policy Research Working Paper No. 6628 (Washington: World Bank, 2013); Dani Rodrik, "Normalizing Industrial Policy," Commission on Growth and Development Working Paper No. 3 (Washington: World Bank, 2008); and Mariana Mazzucato, *The Entrepreneurial State: Debunking Public vs. Private Sector Myths* (London: Anthem, 2013).

[53] For a summary of the global interface between industrial policy and emissions reductions, see Charlie Joyce, *A New Era for Climate Industrial Policy A Compendium of Recent Developments in Major World Economies* (Canberra: Carmichael Centre, 2023).

fee-free access, and capital funding to ensure TAFE students are trained on modern equipment and techniques. Impressive improvements in TAFE funding and fee-free spaces implemented in the last three years constitute a good start in this regard.

- Stronger study-work linkages (such as co-op placements and internships) should be established as part of TAFE programs and other training streams to achieve faster and better job matches for graduating apprentices and trainees.

- Apprenticeship, traineeship, and work placement positions need to be fairly compensated so that they are appealing to new students, and so that they can support themselves through the completion of their programs.

- Tax measures should aim to foster stronger employer support for in-house training. One option in this regard is a refundable training levy, through which employers are effectively required to invest a certain proportion of gross payroll in on-the-job training opportunities for staff, or else pay additional payroll taxes to offset some of the cost of public education and training). This "train or pay" approach was previously used in Australia and is still common in several European countries to strengthen employer training commitments.[54]

ENHANCING PHYSICAL AND SOCIAL INFRASTRUCTURE

While private industry has been the dominant cause of Australia's productivity disappointments, the public sector must play a strong supporting role in revitalising productivity growth. This will require a continued strengthening of investments in physical infrastructure, including transportation, communication, clean energy, and other utilities. After decades of austerity-inspired underinvestment in public capital since the 1980s, much of Australia's public capital stock is badly in need of modernisation and expansion. Australia's notoriously weak internet performance is a case in point. State and federal governments are making initial steps toward addressing this shortfall, but a more sustained public investment effort is required. Public capital spending should rise by at least another full percentage point of GDP, leaving it still well below the peak investment rates experienced in the initial postwar decades (and which contributed so much to the stellar growth of productivity in that era).

[54] For details see Carolina Torres, *Taxes and Investment in Skills*, OECD Taxation Working Papers No. 13 (Paris: OECD, 2012), Section 4.7.

Public innovation in investment is also important to complement the (inadequate) R&D efforts of Australian businesses. Public support for basic research in universities and other public institutions plays a vital role in stimulating new technologies and creating opportunities for more commercial technology development. Public investments should be reflected in ongoing equity stakes in technology spin-offs. Government investment agencies and superannuation funds could play a more active role in fostering industrial applications of new research.

Australia's social infrastructure is another vital ingredient in productivity success. Ensuring that workers and their families are able to build lives that are secure and healthy, fulfilling their human and economic potential, is crucial for sustained economic and social progress. A good example in this regard is the recognised importance of high-quality early childhood education and care (ECEC) for developing stronger learning and earning capacities among children who participate in these programs. Rigorous international evidence confirms that cognition, communication and social skills, future learning capacity, and general health and well-being are improved for children who receive ECEC through high-quality (preferably not-for-profit) group centres.[55] In this light, improving Australia's ECEC system (which lags most peer industrial countries in both scale and quality) is very much a productivity priority. Fiscal support for ECEC services should be expanded; costs to parents should be reduced; and wages and working conditions for ECEC workers further improved.

VALUING LABOUR… AND PAYING FOR PRODUCTIVITY

This report has shown that the conventional assumption that productivity improvements are automatically passed down to workers (in the form of higher real wages, shorter working hours, or both) is unfounded. Workers need bargaining power and institutional support to demand and win a proportional share of the extra value they produce through improved technology, work organisation, and skills. The failure to ensure that real wages rise in tandem with productivity in recent decades not only betrays the effort and investment that workers have put into more productive workplaces, it also dissipates the economic incentive for employers to continue to improve productivity. When real wages are growing slowly, or worse yet falling (as they did after the pandemic), labour is less expensive to employers. Employers are

[55] This research is reviewed in the Australian context by Australian Institute of Health and Welfare, "Literature Review of the Impact of Early Childhood Education and Care on Learning and Development," Working paper, Cat. no. CWS 53 (Canberra: AIHW, 2015).

thus discouraged from taking active measures to conserve labour (including through labour-saving technology).

Employers should face steady pressure to continually improve work practices and productivity and thus use each hour of labour as efficiently as possible. This incentive is reinforced when labour is in short supply, and when wages are robust and rising. Broad policy themes to help keep labour scarce and wages strong, thus spurring employers' interest in productivity, could include:

- Revising the Reserve Bank of Australia's operating framework to explicitly include pursuit of genuine full employment (not the "NAIRU") as an equal goal, alongside inflation control.
- Reforming the purpose of the Modern Awards system, to allow Awards to once again set new standards for higher wages across covered industries (rather than serving solely as a safety net).
- Increasing the national minimum wage (and corresponding Award wages) in real terms each year (above and beyond expected inflation), to support long-run growth in real wages across the labour market – and thus provide employers with a stronger incentive to improve labour productivity.[56]
- Strengthening rules regarding non-standard and platform work, to close remaining loopholes whereby employers can access labour without meeting minimum wages and other normal labour standards (such as the ability of platform businesses to avoid paying wages to workers waiting for new job assignments).

REDUCTIONS IN WORKING HOURS

As discussed above, the Productivity Commission pretends that Australians have a free choice about how to harvest the fruits of productivity growth – through preferred combinations of higher real incomes and more leisure time (via reducing working hours). That rose-coloured view of how Australia's labour market works should be dismissed. Higher real wages and reduced working time don't appear magically via the workings of the free market; rather, Australians have to demand and fight for them. And thanks to a lopsided industrial relations field, tilted in employers' favour, far too

[56] This suggestion is also made by Ross Gittins "Want greater productivity? Set wages to rise by 3.5 percent every year," *Sydney Morning Herald*, 19 May 2025.

many Australian workers have received neither higher incomes nor reduced working hours over the past austere decades.

Nevertheless, the potential of higher productivity to support reduced working time should serve as a motivation for productivity initiatives, so long as they are paired with a meaningful institutional commitment to achieving shorter work time. In recent decades the long historical process (which Australia once led) of work time reduction has mostly stopped. Reductions in average working hours now mostly reflect the growing incidence of (often insecure and/or involuntary) part-time work. Establishing shorter work time and more sustainable work-life balances should be an integral component of an overall productivity agenda. Policy themes to consider in this regard include:

- Better enforcement of regulations regarding payment to workers for overtime work; this will spur employers to make sure work is performed more efficiently within regular working hours (rather than spilling over into breaks, evening, and weekends, with no penalty for employers when this happens).
- Strengthening and fully enforcing Australia's new right-to-disconnect protections, so that workers are protected from unreasonable work interruptions during their off hours (and further reinforcing pressure on employers to get work done productively during regular hours).
- Expanding pilot programs for four-day work weeks and other working time innovations (including in public sector workplaces).
- Strengthening and extending provsions under the Fair Work Act so all workers can request flexible working arrangements (such as four-day weeks and remote work practices).

Conclusion

This paper has shown that productivity growth is not an end in itself, and on its own will not ensure that living standards for Australians rise over time. Higher productivity creates an economic foundation on which a prosperous, inclusive economy *could* be built. But measures to ensure that productivity is attained in fair and sustainable ways, and that its fruits are broadly shared, must take equal billing with trying to enhance output per hour. In that regard, the federal government's current focus on enhancing Australia's productivity must be paired with a continuing commitment to strengthening the institutions of wage determination and redistribution. That must include strengthening collective bargaining (including at multi-employer or industry-wide tables), higher minimum and Award wages, stronger labour standards (including for workers in insecure and platform jobs), and fixing the holes in Australia's inadequate system of income security (such as JobSeeker).

Australia's productivity performance, like most industrial countries, has been disrupted and damaged by the unique circumstances of the COVID pandemic and its aftermath. In that context, oft-repeated warnings about a productivity "emergency" are overstated, and should be treated skeptically. The restoration of normal economic conditions – including lower inflation, lower interest rates, renewed economic growth, and slower population growth – will help to restore normal productivity trends.

However, even prior to the COVID pandemic, there were longer-term indicators that Australia's once-strong productivity trajectory had lost much of its momentum. This report has identified some of the most likely causes of that longer-run slowdown. These include:

- Chronic underinvestment by Australian businesses in capital, machinery, and innovation – despite the record profits they have captured in recent years.
- A corresponding and unusual downturn in the general capital intensity of production in Australia, as evidenced by a declining capital-labour ratio.
- Complementary weakness in public investment in infrastructure, public facilities, and publicly-owned businesses.
- A regressing sectoral composition, whereby Australia has become more dependent than ever on extraction and export of non-renewable resources (which tend to demonstrate falling productivity over time), while more technology-intensive and value-adding industries have declined.

- Serious problems in Australia's vocational training system, contributing to the persistence of shortages in many skilled occupations (coincident, ironically, with continued unemployment and underemployment).

- Chronic underutilisation and underpayment of labour in the broader economy and in specific industries (at the extreme, in jobs such as platform work, waiting time is not compensated at all).

In a mostly private-sector economy, fundamental responsibility for productivity lies with the private businesses who are charged with initiating and organising most production. Repetitive business complaints about government taxes or "red tape" and union efforts to make workplaces safer and fairer, are a diversion from their own responsibility for Australia's productivity slowdown. Productivity policy should encourage and challenge private businesses to do a better job: investing in capital and innovation, producing and exporting value-added products and services, working in partnership with public sector infrastructure and services (rather than calling for their elimination or privatisation), and valuing and enhancing labour (including through lifelong training opportunities) rather than cheapening it.

Current public discussions about productivity should be kept in perspective. Productivity problems do not explain why real wages fell significantly in Australia until last year; rather, this was caused by the combination of inadequate wage gains and skyrocketing prices. They do not explain the burden of high interest costs for households with mortgages or other debts. They do not explain continued chronic underutilisation of labour in Australia, including unemployment and underemployment that is too high. And merely hoping for stronger productivity growth in the future is not a credible solution to those problems, which must be addressed instead with direct measures to create jobs, boost wages, and protect consumers.

In the real world, productivity is not an automatic result of the entrepreneurial efficiency of private entrepreneurs. And productivity gains do not trickle down to workers through automatic market forces. Successful episodes of strong productivity growth have depended on strong investment (both private and public) in capital and innovation, pro-active industrial strategies to attract and grow desirable high-productivity industries, and strong investments in the skills, capacities, and well-being of workers. And in the real world, the point of doing those things is missed, unless equally powerful measures are taken to ensure the gains of productivity are widely shared. A real-world productivity strategy for Australia is one that challenges as well as encourages businesses to do better – and one that uses the planning and regulatory capacities of government to guide the economy toward a virtuous combination of investment, productivity, and inclusive prosperity.