

# Appendix – How tight is the Australian labour market? And what does it mean for wages and inflation?

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## Full article: How tight is the Australian labour market? And what does it mean for wages and inflation?

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This appendix provides a description of the assumptions and methodology underlying the estimates described in [Saunders \(2022\)](#).

### Indicators of labour market slack

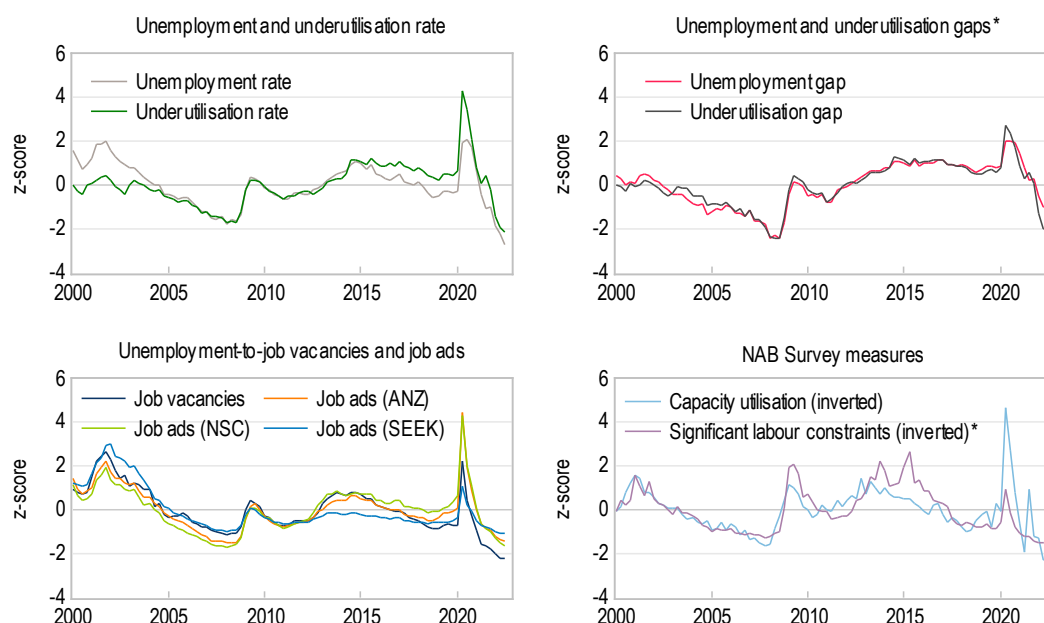
I used a number of different measures of labour market slack to assess the outlook for wages growth and inflation. This includes:

- the unemployment rate and unemployment gap,
- the underutilisation rate and its gap measure,
- the ratios of job vacancies and advertisements to unemployed persons,
- NAB capacity utilisation, and
- NAB's measure of significant labour constraints.

For job advertisements, the data are further split between those provided by Seek, ANZ and the National Skills Commission (NSC). This means I assessed ten different indicators of labour market slack (Graph A1).

**GRAPH A1: MEASURES OF UNEMPLOYMENT SLACK**

(DECLINES IMPLY LESS SLACK / TIGHTER CONDITIONS)



\* As a ratio to the unemployment and underutilisation rates

\*\* Share of firms reporting the availability of labour as a significant constraint on output

Sources: QTC, Refinitiv Datastream, SEEK

## Adjustments to job vacancies and advertisements

I made a number of adjustments to the job vacancies and advertisements data prior to estimating the forecasts.

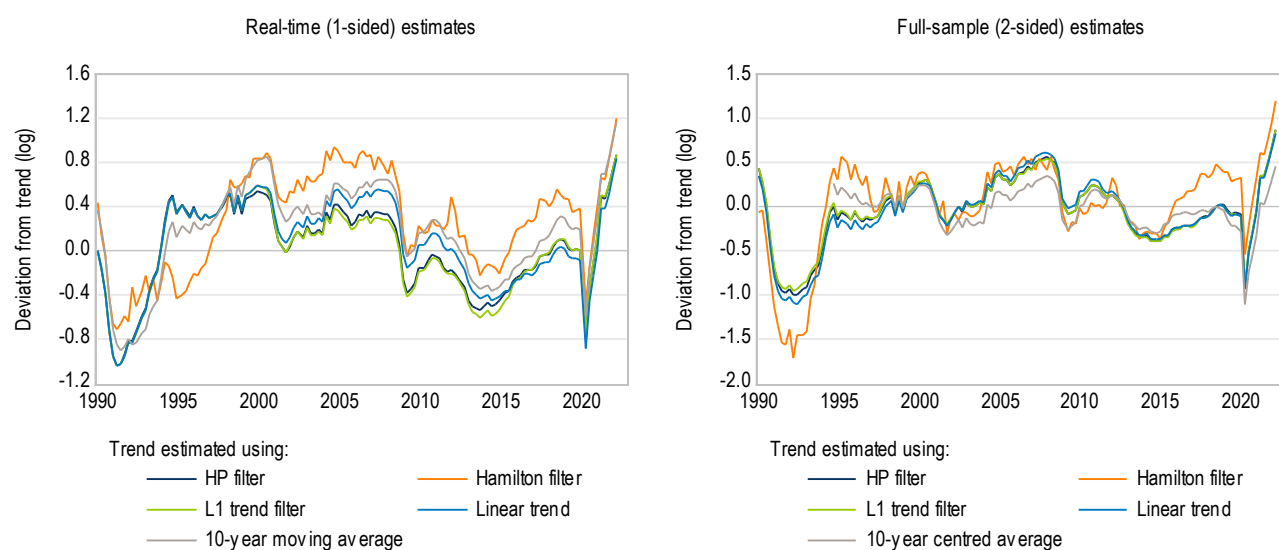
First, the ABS stopped reporting on job vacancies from Q3 2008 to Q3 2009. I have interpolated these missing values using job advertisements data and the Kalman filter.

Second, I have extended the time series for job ads by splicing these data with job vacancies. In particular, SEEK job ads data are available from 2001, while ANZ job ads start in 1999. Given the forecast evaluation starts in 2005, this doesn't provide a large initial estimation sample for the Phillips curve equations. The spliced data allow for a larger initial estimation sample, which results in more stable coefficients and improved forecast accuracy.

And finally, the ratios of job vacancies and job ads to unemployment have been de-trended for the forecasting exercise. I have used a one-sided HP filter with a large smoothing parameter ( $\lambda = 400,000$ ) to de-trend these data, though the results are similar for other de-trending methods (Graph 2).<sup>1</sup>

The value of the smoothing parameter was chosen so that the persistence of the cycle estimates broadly matched the persistence of the unemployment gap (ie, I assumed that the vacancy-to-unemployment ratio and unemployment rate share similar cycles). This approach also resulted in slightly more accurate wages and inflation forecasts.

**GRAPH A2: DE-TRENDED JOB VACANCY-TO-UNEMPLOYMENT RATIOS\***



## Forecast assessment

To assess the outlook for wages growth and trimmed-mean inflation over the coming year, I have included each of these indicators in simple wage and price Phillips curve models.

The forecasts are 'out-of-sample' as they only use information that was available prior to evaluation period. For example, I started off by estimating all the models using the data available up to 2004Q1, and then produced forecasts for each quarter up to 2005Q1. I then expanded the window by one quarter, estimating the models using the available data up to 2004Q2, and compiled forecasts to 2005Q2. And so on. This iterative procedure should provide a relatively accurate assessment of the models' real-time forecast accuracy.

I have evaluated the accuracy of these forecasts for the period from 2005Q1 to 2019Q4. The evaluation period includes the increase in wages and inflation during the pre-GFC mining boom, but excludes the volatility in inflation and wages growth since the onset of the pandemic. Much of this recent volatility in inflation can be explained by supply-side disruptions, which are not accounted for in these models. Moreover, demand is likely to increasingly drive inflation going forward, so the models' forecast accuracy over the past couple of years may not be representative of its performance in the period ahead.

<sup>1</sup> This includes the [Hamilton filter](#), using the  $\ell_1$  trend filtering method proposed by [Kim, Koh and Boyd \(2009\)](#), removing a simple linear trend, and comparing the ratio to a long-run moving average.