

Response to the BIS Shrapnel reports of March 2011

Australian Energy
Regulator

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Dear Adam

Response to the BIS Shrapnel report of March 2011

Attached is our response to the recent report by BIS Shrapnel.

We have addressed the issues you have raised in our correspondence, as well as run through our arguments in favour of the LPI as a better measure than AWOTE.

This report should be read in conjunction with our updated forecast report to the AER of 23 April 2011.

Yours sincerely,

Chris Richardson
Director
Deloitte Access Economics Pty Ltd

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1 Background

The AER requested that Deloitte Access Economics comment on the criticisms of our model in the BIS Shrapnel report *Review of Access Economics' utilities wage model* of March 2011; specifically:

- The use of 'user adjustments' in our modelling; and
- BIS Shrapnel's simulation of the intermediate wage setting model.

We further comment on the suitability of using AWOTE wage measures (as opposed to LPI measures) in the context of the arguments provided in the BIS Shrapnel report *Wages Outlook for the Electricity Distribution Sector in Victoria* of July 2010.

These matters are considered in this report. It should be read in conjunction with our updated forecast report to the AER of 23 April 2011.

2 Model and methodology

The BIS Shrapnel report *Review of Access Economics' utilities wage model* of July 2010¹ argues that the:

“AE wage deviation model is seriously flawed. It fails to incorporate the underlying structural drivers of wage formation in the EGW sector. Moreover, the model’s component determinants do a poor job in explaining the variations in the sector wage deviations. As a result, the prescribed model is far from a reasonable approximation to the underlying data generating process. AE wage deviation model plays an integral part in AE overall sector wage forecasts. Given the limitations of the wage deviation model, we believe AE final EGW wage escalation forecasts are seriously undermined. As a result, the forecasts provided by AE cannot be considered as optimal. In this regard, they should be rejected by the AER.”

2.1 The Deloitte Access Economics approach

As previously noted in our reports for AER (and commented on by BIS Shrapnel in its July 2010 report), Deloitte Access Economics' approach focuses on:

- **Business cycle factors.** That is, forecasts are affected by deviations in industry (or State) performance compared with the national average. Faster growing industries and States will tend to see faster growth in wages and vice versa. In the wages model, the key factor is how fast the industry (or State) is growing relative both to the national average, as well as to historical averages. So, while manufacturing growth in the future may be below the national average, if the gap is relatively less than has been seen in recent years, this is viewed as an out-performance by the sector and would see some upward pressure on wages. The wages model methodology is forward-looking, with forecast growth across the next six months (as well as the past twelve) used to determine the current performance of an industry.
- **Productivity factors.** The model assumes that industries with faster growth in productivity will see faster growth in wages – workers across an industry being rewarded for increasing the average amount of output per employee faster than the national average. As these factors take some time to become evident (and due to the inherent volatility in productivity measures at the State and industry level), an average productivity trend across the past two years is used.
- **Competition (relative wage) factors.** Depending on the nature of the industry, workers will have skills that are relatively more or less transferable to other sectors where wages may be rising faster than on their own. Indeed, many workers will be performing effectively the same task (or the same occupation – effectively their job description) across different industries (as their industry classification is determined by what their employer produces, rather than what they do). This will tend to limit the ability of wage rates to diverge. As wage rates in (say) mining rise higher,

¹ Also included in their March 2011 report as Appendix C

companies in (say) the construction sector will be forced to pay higher wages to keep their staff. Similar factors operate across States – although they are likely to be less significant (and react only to relatively larger discrepancies in wages). Our modelling approach therefore sees wages in competitor industries tending to move more closely together over time – with industries that are benefiting from the two previous factors tending to be drawn back towards the average, and wages in otherwise slow growing industries boosted.

In addition, institutional factors can assist in short term forecasting (as opposed to longer term forecasts), given that most such decisions have lingering effects on wage outcomes.

Accordingly, Deloitte Access Economics monitors developments in DEEWR's *Trends in Federal Enterprise Bargaining* reports², and takes account of these in its short term forecasting if they appear likely to have a material impact.

As BIS Shrapnel's report notes:

...it may be noted that AE does not strictly apply their model generated forecast deviations to the national forecasts in order to arrive at the wage escalation rates for the sector. They apply a 'user adjustment' which is effectively tantamount to a 'fudge factor' to the model predictions before settling on their final future model deviations. These are then applied to the national wage forecasts to arrive at the sector wage escalation rates at the national level over the forecast horizon.

That is quite true. No model can include all possible influences that will drive the LPI in the future, there will always be that could be added. Any model will only provide a framework for analysis, and only takes into account the variables used explicitly within it.

Accordingly, **good forecast practice always requires a careful consideration of the 'raw' model output. To do anything else would make too little use of the 'toolkit' provided by economics.**

A few of the main additional factors that we are capturing in the 'user adjustments' are noted:

- Short term trends based on recent movements in DEEWR's *Trends in Enterprise Bargaining* report.
- Volatility in recent employment or output results may give spurious indicators of expected LPI movements, particularly where a recent development is expected to be unwound in short order. The model itself may suggest a spike and retreat in employment levels should drive a similar pattern in the LPI, but we may feel the markets pressures may largely ignore the employment pattern.
- Changing expectations of industry performance over the longer term. As the modelling notes, the business cycle effect is driven by the relative size of the gap between industry output and national output compared with the historical gap. Hence, if manufacturing is expected to decline over an extended period, then that gap may

² See <http://www.workplace.gov.au/TrendsInFederalEnterpriseBargaining>

widen. Yet eventually the new gap will become the 'norm' and so the impact on the LPI will lessen, and we will adjust the longer term trends as a result.

These factors and others (collectively defined as 'user adjustments') are included explicitly in the modelling.

That is, of course, entirely appropriate. In the end, the AER has asked for Deloitte Access Economics' opinion on the expected movements in the LPI, rather than simply the results from a Deloitte Access Economics' model.

Indeed, **it would have made more sense to criticise us if we had simply accepted model results with no further consideration.**

2.2 The BIS Shrapnel arguments

The March 2011 BIS report repeats several of the same arguments that they made in their May 2009 report for Jemena Asset Management and their July 2010 report – in effect, that an 'institution-based' approach to wage forecasting such as that used by BIS Shrapnel is preferable to the more formal modelling approach adopted by Deloitte Access Economics.

As Access Economics noted in our 17 September 2009 report for the AER, *Analysis of BIS Shrapnel methodology and forecasts*, there are indeed some important advantages in an 'institution-based' approach. That is why, as noted above, we take account of trends in enterprise bargaining in our short term forecasts.

However, as Access Economics' 17 September 2009 report for the AER also noted, we prefer our approach. As we said at the time in response to similar BIS Shrapnel arguments:

"Note that our sectoral wage modelling is not based on econometrically estimated equations (rather, it draws theoretically defensible connections and links them with parameters we have set because we are comfortable with them – rather than because the latest data has moved the econometric equation in a given direction).

Similarly, our sectoral wage model operates in stand alone mode, taking its inputs from the AEM macro model of the Australian economy (and Access Economics' latest forecasts based on that model).

Accordingly, our approach misses some of the key pitfalls noted by BIS.

Moreover, the advantage of a more formal forecasting structure is that it separately quantifies important influences on the wage forecasts. That allows the forecaster to add to or subtract from the base modelled results if there are reasons to do so."

2.3 The BIS Shrapnel econometric analysis

The above comments remain relevant in responding to the arguments raised by BIS Shrapnel in its latest (March 2011) report.

BIS Shrapnel also extends its analysis to an econometric estimation.

On the basis of its results from that econometric estimation, BIS notes (at page A-12) that:

“Our empirical results reveal that sector wage deviations are inversely related to both the cyclical (output) and productivity variables. According to historical data, the higher are the output and productivity deviations (due to a stronger sector), the lower will be the utilities wage deviations and the lower will be the wage escalation for the sector.”

BIS Shrapnel therefore:

- Ignores our point (repeated above) that, whereas our macro-modelling of the economy (and wages) uses econometric estimation, *“our sectoral wage modelling is not based on econometrically estimated equations (rather, it draws theoretically defensible connections and links them with parameters we have set because we are comfortable with them – rather than because the latest data has moved the econometric equation in a given direction)”*.
- The BIS comment in its related report *Wages Outlook for the Electricity Distribution Sector in Victoria* of July 2010 similarly sets up a straw man, noting that *“We (BIS) believe that BIS Shrapnel’s model of wage determination is superior to methodology utilising purely econometric regression techniques to forecast wages, particularly at the industry sector level.”* Deloitte Access Economics agrees – and that is not what we do.
- Deloitte Access Economics does not use econometric estimation for sectoral wage modelling because it risks falling into the exact same pitfalls that BIS Shrapnel’s attempts at it do – that is, sectoral level data are less reliable than their national counterparts, and hence they can produce perverse results.
- That is exactly as BIS Shrapnel’s sectoral level econometric estimation does in this case – it generates perverse results. The policy import of BIS Shrapnel’s finding is that, for the purpose of its forecasting, the AER should assume that rapid growth and strong productivity gains in a given sector will result in relatively weaker wage gains in that sector over time.
- That is not a conclusion we would endorse. Nor, we note, would it appear to be one that KPMG Econtech would endorse. That latter’s report³ listed four factors as drivers of labour cost growth in a given industry – changes in the demand and supply for labour; inflation; increases in productivity; and inter-sectoral and inter-regional competition factors. That list explicitly includes productivity and implicitly includes relative output growth rates (as these affect labour demand).
- The reason why BIS Shrapnel’s sectoral level econometric estimation generates perverse results in this particular case is because one of the explanators dominates the others – for much of the last decade the utilities sector has had to respond to shifts in the wages on offer in competing industries as the long running China boom has boosted demands for particular skills (and in particular regions).
- In contrast to the ‘straw man’ version of it caricatured by BIS Shrapnel, and as we have previously indicated, Deloitte Access Economics’ approach draws theoretically

³ KPMG Econtech, *Assessment of the AER’s Draft Declaration on Labour Cost Escalation: Victoria*, 13 July 2010, at page 17.

defensible connections and links them with parameters we have set because we are comfortable with them. We do not impose econometrically-determined parameters into the future because, as is true for the estimates developed by BIS Shrapnel, they risk making no sense.

On a more technical note, we would point to the results of the regression undertaken by BIS Shrapnel on page A-12. In it, the coefficient on the deviation from competitor wages is found to be negative (and, indeed, greater than minus one). This is despite the fact that Chart 3.2 would suggest the relationship between the two is more positive than anything.

This may well be the result of the strong multicollinearity between the explanatory variables – with the final results largely the results of spurious regression. This suggests that a regression form for the equations is not helpful. That is one of the key reasons why we have not used this approach.

More broadly, we would note that the BIS Shrapnel approach risks simply extrapolating the past into the future. The latter approach makes too little use of the ‘toolkit’ provided by economics.

In the current case, and as we have noted in our past comments on the BIS forecasts, the latter imply a permanently widening wage differential in favour of the utilities sector.

Even if there are some reasons to expect strength (for example, continuing good growth in China), there are stronger reasons to expect wage differentials to narrow over time.

For example, sustained periods of relative sectoral wage strength tend to then get eaten away over time because:

- Workers can move between and within sectors.
- Existing workers in that sector can delay their retirements or exits.
- More students can be expected to seek out employment in the sector, given the increased attractiveness of wages in that sector.
- Workers can move to Australia from other nations (and move into that sector).
- Permanent and temporary (visa 457) migration may play a similar role, with a clear intent of policy being to address any areas of skill shortage.
- There may be similar shifts into the relevant sector in Australia by returning expatriate Australian workers or by New Zealanders (who face fewer restrictions on migration).

Accordingly, the fact that relative wages have diverged in history does not – as the BIS Shrapnel approach appears to assume – mean that those moves are permanent.

3 The best measure: AWOTE or LPI?

The second issue that the AER has asked Deloitte Access Economics to address is the key underlying difference between the two approaches, the question of whether using AWE wage measures (as opposed to LPI measures) is preferred.

The BIS Shrapnel report *Wages Outlook for the Electricity Distribution Sector in Victoria* of March 2011 argues (at pages A1 and A2) that:

“... the LPI reflects pure price changes, and does not measure variations in quality or quantity of work performed. However, like the CPI (Consumer Price Index), the weights are fixed in a base year, so that the further away from that base and the more the composition of the labour market changes over time, the more ‘out of date’ the measure becomes.

Importantly, the LPI does not reflect changes in the skill levels of employees within industries or for the overall workforce, and will therefore understate (or overstate) wage inflation if the overall skill levels increase (or decrease). The labour price index is also likely to understate true wage inflationary pressures as it does not capture situations where promotions are given in order to achieve a higher salary for a given individual, often to retain them in a tight labour market.

Average weekly earnings would be boosted by employers promoting employees (with an associated wage increase), but promoting employees to a higher occupation category would not necessarily show up in the labour price index. However, the employer’s total wages bill (and unit labour costs) would be higher.

For this reason, BIS Shrapnel prefers using AWOTE as the measure that best reflects the increase in wage cost changes (or unit labour costs, net of productivity increases) for business and the public sector across the economy. On the other hand, labour price index can be used as a measure of underlying wage inflation in the economy.”

3.1 The Deloitte Access Economics view

The Deloitte Access Economics view on these matters was covered in our initial report to the AER of 19 September 2009.

In that report we quoted the Australian Bureau of Statistics at length from the October 2005 issue of *Australian Labour Market Statistics* (catalogue 6105.0).

As the ABS noted in that publication:

“Information on changes in the price of labour is available from the quarterly Labour Price Index (LPI). The LPI is compiled from information collected from

businesses on changes in wage and non-wage costs. Information collected on wages is used to produce a Wage Price Index (WPI).

The WPI was first compiled for the September quarter 1997 and is the main ABS measure of changes in wages. The WPI measures quarterly changes over time in the cost to an employer of employing labour, and is unaffected by changes in the quality or quantity of work performed.”

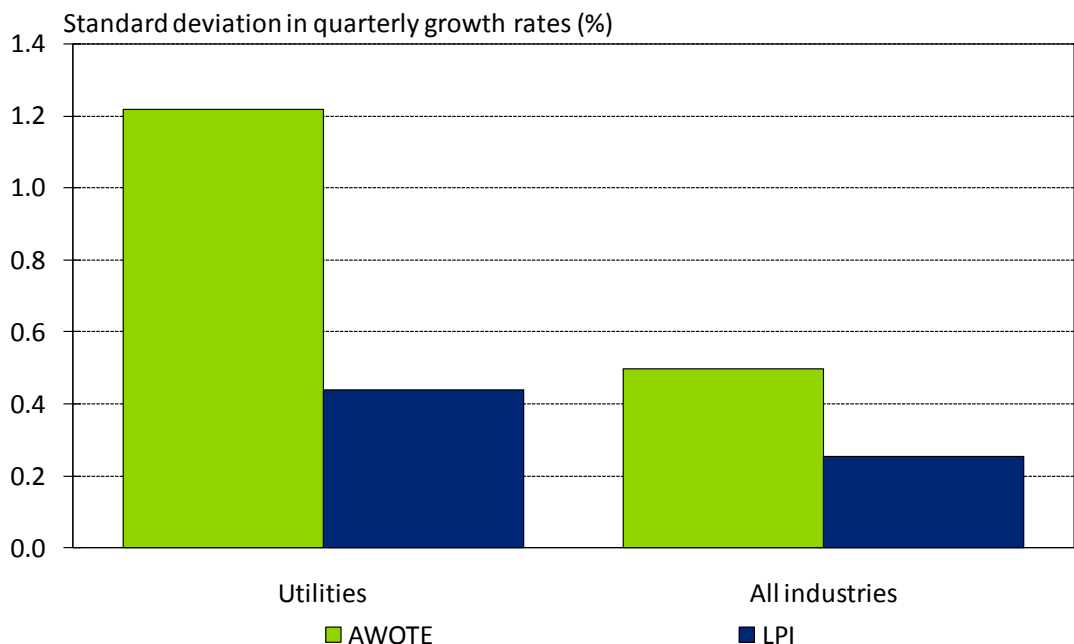
As the above discussion from the ABS suggests, they see the LPI as their preferred measure for “changes in the price of labour”.

That is the task at hand here, and hence the LPI (excluding bonuses) is Access Economics’ preferred measure for this type of analysis.

Indeed, the LPI was originally developed because of the shortcomings of existing wage measures for this type of analysis. For example, AWOTE is affected by shifts in the composition of employment. For example, if a sector employs relatively more high paid full time workers over time (as has happened, for example, in the manufacturing sector as low skilled jobs have been lost to competitors in developing Asia), then that will tend to raise measured AWOTE even if the wage levels for a given level of skill have not changed at all.

Those compositional effects tend to make AWOTE far more volatile than the LPI. Chart 3.1 shows the standard deviation in quarterly growth for AWOTE and LPI in the utilities sector and across all industries over the past decade. The chart shows that AWOTE has been notably more volatile than the LPI over the last decade.

Chart 3.1: Standard deviation in quarterly wage growth, ten years to December 2010



Source: ABS, Deloitte Access Economics

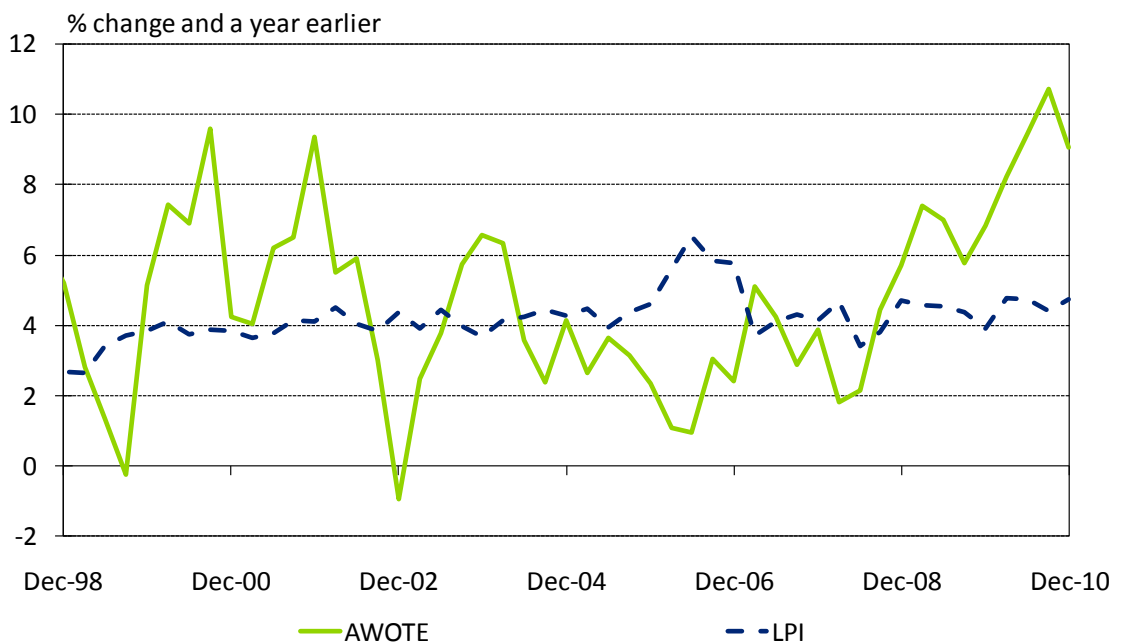
These volatility problems become more pronounced at greater levels of disaggregation, with the difference in volatility more pronounced in the utilities sector than across all industries as a whole (quarter-to-quarter changes are some three times more volatile for the AWOTE measure than the LPI measure).

As the analysis at issue here is not merely at the sectoral level, but at the sectoral by State level, these volatility problems rapidly compound.

These compositional effects and the resultant volatility make AWOTE a poor base for undertaking wage forecasts for the utilities sector. The volatility in the series does not accurately reflect wage outcomes for utilities employees, and can result in starting point (or “jumping off”) problems at the beginning of the forecast period.

The latter point is highlighted by Chart 3.2 below. It shows year-to growth in AWOTE and LPI for the utilities sector.

Chart 3.2: Growth in AWOTE and LPI, Australian utilities sector



Source: ABS, Deloitte Access Economics

While the greater volatility in the AWOTE series compared to the LPI series is clear, the chart also shows a recent surge in wage growth as measured by AWOTE. Utilities wages grew by 10.7% over the year to August 2010 according to the AWOTE measure – nearly two-and-a-half times the pace recorded by the LPI series – before easing to 9.1% in the year to November 2010.

More broadly, compositional changes arising from the business cycle, changed educational levels, the pace of recruitment and retirement, the degree of outsourcing, changed relativities in the employment of men and women and compositional changes arising from shifts in average hours worked can all distort AWOTE as a proxy for “changes in the price of labour”.

That said, ‘best measure’ is not the same as ‘perfect measure’, and there are also drawbacks to using the LPI.

First, the LPI is published by State and by sector separately, but not by State and by sector. That is, the LPI for NSW is published, and the mining sector LPI is also published, however the NSW mining sector LPI is not. The latter data is only available by special request and, in the case of small sample sizes, the ABS does not release their estimates. In contrast, more series at the ‘by State and by sector’ level are available for AWOTE from the ABS 6302.0 release.

However, it is possible to ‘back out’ reasonable estimates of LPI at the ‘by State and by sector’ level. Appendix E of our 19 September 2009 report discusses how Deloitte Access Economics does that. The resultant series are rather less volatile than the matching ABS AWOTE series.

Second, it is sometimes relevant that the composition of the workforce is changing. That is particularly true in analysing the implications of wage developments for the Australian economy as a whole. For example, and as BIS Shrapnel note here, promotions are easier to get during a sustained expansion, reflecting the strength of cyclical demand rather than pure productivity. Other things equal, that adds to total incomes in the economy, but doesn’t show up in the LPI (which does not ‘recognise’ that people at a certain seniority today are, on average, different to those who were at that level some years past).

As the LPI has only existed since 1997, and Australia’s long economic expansion began in 1992, there is an argument that the LPI has understated true ‘like-for-like’ wage gains across most of the time it has been in existence.

However, that bias is unlikely to have been large, and must be measured against the rather more significant types of problems with AWOTE measures discussed above (and highlighted even at the national level in Chart 3.1 and Chart 3.2).

3.2 Compositional change: The numbers

Deloitte Access Economics has also evaluated the how significant any adjustment for compositional change is in the case at hand here. This work drew on a report by Professor Jeff Borland, ‘Labour Cost Escalation report’ prepared for Envestra limited, dated 23 March 2011.

Professor Borland argues that the Access Economics’ example is “misleading” in part because labour turnover is quite high. Hence Professor Borland’s Table 1 (following his Paragraph 10) provides a benchmark for quantifying the impact of compositional change on wage costs in the utilities sector in recent years.

The table below replicates that used by Professor Borland, but adds the relevant wages for these occupations as at August 2008.

It would be preferable to use the wages attaching to these occupations in the utilities sector itself, rather than for Australia as a whole, but these data are not available at that level of disaggregation. However, using a proxy of occupational wages at the national level is unlikely to have an impact on the following results.

The additional feature in Table 3.1 below is that, when weighted for relative wages across these occupations, it shows that composition productivity effects in the utilities sector should have been reducing the average wage payable in the sector by about 0.8 percentage points in each of the last two years.

Table 3.1: Impact on average wages of compositional change in employment in the utilities

	Wages as at August 2008 (\$)	Share (%) Nov-08	Share (%) Nov-09	Share (%) Nov-10
Managers	\$ 1,405.90	12.2	10.6	11.2
Professionals	\$ 1,488.80	17.6	16.3	14.2
Technicians and Trades Workers	\$ 1,083.30	23.6	27.6	25.4
Community and Personal Service Workers	\$ 880.50	-	-	-
Clerical and Administrative Workers	\$ 945.30	19.6	19.5	22.4
Sales Workers	\$ 933.60	3.4	2.4	3.0
Machinery Operators and Drivers	\$ 1,039.40	14.2	13.8	15.7
Labourers	\$ 847.30	9.4	9.8	8.3
All occupations				
Weighted average AWOTE		\$ 1,133.47	\$ 1,123.90	\$ 1,115.07
Change due to compositional effects			-0.8%	-0.8%

These calculations indicate that the utilities sector has been saving money by, on average, moving to a less skilled workforce.

As a key issue here is whether AWOTE or LPI is the better measure to base the AER's judgements on, it is therefore particularly noteworthy that this calculation shows that compositional effects do not explain the gap.

Indeed they go the other way.

3.3 Further issues

The ABS is currently reviewing its production of AWE and AWOTE measures at the industry by State level (that is, the AWOTE for the utilities sector in South Australia and Queensland). This information was communicated to subscribers at the time of the ABS' release of December quarter 2010 data.

One of the reasons for this change is the high standard error of the estimates for these series. In the case of the AWE/AWOTE publication, sample selection is stratified across States and across industries, but not both. That means that as the businesses in the sample change from quarter to quarter (and about 8% of the 5,000 do each time) there is no guarantee that the State by industry samples can be readily compared.

This problem obviously leads to questionable comparability of detailed AWE/AWOTE results from quarter to quarter as the changes may be driven by changes in the sample, rather than changes in wages.

The LPI, by contrast, suffers as little as possible from this problem because their sample follows specific "jobs" over an extended period (at least five years). This limits the rotation problems that the AWE/AWOTE series is suffering from.

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