Why is wage growth so low when the rate of unemployment is 3.5%?

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(Long) Abstract

I investigate two issues relating to recent developments in wage growth in Australia: First, why has wage growth not increased more as the labour market got tighter during 2021-22? Second, why is the level of nominal wage growth lower today than in the past?

A variety of factors explain how wage growth has responded to current tight labour market conditions. Institutional factors - delays in wage adjustment for workers covered by awards and EBAs, and public sector wage caps – appear to be slowing wages growth. Employers may also be responding to uncertainty about labour market conditions, and influenced by the past decade of slow wage growth, in their decisions about wage-setting. Nevertheless, broader measures of wage growth do display greater cyclical sensitivity than the basic WPI (excluding bonuses) measure. As well, the degree of cyclical sensitivity of wages growth to labour underutilisation in the COVID-19 era is consistent with much of the period since the late 1990s. Hence, longer-run factors need to be considered in seeking to explain what is being observed today.

Most of the slow-down in annual growth in nominal wages from around 2012 is known to be attributable to lower price inflation and lower productivity growth. What I add to this is an explanation for the faster slowdown in annual growth in real earnings than in labour productivity during this period. That explanation is the variables having different deflators; and that a larger decrease occurred in the rate of growth in GDP deflator than in CPI. A corollary is that growth in earnings adjusted by the GDP deflator actually slowed less than labour productivity, implying that structural explanations for the slowdown in nominal wages growth are not required.

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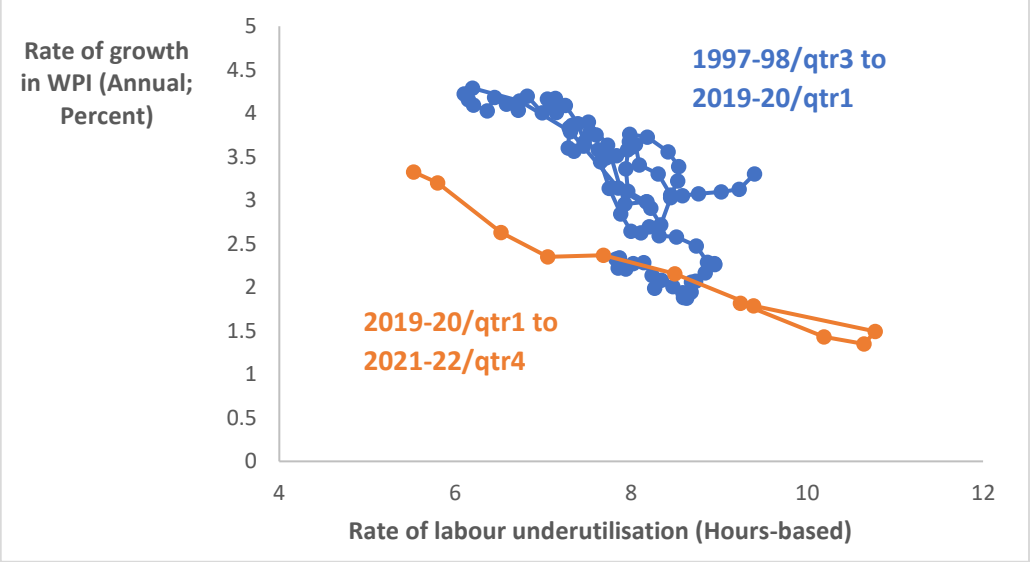
1. Introduction

Questions have been asked about low nominal wage growth in Australia for some time now (Jacobs and Rush, 2015; Australian Treasury, 2017; Bishop and Cassidy, 2017; Chua and Robinson, 2018; Bell and Keating, 2019; Gilfillan, 2019; Cassidy, 2019). The latest version of the question is captured in the title for this paper: Why is wage growth so low when the rate of unemployment is 3.5%? This question, I believe, is in fact two questions in one.

The first question - of more recent origin - is about cyclical sensitivity: why has wage growth not increased more as the labour market has got tighter during 2021-22? The second question – asked for some years now - is about the level of wage growth: why is nominal wage growth lower today than in the past, even once cyclical conditions are accounted for?

Why we would want to ask each of these questions is demonstrated in Chart 1. It shows a Phillips curve relation between the annual rate of growth in WPI and the rate of labour underutilisation (hours-based), for time periods prior to and after the onset of COVID-19.

Chart 1: Annual rate of growth in WPI (total hours; excluding bonuses) and rate of labour underutilisation (hours-based; 4-qtr average), 1997-98/qtr3 to 2021-22/qtr4 (sa)



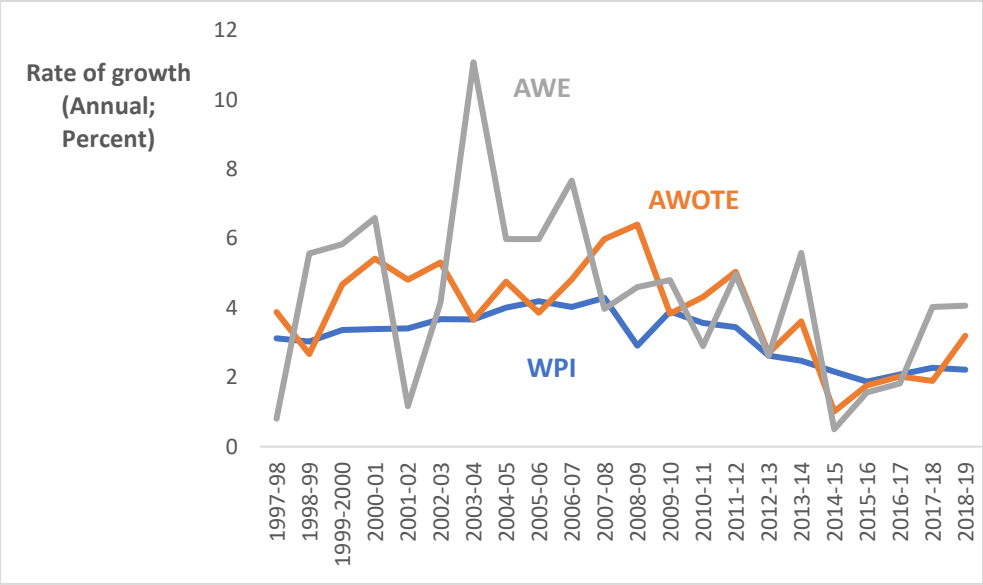
Source: WPI – ABS, Wage Price Index, Table 1; Rate of labour underutilisation (Hours-based): ABS, Labour Accounts Australia, Table 1 (calculated as four-quarter average of ratio of 'Hours sought but not worked' to 'Available hours of labour supply').

Motivating the first question, wage growth appears to have been less sensitive to labour market tightness in the COVID-19 era than previously. A linear regression establishes that a 1 ppt decrease in the rate of labour underutilisation was associated with a 0.73 ppt increase in annual WPI growth in the pre-COVID-19 period; whereas following the

onset of COVID-19 the same decrease in underutilisation has been associated with only a 0.35 ppt increase in annual WPI growth (both significant at the 1% level). [Estimates of the association between wage growth and labour underutilisation from a linear regression model are simply for descriptive purposes, intended to highlight key features of the data – and not an argument that the Phillips curve is linear; on this issue see Bishop and Greenland (2021) and Debelle and Vickery (1997).]

Motivating the second question, nominal wage growth has clearly been lower in the COVID-19 era than previously (no matter what the rate of labour underutilisation). Of course, this situation already existed prior to COVID-19. Chart 2 shows that a breakpoint in the level of nominal wage growth, measured using WPI, Average Weekly Ordinary Time Earnings (AWOTE) or Average Weekly Earnings (AWE), happened in the early 2010s. From 1998 to 2012, the average annual rate of growth in WPI was 3.6 percent, compared to 2.4 percent from 2012 to 2019. The same comparison for AWOTE is 4.4 percent to 2.6 per cent; and for AWE is 5.4 per cent to 2.9 percent.

Chart 2: Annual growth in WPI (total hours; excluding bonuses), AWOTE (Full-time males) and AWE (Full-time males), 1997-98 to 2018-19



Source: WPI: ABS, Wage Price Index, Table 1, December quarter; AWOTE (Full-time males): ABS, Average Weekly Earnings, Table 2, November; AWE: ABS, Employee Earnings, Table 1, August.

2. The cyclical sensitivity of wage growth

Most commentary on the muted response of wage growth to strong labour market conditions in 2021-22 has treated this as a recent phenomenon, and therefore looked for the explanation in factors associated with current or tight labour market conditions. With that commentary in mind, I'll begin by reviewing those factors. But there is an alternative perspective that I'll then go on to consider: that what we are observing at present is a longer-term phenomenon.

a. Current explanations

Several explanations for what is perceived as a relative lack of responsiveness of wage growth to tight labour market conditions - associated with current factors - have been proposed:

• Methods of pay setting are slowing the adjustment of wage growth to increased labour market tightness (Kennedy, 2022);
• Public sector wage caps are artificially slowing wage growth in that part of the labour market;
• The standard measure of WPI used to describe wage growth (total hours; excluding bonuses) may not be accurately reflecting increases in wage growth; and
• Employers are thinking differently about wage setting today than in previous periods of labour market tightness.

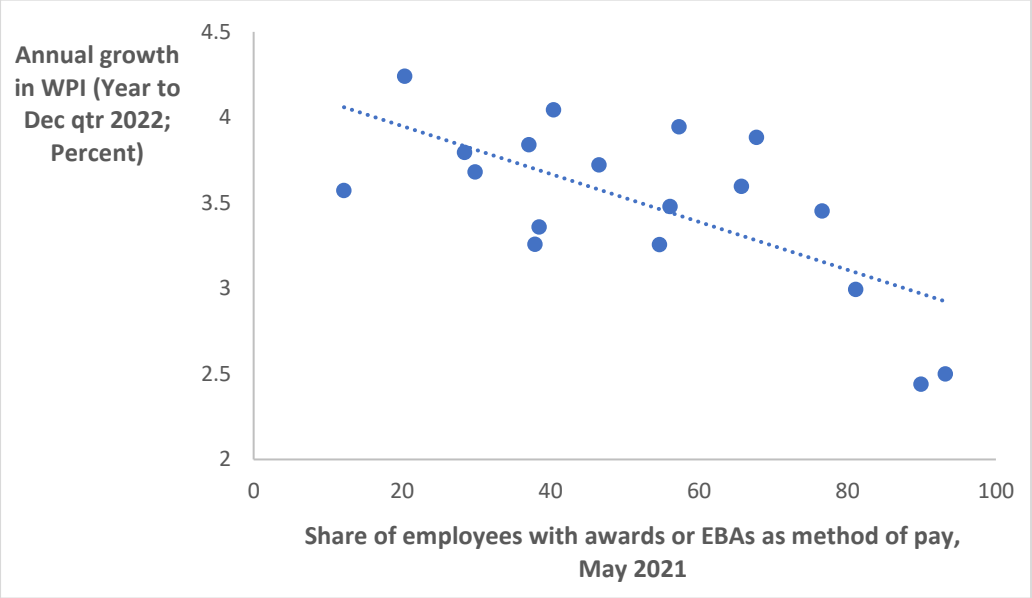
Are methods of pay setting slowing adjustment of wage growth?

Institutions adapt to economic conditions. In the high-inflation era of the 1970s there was a time when the Arbitration and Conciliation Commission was making national wage adjustments every quarter to compensate for CPI movements (see, for example, Sheehan, 1981). But with a long history of low inflation, by the 2020s, the Fair Work Commission was adjusting awards once a year, and EBAs locked in rates of wage growth for several years ahead.

Perhaps it is these built-in delays to wage growth via awards and EBAs that explain the apparent unresponsiveness to labour market tightening. If it is, then we should expect wage growth for workers on awards and EBAs to have been less responsive to labour market conditions than for workers on individual agreements, assuming those agreements can be adjusted more rapidly.

Chart 3 provides industry-level evidence in support of an association between WPI growth and the method of pay setting. It graphs the relation between the industry-level rate of growth in WPI in the year to December 2022 and the proportion of employees in an industry whose pay was set either by awards or EBAs (using most recent ABS data on method of pay from May 2021). A strong relation between the series is evident. On average, a 10 ppt increase in the share of employees covered by awards/EBAs is associated with 0.14 ppt lower annual wage growth in the year to December 2022 (p-value = 0.002).

Chart 3: Annual rate of growth in WPI in year to 2022/qtr4 (total hours; excluding bonuses) and share of employees with wages set by awards or EBAs (2021), Australia



Source: Industry-level WPI growth – ABS, Wage Price Index, Table 5b; Method of pay by industry – ABS, Employee Earnings and Hours, TableBuilder.

Interestingly, and consistent with the idea that awards/EBAs may in recent times have been acting a brake on wage adjustment, the association between WPI growth and method of pay setting strengthened and became statistically significant during 2022. Table 1 reports the association (from an OLS regression) between industry-level annual growth in WPI and the proportion of employees covered by awards/EBAs, for years ending from the March 2021 quarter to December 2022 quarter. The size of relation between industry-level annual wage growth and share of employees covered by awards/EBAs has doubled and become statistically significant from the second quarter of 2022 onwards.

These findings are consistent with Bishop and Cassidy (2019, Graph 10), who report that WPI growth between 2002 and 2018 displayed less cyclical sensitivity for private sector workers on awards and EBAs than for workers on individual agreements. What the analysis here is suggesting is that, in addition, the difference in cyclical sensitivity may become greater during periods of tighter labour market conditions.

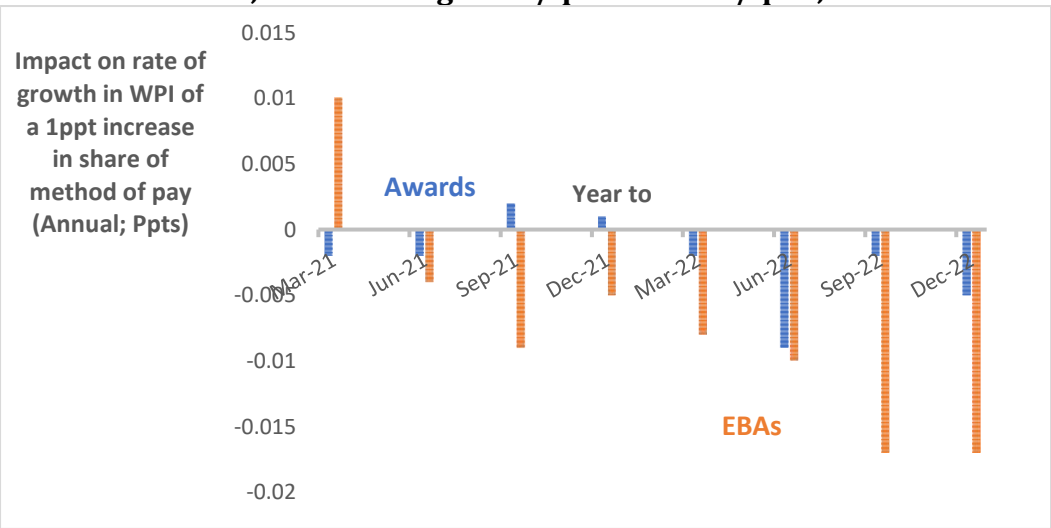
Table 1: Association between industry-level annual WPI growth (total hours; excluding bonuses) and proportion of employees covered by awards/EBAs (May 2021), Years ending 2021/qtr1 to 2022/qtr4 (p-values in parentheses)

Year ending	Impact of 10 ppt increase in share of employees covered by awards/EBAs
2021/1	+0.07 (0.106)
2021/2	-0.04 (0.439)
2021/3	-0.07 (0.214)
2021/4	-0.00 (0.947)
2022/1	-0.06 (0.136)
2022/2	-0.10 (0.003)
2022/3	-0.14 (0.018)
2022/4	-0.14 (0.002)

Source: Industry-level WPI growth – ABS, Wage Price Index, Table 5b; Method of pay by industry – ABS, Employee Earnings and Hours, TableBuilder.

A further extension is to consider separately the association between growth in industry-level WPI and the shares of employees covered by awards and by EBAs. Chart 4 reports the findings from this exercise; that is, repeating the OLS analysis done for Table 1, but with separate variables for the shares of employees covered by awards and EBAs. The notable finding is that the overall pattern in Table 1 is almost entirely accounted for by an increasingly negative association between the industry-level share of employees covered by EBAs and WPI growth. By contrast, any association between WPI growth and the share of employees covered by awards is much smaller and not statistically significant.

Chart 4: Annual rate of growth in WPI and share of employees with wages set by awards and EBAs, Years ending 2021/qtr1 to 2022/qtr4, Australia



Source: Industry-level WPI growth – ABS, Wage Price Index, Table 5b; Method of pay by industry – ABS, Employee Earnings and Hours, TableBuilder.

Why wage growth for EBAs hasn't responded as much to labour market tightness as for individual agreements or awards then becomes an important question. One interpretation is that this is because employees covered by EBAs have the longest built-in adjustment period (being multi-year, versus, for example, awards being adjusted every year). On this interpretation, over the medium-term, as current EBAs expire, and conditional on there still being tight labour market conditions, we should expect that adjustment to begin to occur. However, it is also important to recognise that a majority of employees covered by EBAs are at present working under expired agreements (Productivity Commission, 2023, Figure 4.4). Table 2 shows this has been an increasing trend over the 2010s, with the proportion of employees covered by EBAs working under an expired agreement rising from 35.1 per cent in 2010 to 56.2 per cent in 2021.

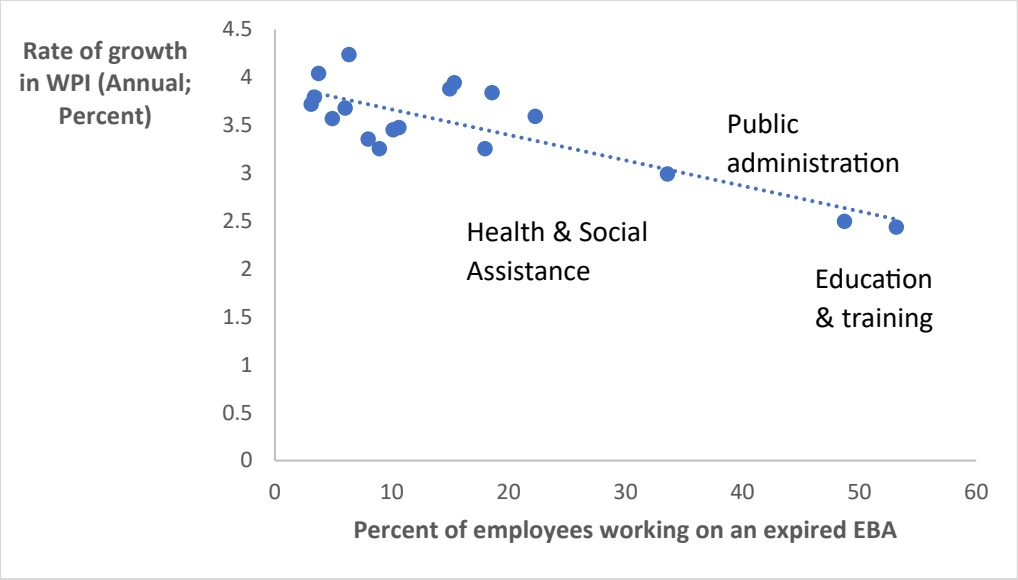
Table 2: Percent of employees with EBA as method of pay setting who are working under an expired agreement, 2021

Year	Percent of employees with EBA as pay setting method working with an expired agreement
2010	35.1
2012	36.0
2014	38.3
2016	44.7
2018	51.8
2021	56.2

Source: (i) Employees with EBA as pay-setting method – ABS, Employee Earnings and Hours; (ii) Employees covered by a current EBA – Department of Employment and Workplace Relations, Trends in Federal Enterprise Agreements; accessed at: https://www.dewr.gov.au/enterprise-agreements-data/trends-federal-enterprise-bargaining

Should this trend continue, it is possible to imagine a more muted upward adjustment in wages for employees covered by EBAs. Chart 5 shows the relation between growth in industry-level WPI in the year to December 2022 and the proportion of employees in an industry working under expired EBAs. A quite strong negative association is apparent: a 10 ppt increase in the fraction of employees working under an expired EBA is associated with annual WPI growth being lower by 0.14 ppt (p-value = 0.016).

Chart 5: Annual WPI Growth (Year to December 2022) and Proportion of Employees Working Under Expired EBAs, By Industry



Source: (i) WPI growth – ABS, Wage Price Index, Table 5b; (ii) Percent of employees working with an expired EBA: (a) Number of employees on EBAs by industry: ABS, Employee Earnings and Hours, Tablebuilder; (b) Number of employees on current EBAs: Department of Employment and Workplace Relations, Trends in Federal Enterprise Agreements; accessed at: https://www.dewr.gov.au/enterprise-agreements-data/trends-federal-enterprise-bargaining

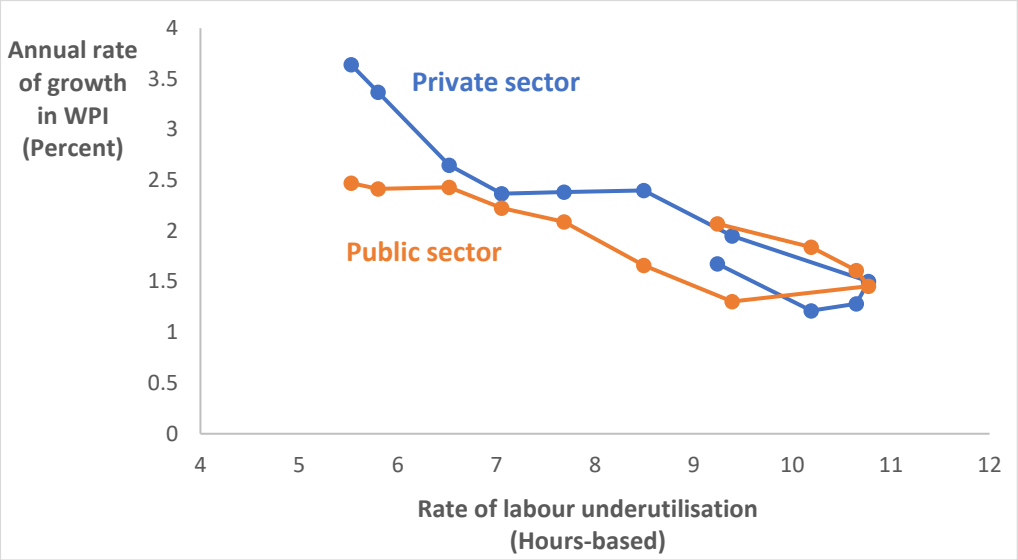
Are public sector wage caps artificially slowing wage growth?

Public sector wage caps may be slowing overall wage growth. Since a large proportion of public sector workers are covered by EBAs, much of any effect of these caps is likely to have been picked up in the preceding analysis of impact of method of pay. But it still seems of interest to study this effect separately, to the extent possible. Chart 6 shows Phillips curve relations between WPI growth, presented separately for public and private sectors, and the overall rate of labour underutilisation (hours-based), for the COVID-19 period.

Up until recently, not much difference is apparent in the sensitivity of public and private sector wages to labour market tightness. But that changed in the second half of 2022. Annual wage growth for private sector workers has increased from 2.6 to 3.6 per cent; but for public sector workers has remained constant at about 2.4 per cent.

Comparing private sector WPI growth to overall WPI growth suggests that, if public sector pay caps are the only reason for the difference in wage growth between public and private sector workers, the caps may currently holding down wage growth by about 0.2 to 0.25 ppts.

Chart 6: Annual rate of growth in WPI and rate of labour underutilisation (hours-based; 4-qtr average), By sector, 2019-20/qtr2 to 2021-22/qtr4, Australia



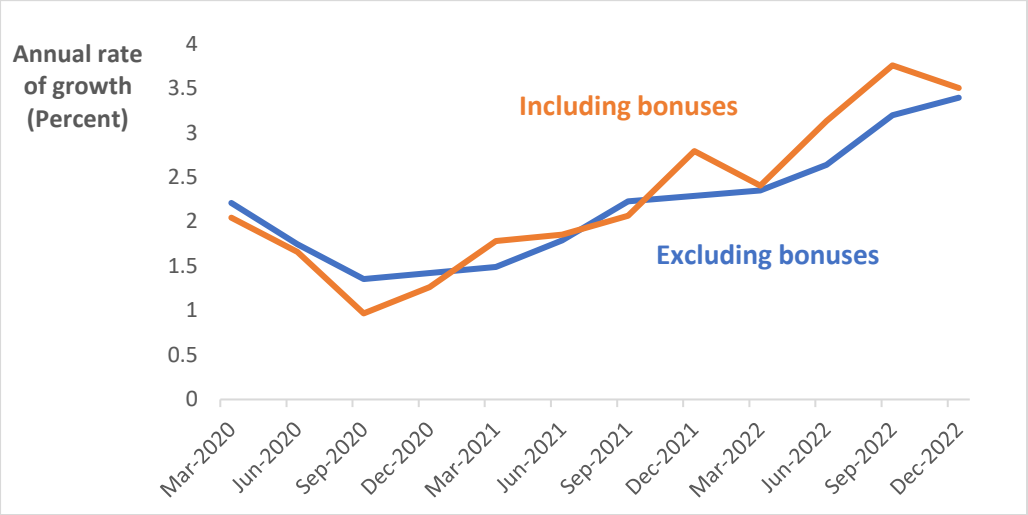
Source: WPI – ABS, Wage Price Index, Table 3b; Rate of labour underutilisation – ABS, Labour Accounts Australia, Table 1.

Is WPI (total hours; excluding bonuses) underestimating wage growth?

Broader measures of wage growth may more accurately reflect what is happening to workers' earnings due to the tighter labour market, than the standard WPI measure. This could be the case, for example, if extra earnings are being paid as bonuses or if the pace of job upgrading has increased.

As an illustration, I consider using a broader measure of WPI that includes bonuses. Chart 7 shows rates of growth for WPI series including and excluding bonuses, since the start of the pandemic. From mid-2021 onwards, coinciding with the tightening labour market, growth in WPI including bonuses has been consistently higher than for WPI excluding bonuses, by an average of about 0.25ppt. Moreover, taking account of bonuses strengthens the association between WPI growth and labour market tightness: Now in the COVID-19-era a 1ppt decrease in the rate of labour market underutilisation is associated with a 0.45 ppt increase in WPI growth (compared to 0.35 ppt for WPI excluding bonuses) (both effects significant at the 1% level).

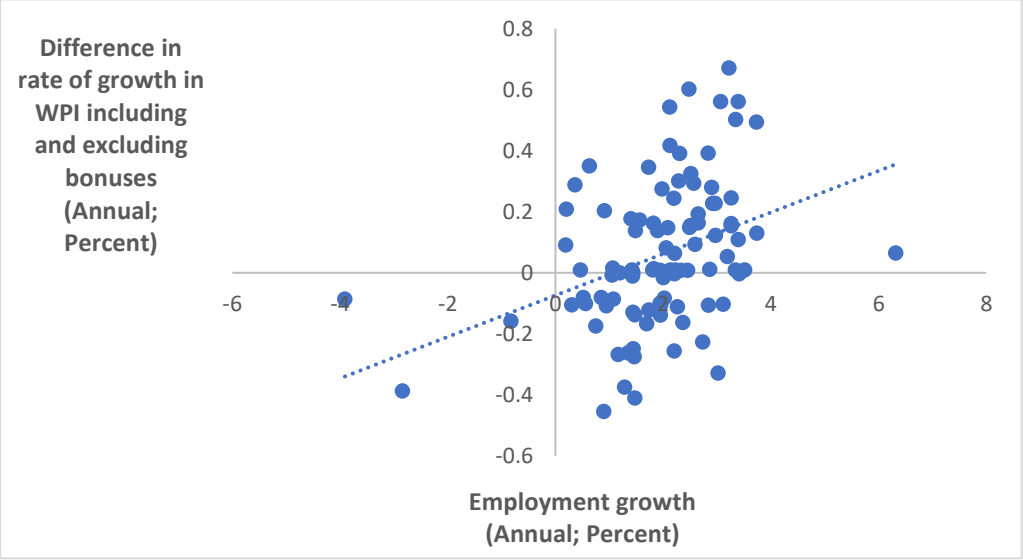
Chart 7: Annual rate of growth in WPI, Excluding and including bonuses, 2019-20/qtr1 to 2021-22/qtr4



Source: ABS, Wage Price Index, Tables 1 and 7b.

It turns out this is not unusual, that periods of stronger employment growth tend to be associated with a larger gap between WPI growth including and excluding bonuses. Chart 8 shows this relation. On average, a 1 ppt increase in the rate of employment growth is associated with the gap between growth in WPI including and excluding bonuses increasing by 0.07 ppt (significant at the 1% level).

Chart 8: Annual rate of employment growth and difference in annual rates of growth in WPI including and excluding bonuses, 1997-98/qtr3 to 2021-22/qtr4



Source: WPI difference - ABS, Wage Price Index, Tables 1 and 7b; Rate of employment growth – ABS, Labour Force Australia, Table 1.

Employers' expectations

Employers in recent times have faced a choice between: (i) Paying higher wages now in order to immediately get the extra labour they need, at the cost of locking in higher wages for the future; or (ii) Waiting to see if return to the pre-COVID labour market (for example, involving increased inflows of international students and working holiday makers) allows them to solve the labour shortage problem without needing to pay higher wages, with the cost that they have to run their businesses today with less workers than they would like. Given the uncertainty that has existed about the state of the labour market, it's doesn't seem unreasonable to think that many employers may have preferred the second option. Choosing that option may also seem the most natural path to take, given the past decade where employers have got used to not having to pay big wage increases to attract workers.

b. Longer-term explanations

Looking more closely at the relation between WPI growth and the rate of labour underutilisation suggests an alternative explanation for the cyclical sensitivity of wage growth to current tight labour market conditions: That what we are observing at present is just a continuation of what occurred in the 2000s. Chart 9 shows the estimated relation between the rate of growth in WPI and the rate of labour underutilisation (hours-based) for a rolling set of 6-year periods ending from 2004 to 2022.

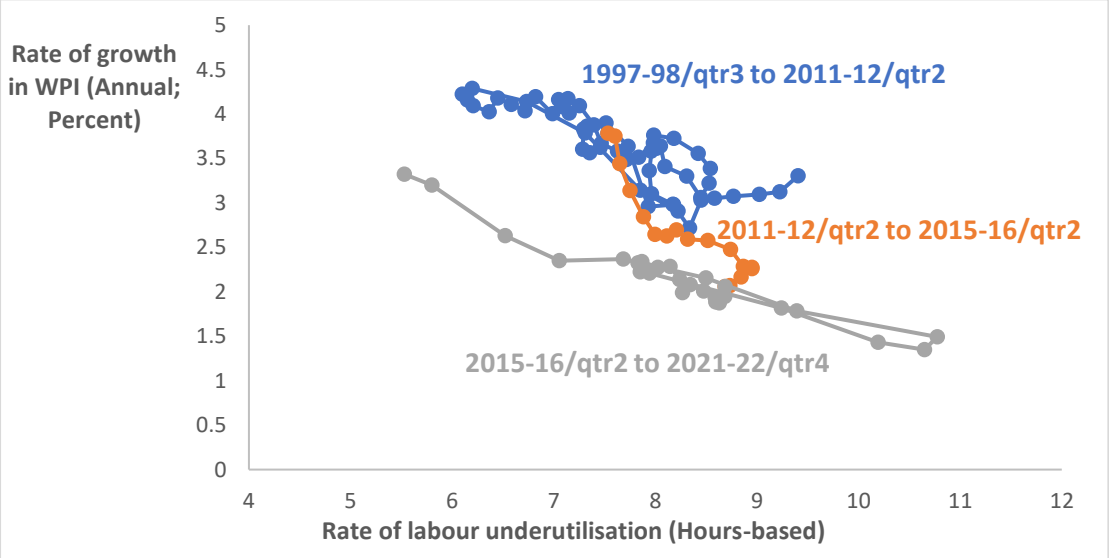
Chart 9: Relation between rate of growth in WPI and rate of labour underutilisation (hours-based), 1997-98/qtr 3 to 2021-2022/qtr4

Source: WPI – ABS, Wage Price Index, Table 1; Rate of labour underutilisation (Hours-based): ABS, Labour Accounts Australia, Table 1 (calculated as four-quarter average of ratio of 'Hours sought but not worked' to 'Available hours of labour supply')

The important point to note is that relatively weak cyclical sensitivity is not a new phenomenon, also characterising the period from the late 1990s to the early 2010s. It is only for 6-year intervals that encompass the early to mid-2010s that a high level of cyclical sensitivity is evident. (It is this sub-period which drives the difference in average sensitivity between the periods prior to and after the onset of COVID-19, reported on in the discussion of Chart 1.)

Re-presenting the Phillips curve from Chart 1, with time periods broken up into different sub-periods, as done in Chart 10, makes this point. The association between the rate of growth in WPI and rate of labour underutilisation now looks similar in periods up to 2011-12 and after 2015-16, but with a much stronger association in the intervening years. A linear regression establishes that a 1 ppt decrease in the rate of labour underutilisation was associated with a 0.45 ppt increase in annual WPI growth in the sub-period up to 2011-12 and 0.35 ppt in the sub-period from 2015-16 on onwards; compared with 0.97 ppt between 2011-12 and 2015-16 (with all associations significant at the 1% level).

Chart 10: Annual rate of growth in WPI (total hours; excluding bonuses) and rate of labour underutilisation (hours-based; 4-qtr average), 1997-98/qtr3 to 2021-22/qtr4 (sa)

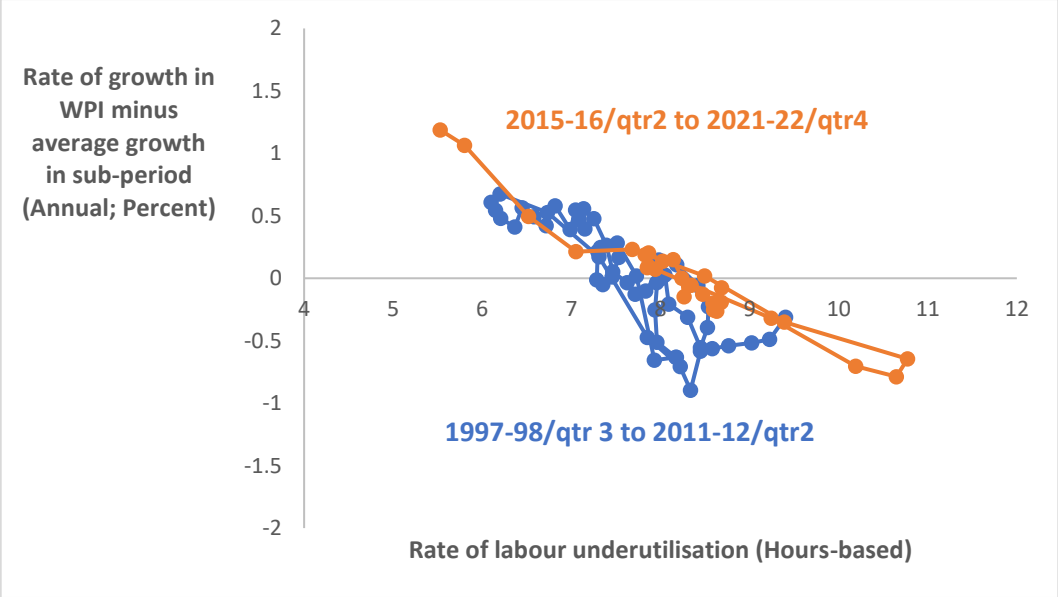


Source: WPI – ABS, Wage Price Index, Table 1; Rate of labour underutilisation (Hours-based): ABS, Labour Accounts Australia, Table 1 (calculated as four-quarter average of ratio of 'Hours sought but not worked' to 'Available hours of labour supply')

What we observe during the early to mid-2010s may represent genuine temporary variation in the cyclical sensitivity of wage growth. But it may also reflect other forces that give the impression of changing cyclical sensitivity. In particular, it's interesting that the aberrant period coincides with the time when the level of nominal wage growth was adjusting downwards. Hence, what we may in fact be observing during that time is a shift from a higher to lower Phillips curve, both with the same cyclical sensitivity.

Chart 11 makes a direct comparison between the earlier and later sub-periods. It graphs a Phillips curve relation with an adjusted wage growth variable: equal to the actual annual rate of growth minus the average rate of growth for respective sub-period. Overall, cyclical variability in the two sub-periods looks quite similar. If anything, there has perhaps been a stronger association between wage growth and labour underutilisation in conditions of labour market tightness (with a rate of labour underutilisation above 7 percent) in recent times than in the 2000s.

Chart 11: Annual rate of growth in WPI minus average rate of growth (total hours; excluding bonuses) and rate of labour underutilisation (hours-based; 4-qtr average), Sub-periods



Source: WPI – ABS, Wage Price Index, Table 1; Rate of labour underutilisation (Hours-based): ABS, Labour Accounts Australia, Table 1 (calculated as four-quarter average of ratio of 'Hours sought but not worked' to 'Available hours of labour supply')

Similarities between the COVID-19 era and previous episodes of labour market tightness suggests a role for longer-term factors in explaining cyclical sensitivity of wage growth. Anchoring of inflation expectations due to inflation targeting and growth in competition from international markets have been identified as factors affecting the 'shape' of the Phillips curve since the mid-1990s (for example, Kuttner and Robinson, 2008). Of course, some of what I described in the previous sub-section as current factors may also be longer-term factors. Primarily, changes to wage bargaining arrangements (through changes to timing of wage adjustment and a shift away from pattern bargaining) may have built in greater inertia in wage setting from time of introduction of enterprise bargaining in early 1990s.

3. The level of wage growth

Concerns about the level of nominal wages growth have been expressed using a variety of types of evidence in recent years: a long-run divergence between real (consumer) wages and labour productivity going back to mid-1980s (Isaac, 2018); the decline in labour's share of income from the mid-1990s (Cowgill, 2013; La Cava, 2019; Borland and Coelli, 2023); and an apparent slowing of nominal wage growth after 2011-12 and emergence of an 'unexplained' component in the Phillips curve relation at the same time (Bishop and Cassidy, 2017; Cassidy, 2019).

Here, I'll focus on the latter phenomenon of slowing nominal wage growth in the 2010s. I'll mainly consider the period up to 2019, due to the disruption of COVID-19; and will mainly use an earnings measure based on weekly earnings for full-time male employees, in order to capture productivity effects on earnings and to seek to control for the impact of changes in hours of work on earnings.

Between 1998-2012 and 2012-19, annual growth in weekly earnings for full-time males slowed: in AWOTE from 4.4% to 2.6%; and in AWE from 5.4% to 2.9%. Table 3 shows that the slow-down in nominal wage growth between those periods can be mainly attributed to a lower rate of price inflation and slower productivity growth. About four-fifths of the slowdown in AWOTE (1.6% out of 2.0%) and two-thirds of the slow-down in AWE (1.6% out of 2.5%) can be accounted for by those factors. (Note that extending the comparison time period back to earlier than 1998 does not appreciably alter the proportion of the slow-down in nominal wage growth can be explained by lower price inflation and productivity growth.)

Slightly weaker business cycle conditions in 2012-19 than 1998-2012 may also explain some of the slowdown, although this seems a lesser influence. The rate of labour underutilisation (hours-based) averaged 7.7 per cent in 1998-2012 and 8.3 per cent from 2012-19. Based on a 1ppt increase in the rate of labour underutilisation (hour-based) being associated with slower nominal wage growth of 0.4ppt per annum, this suggests about 0.25ppt might be explained in this way.

That the slow-down in nominal wage growth is primarily explained by lower price inflation and productivity growth seems generally accepted (see for example, Chua and Robinson, 2018; Cassidy, 2019; Andrews et al., 2019) – and is consistent with conclusion of IMF (2017, p.73) on main sources of slow nominal wage growth across developed economies:
'Nominal wage dynamics, in general, are related to underlying changes in a "real" component—physical output created by labor together with other inputs into production—as well as inflation pressure in the economy. Viewed through this lens, subdued nominal wage growth is, in principle, consistent with a widely recognized

slowdown in labor productivity, which can weigh on underlying real wage dynamics, and generally low inflation across advanced economies.'

Table 3: Wages, prices and labour productivity, Annual rates of growth, 1998-2012 and 2012-2019

	1998 to 2012	2012 to 2019	Difference
AWOTE (Full-time males)	4.6	2.6	-2.0
AWE (Full-time males)	5.4	2.9	-2.5
CPI	2.9	1.9	-1.0
GDP per hour worked	1.5	0.9	-0.6
Labour productivity – Market sectors	1.8	1.4	-0.4

Sources: AWOTE – ABS, Average Weekly Earnings Australia, Table 1, May; AWE – ABS, Employee Earnings, Table 1; CPI – ABS, Consumer Price Index, Table 1; Labour productivity – GDP per hour worked: ABS, Australian System of National Accounts, Table 1; Labour productivity – Market sectors: ABS, Estimates of Industry Multifactor Productivity, Table 4.

Significant interest has also attached to the 'residual' component of slower nominal wage growth not explained by lower price inflation and productivity growth – and the question of whether there might be additional structural influences underlying that component. To shed further light on this question, I undertake a decomposition analysis of sources of change in difference between the annual rate of growth in real AWOTE and labour productivity between 1998-2012 and 2012-19. The decomposition follows the same approach as Teichgraber and Van Reenen (2019), which allows sources of slow-down in growth of real AWOTE relative to labour productivity to be divided between:

• Effect due to AWOTE being deflated by CPI and labour productivity by the GDP deflator (Deflator effect);
• Effect due to slippage between measurement of AWOTE and wages and salaries in the National Accounts (National Accounts/Earnings survey divergence);
• Effect due to different growth rates between wages and salary payments to employees and total compensation to employees (Non-wage compensation effect); and
• Effect due to different growth rates between total compensation to employees and labour productivity (Net decoupling).

Results from the decomposition are presented in Table 4. Overall, the rate of annual growth in real (CPI-adjusted) AWOTE falls by 0.4ppts compared to annual growth in labour productivity between 1998-2012 and 2012-19. The decomposition shows that this was primarily due to a larger decrease between those time periods in the rate of growth of the GDP deflator (about 1.9ppts) compared to the rate of growth in CPI (about 1ppt). Offsetting that effect were a smaller decrease in growth in wage and salary

payments than in labour productivity, and a smaller decrease in the rate of growth in AWOTE than in wage and salary payments. [The latter effect represents a measurement gap between AWOTE and wage and salary payments per employee. Removing that gap would imply a fall in average earnings adjusted by CPI of 0.9ppts per annum compared to labour productivity, with that gap being explained by the deflator effect, partially offset by faster growth in earnings adjusted by the GDP deflator relative to labour productivity.]

Further decomposition analysis is presented in Appendix Table 1 for the sources of differences between changes in annual rates of growth in real (CPI-adjusted) median weekly earnings and labour productivity. The overall rate of annual growth in real (CPI-adjusted) median weekly earnings increased by 0.2ppts compared to annual growth in labour productivity between 1998-2012 and 2012-19. The decomposition shows that this overall difference reflected two large offsetting effects: the deflator effect (-1.2ppts); and a much slower increase in inequality, measured by the gap between growth in average weekly earnings and median weekly earnings (+1.0ppt).

The decompositions establish that: (1) Annual growth in real (GDP deflator adjusted) earnings did not slow as much as growth in labour productivity between 1998-2012 and 2012-19; (2) But annual growth in real (CPI-adjusted) earnings did slow compared to growth in labour productivity due to a larger decrease in the rate of growth of the GDP deflator compared to the rate of growth in CPI.

Altogether, the results pose a challenge to the need for structural interpretations of the slow-down in nominal wage growth associated with an increased gap between annual growth in real (CPI-adjusted) earnings and labour productivity from early 2010s (see for example, Weir, 2018). Of course, this is just one aspect of the wages puzzle – about explaining a change in nominal wage growth. Structural explanations – such as the impact of decreased worker bargaining power, changes to product or labour market structure or direct impacts of technology - are still likely to be highly relevant to explaining other aspects of the wages puzzle, such as labour's decreasing share of national income (for analysis of the influence of changes to labour market institutions, see Isaac, 2018 and Bishop and Chan, 2019; and for analysis of impacts of market structure on wage-setting, see Deutscher, 2019 and Hambur, 2023).

Table 4: Decomposition of sources of change in difference between labour productivity growth and growth in AWOTE, 1998-2012 versus 2012-19

		Difference in annual growth rate (ppts)
$\Delta AWOTE/CPI - \Delta LPI$	Overall decoupling: Difference between changes in growth in real AWOTE (CPI) and LPI growth	-0.4
Impact due to:		
$\Delta AWOTE/CPI -$ $\Delta AWOTE/GDP\ deflator$ –	Deflator effect: Difference between changes in growth in real AWOTE (CPI) and real AWOTE (GDP)	-1.2
$\Delta Real\ AWOTE/GDP\ deflator$ - $\Delta Wages\ and\ Salary\ per\ employee/GDP\ deflator$	National Accounts/Earnings survey divergence: Difference between changes in growth in real AWOTE (GDP) and real wage and salary payments per employee (GDP)	+0.5
$\Delta Wages\&Salary\ per\ employee/GDP\ deflator$ - $\Delta Compensation\ per\ employee/GDP\ deflator$	Non-wage compensation: Difference between changes in growth in real wage and salary payments per employee (GDP) and growth in real compensation per employee (GDP)	+0.4
$\Delta Compensation\ per\ employee/GDP\ deflator -$ ΔLPI	Net decoupling: Difference between changes in growth in real compensation per employee (GDP) and growth in LPI	-0.1

Note: Measures of compensation per employee and wages and salaries per employee are adjusted for changes over time in average hours worked, in order to be equivalent to data on AWOTE and AWE for full-time employees.
Sources: (i) LPI – ABS, Australian System of National Accounts, Table 1; (ii) AWOTE for male full-time employees – ABS, Average Weekly Earnings, Table 2, May; (iii) Compensation/Wage and Salary payments – ABS, Australian System of National Accounts, Table 48; (iv) Average/Median Weekly Earnings for male full-time employees – ABS, Employee Earnings, Table 1; (v) Number of employees – ABS, Labour Force Australia - Detailed, Table 08; (vi) Hours worked – Australian System of National Accounts, Table 1; (vii) GDP deflator – Australian System of National Accounts, Table 4; (viii) CPI – ABS, Consumer Price Index, Table 1.

References

Andrews, Dan, Nathan Deutscher, Jonathan Hambur and David Hansell (2019), 'Wage growth in Australia: Lessons from longitudinal data', Treasury Working Paper no. 2019-04.

Australian Treasury (2017), 'Analysis of wage growth'; accessed at: https://treasury.gov.au/sites/default/files/2019-03/p2017-t237966.pdf

Bell, Stephen and Michael Keating (2019), 'Low wage growth: Why it matters and how to fix it', *Australian Economic Review*, 52(4): 377-92.

Bishop, James and Natasha Cassidy (2017), 'Insights into low wage growth in Australia', *RBA Bulletin*, March quarter, pp.13-20.

Bishop, James and Natasha Cassidy (2019), 'Wage growth by pay setting method', *RBA Bulletin*, June quarter, pp.67-86.

Bishop, James and Iris Chan (2019), 'Is declining union membership contributing to low wages growth?', Reserve Bank of Australia, Research Discussion Paper no. 2019-02.

Bishop, James and Emma Greenland (2021), 'Is the Phillips curve still a curve? Evidence from the regions', Reserve Bank of Australia, Research Discussion Paper no. 2021-09.

Borland, Jeff and Michael Coelli (2023), 'The Australian labour market and IT-enabled technological change', Melbourne Institute Working Paper, No. 23-01.

Cassidy, Natasha (2019), 'Low wages growth: An introduction', in Reserve Bank of Australia (2019), *Conference-2019: Low Wage Growth*; accessed at: https://www.rba.gov.au/publications/confs/2019/

Chua, Chew Lian and Tim Robinson (2018), 'Why has Australian wages growth been so low? A Phillips curve perspective', *Economic Record*, 94(Special Issue): 11-32.

Cowgill, Matthew (2013), 'A shrinking slice of the pie', ACTU Working Paper no.1. Accessed at: https://www.actu.org.au/media/297315/Shrinking%20Slice%20of%20the%20Pie%202013%20Final.pdf

Debelle, Guy and James Vickery (1997), 'Is the Phillips curve a curve? Some evidence and implications for Australia', Reserve Bank of Australia, Research Discussion Paper no. 9706.

Deutscher, Nathan (2019), 'Job-to-job transitions and the wages of Australian workers', Treasury Working Paper 2019-07.

Gilfillan, Geoff (2019), 'The extent and causes of the wage growth slowdown in Australia', Parliamentary Library Research Paper Series.

Hambur, Jonathan (2023), 'Did labour market concentration lower wages growth pre-COVID?', Treasury Working Paper 2023-01.

International Monetary Fund (2017), *World Economic Outlook: Seeking Sustainable Growth – Short-term Recovery, Long-term Challenges*, Washington DC.

Isaac, Joe (2018), 'Why are Australian wages lagging and what can be done about it?', *Australian Economic Review*, 51(2): 175-90.

Jacobs, David and Alexandra Rush (2015), 'Why is wage growth so low?', *RBA Bulletin*, June quarter, pages 9-18.

Kennedy, Tom (2022), 'Australia: Where's the wage pressure?', J,P. Morgan Research Note.

Kuttner, Ken and Tim Robinson (2008), 'Understanding the flattening Phillips curve', Reserve Bank of Australia, Research Discussion Paper no. 2008-05.

La Cava, Gianni (2019), 'The labour and capital shares of income in Australia', *RBA Bulletin*, March: 1-22.

Productivity Commission (2023), *5-Year Productivity Inquiry: A More Productive Labour Market*, Report no.100, Volume 7, Canberra.

Sheehan, Peter (1981), 'Wages policy in the seventies and beyond', chapter 5 in Keith Hancock (ed.) *Incomes Policy in Australia* (Harcourt Brace Jovanovich).

Teichgraber, Andreas and John Van Reenen (2019), 'Have productivity and pay decoupled in the UK?', Program on Innovation and Diffusion, LSE, Working Paper no.021.

Weir, Geoff (2018), 'Wage growth puzzles and technology', Reserve Bank of Australia, Research Discussion Paper 2018-10.

Appendix Table 1: Decomposition of sources of change in difference between labour productivity growth and growth in median full-time weekly earnings, 1998-2012 versus 2012-19

		Difference in annual growth rate (ppts)
$\Delta Median\ Weekly\ Earnings/$ CPI - ΔLPI	Overall decoupling: Difference between changes in growth in real median weekly earnings (CPI) and growth in LPI	+0.2
Impact due to:		
$\Delta Median\ Weekly\ Earnings/ CPI$ – ΔAWE/CPI	Inequality effect: Difference between changes in growth in real median weekly earnings (CPI) and real average weekly earnings (CPI)	+1.0
$\Delta AWE/ CPI$ – $\Delta AWE/ GDP\ deflator$ –	Deflator effect: Difference in changes between growth in real AWE (CPI) and real AWE(GDP)	-1.0
$\Delta AWE/ GDP\ deflator$ – $\Delta Wages\ and\ Salary\ per\ employee/ GDP\ deflator$	National Accounts/LFS divergence: Difference in changes between growth in real AWE (GDP) and real wage and salary payments per employee (GDP)	+0.1
$\Delta Wages\&Salary\ per\ employee/ GDP\ deflator$ – $\Delta Compensation\ per\ employee/ GDP\ deflator$	Non-wage compensation: Difference between changes in growth in real wage and salary payments per employee (GDP)and real compensation per employee (GDP)	+0.4
$\Delta Compensation\ per\ employee/ GDP\ deflator$ – ΔLPI	Net decoupling: Difference between changes in growth in real compensation per employee (GDP) and LPI growth	-0.1