Making sense of the Hunter unemployment rate

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Since January, there has been a dramatic drop in the Hunter's unemployment rate from 11.3 per cent to 5.4 per cent in October. Over the same period, the unemployment rate for NSW has dropped from 6.7 to 5.2, and for Sydney from 5.8 to 4.7, percent. As one who has been somewhat of a doomsayer about local economic prospects, should I now be 'eating my words'?

Let's do some detective work before we get carried away. The declining unemployment rate reflects an improving, but fragile, local economy in line with national trends. But, more significantly, it reflects statistical volatility.

To understand statistical volatility, we need to look at how the unemployment rate is calculated. Every five years the Australian Bureau of Statistics (ABS) conducts the Census to count us all up. At the same time, it collects data on the labour force. The labour force is everyone over 15 years who is either employed (working at least one hour a week) or unemployed. The unemployment rate is total unemployment as a percentage of the labour force.

So every five years, for the Hunter Statistical Region we have an accurate population and labour force count. But in between each Census the ABS generates more up-to-date statistics. Sophisticated modelling of births, deaths, and migration patterns is done to estimate the population, but this is prone to errors. And every month, the ABS conducts a labour force survey based on a sample of 30,000 dwellings or about 0.5 per cent of the Australian population. This sampling process is also error prone.

To avoid overburdening any one household, 1/8 of the sample is changed every month. The characteristics of the households added each month, may not reflect the characteristics of those who drop out. This leads to substantial volatility in the month-to-month estimates of employment and unemployment.

The size of the Hunter Region sample in the labour force survey is proportionate to the Hunter's share of the Australian population, and is updated after each Census. But each month the ABS has to reconcile their sample labour force estimates with their population projections. This introduces another source of statistical volatility.

For the Hunter, the estimate of the labour force (the employed plus the unemployed) plus the estimate of those not in the labour force must equal the projected Hunter population. The sample labour force estimates are 'adjusted' to achieve consistency but there can be quite large errors.

For example, between June and July the Hunter's population was estimated to have fallen by 9,000 and its labour force by 8,000. In the next month, the population increased by 26,000 and the labour force 23,000. Clearly, these big movements are not happening. They are statistical sampling quirks.
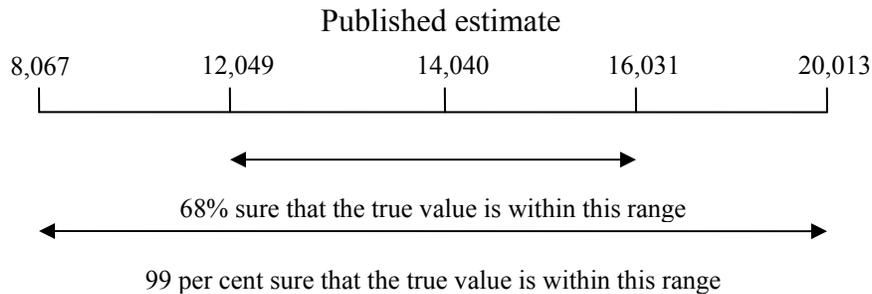
But when economists make predictions we base them on these sample estimates. We try and make general statements about the population based on what is observed in small samples that are prone to large errors.

This is why economists are always wrong!

To help, the ABS publishes an estimate of this 'error' (the standard error), which is used to make statements of confidence about the published estimates. So I might say I am 99 percent confident that the true level of unemployment in the Hunter lies between one figure and another. The larger the standard error, the less confident I am that the published figure is a reliable indicator of the unemployment situation.

The standard errors for Hunter labour force estimates are large. In October the ABS estimates that Hunter unemployment was 14,040. Using the standard errors, I would be 99 per cent sure that the true Hunter unemployment was between 8,067 and 20,013 (see Figure 1). Not a very accurate science at all.

Figure 1 Confidence intervals around estimated Hunter unemployment

Published estimate

| 8,067 | 12,049 | 14,040 | 16,031 | 20,013 |

68% sure that the true value is within this range

99 per cent sure that the true value is within this range

To complicate matters further, the ABS also corrects data for seasonal patterns. The 'seasonally adjusted' Hunter unemployment rate in October is around 6 per cent.

Figure 2 ABS Published Hunter unemployment rate, upper and lower bounds of confidence and underlying trend, 2002
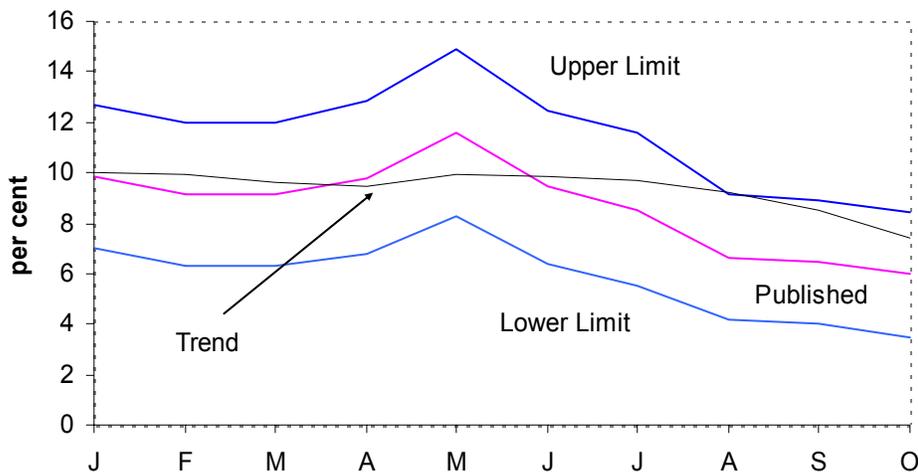
Using the seasonally adjusted data and the standard errors, I have calculated the upper and lower bounds of confidence for the published Hunter unemployment rate over 2002 (see Figure 2). The middle line in the chart is the ABS estimate of the unemployment rate. So in October, I would be 99 per cent sure that the true Hunter unemployment rate was somewhere between 3.5 and 8.4 per cent.

What should we make of all this? Wise heads use the underlying trend to assess how things are moving. One such measure (a 5-quarter moving average) suggests the Hunter unemployment rate in October was 7.4 per cent. This is more realistic and close to the upper bound in the chart.

The message for the Hunter is that things are getting better but not to the extent that an unemployment rate of 5.4 per cent would suggest. Unemployment is still a very major problem and more vigilance is required before we start partying!