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Labour underutilisation and regional labour force data estimates

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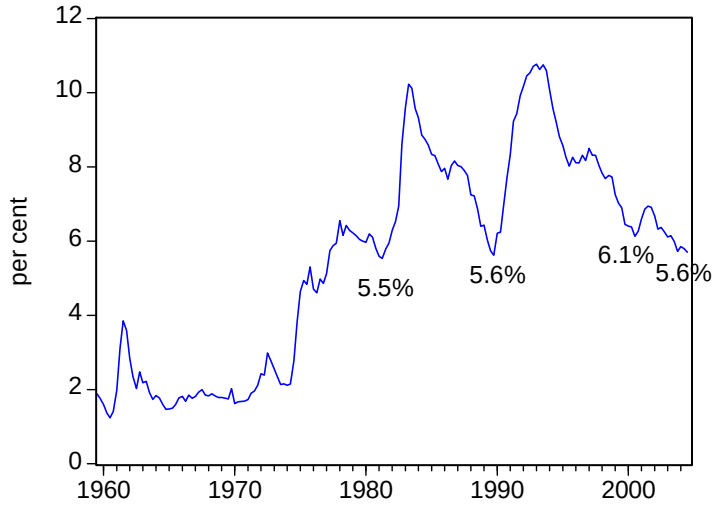
1. Introduction

In the recent Federal election campaign the issue of labour underutilisation was implicitly assumed away by the emphasis by both major parties on the (alleged) on-going strength of the national economy. The declining official unemployment rate is cited as evidence that the economy is robust. It is also increasingly apparent that many regional organisations and press sources are using the Australian Bureau of Statistics (ABS) regional Labour Force Survey (LFS) data, particularly the unemployment rates, to make political statements about how the local economies are profiting from the national growth.

This paper addresses the problems that pervade both aspects of LFS use. The reality is that underutilisation of labour remains the largest problem facing policy makers despite the lack of political will to address it. Figure 1 shows that the low point unemployment rate in Australia has ratcheted upwards over successive cycles in Australia since 1975. The Australian economy is now precariously balanced given rising world oil prices and the fragile household balance sheets (due to record personal debt levels).

Figure 1 Official unemployment rate, Australia, 1959 to 2004



Source: ABS TRYM model database.

The problem is, however, worse than depicted in Figure 1. In this paper, we draw on previous work by Mitchell and Carlson (2001, 2003) and show that official unemployment data severely understates labour underutilisation? The latest CofFEE Labour Market Indicators (CLMI) published by the Centre of Full Employment and Equity (CofFEE), which use algorithms developed in Mitchell (2001b) and Mitchell and Carlson (2001, 2003) show that labour wastage remains at around 11 per cent when broader measures of labour underutilisation are considered.

Even using the official unemployment data derived from the LFS, Table 1 does not reveal dramatic improvements in the labour market between 1997 and 2004. While some reductions are apparent in long-term unemployment (unemployment spells over 52 weeks), which confounds those who believe that the long-term unemployed constitute a growth constraint, Table 2 shows that unemployment durations for most groups are largely static. A substantial number of workers are being left behind by the failure of the economy to produce enough jobs. For workers who remain long-term

unemployed, average duration of unemployment has risen to 178 weeks from 137 weeks over this period. For those who have been unemployed for longer than 2 years their average duration is now 261 weeks (rising from 206 weeks). This data hardly signifies a robust economy.

Table 1 Temporal composition of unemployment, Australia, 1997-2004,

	0-26 weeks		26 - <52 weeks		52 < 104	> 104	LTU		Total
	000s	% Total	000's	% Total	000's	000's	000s	% Total	000s
1997	364.7	46.1	138.2	17.5	109.8	114.7	224.6	28.4	791.0
1998	387.6	49.4	118.9	15.1	99.1	115.0	214.1	27.3	785.1
1999	373.1	52.0	94.9	13.2	77.5	107.0	184.5	25.7	717.7
2000	364.2	54.4	84.0	12.6	60.5	93.2	153.7	23.0	668.9
2001	420.0	57.4	96.3	13.2	58.1	86.6	144.7	19.8	731.6
2002	405.6	57.4	88.4	12.5	58.3	83.9	142.1	20.1	706.0
2003	398.5	58.5	82.5	12.1	53.4	76.5	129.9	19.1	681.5
2004	389.6	59.4	73.6	11.2	52.8	68.9	121.7	18.6	655.6

Source: ABS Ausstats, 6291014a. LTU is long-term unemployment which is all unemployment greater than 52 weeks. 1997 is average from September to December and 2004 is average from January to September.

Table 2 Average duration of unemployment (weeks) by length of unemployment

	Period of unemployment in weeks							
	< 4 weeks	4 < 13 weeks	13 < 26 weeks	26 < 52 weeks	52 <104 weeks	> 104 weeks	Total	Total LTU
1997	1.9	6.8	17.3	35.2	65.0	205.7	52.9	136.8
1998	1.9	6.8	17.3	33.6	64.7	204.1	51.7	139.7
1999	1.8	6.8	17.2	33.4	64.7	204.4	50.6	145.9
2000	1.7	6.7	17.3	33.6	63.9	210.0	48.3	152.4
2001	1.7	7.2	18.1	35.5	67.4	229.6	46.4	164.6
2002	1.6	7.3	18.3	35.9	68.8	240.8	48.3	170.4
2003	1.6	7.2	18.3	36.0	69.2	245.2	47.0	173.0
2004	0.0	7.3	18.3	36.2	69.8	260.5	46.8	177.7

Source: see Table 1. Total LTU is average duration for total long-term unemployed.

Policy makers in almost all OECD economies vigorously pursue labour market programs that erroneously locate the source of the problem within the attitudes and motivations of the individual and/or in the institutional arrangements in the labour market and largely deny that systemic macroeconomic failure is implicated. Evidence now shows that labour market programs of the type praised by the OECD (2001) have failed to restore full employment by engendering enough paid employment opportunities (Mitchell and Carlson, 2001; Mitchell, 2001a, Cowling and Mitchell, 2003).

This paper extends the two-hours based CLMI measures (developed in Mitchell and Carlson, 2001) to gender and region (defined by state/territory). The resulting

disaggregated measures provide further insights into the distribution of the labour underutilisation in Australia.

The paper also investigates whether robust inferences about regional labour market performance can be drawn from ABS regional LFS data. In recent years there has been a growing emphasis on 'regional Australia' although there is very little understanding of how regional labour markets interact with the national economy (Mitchell and Carlson, 2003). Mitchell and Carlson (2003) show that there are persistent disparities between 'regions', defined in terms of the Australian Standard Geographical Classification (ASGC), in terms of employment growth and unemployment outcomes. Using ABS LFS data at the metropolitan/balance of state level they find, among other things, that a region's unemployment ranking is highly (inversely) related to its employment growth performance.

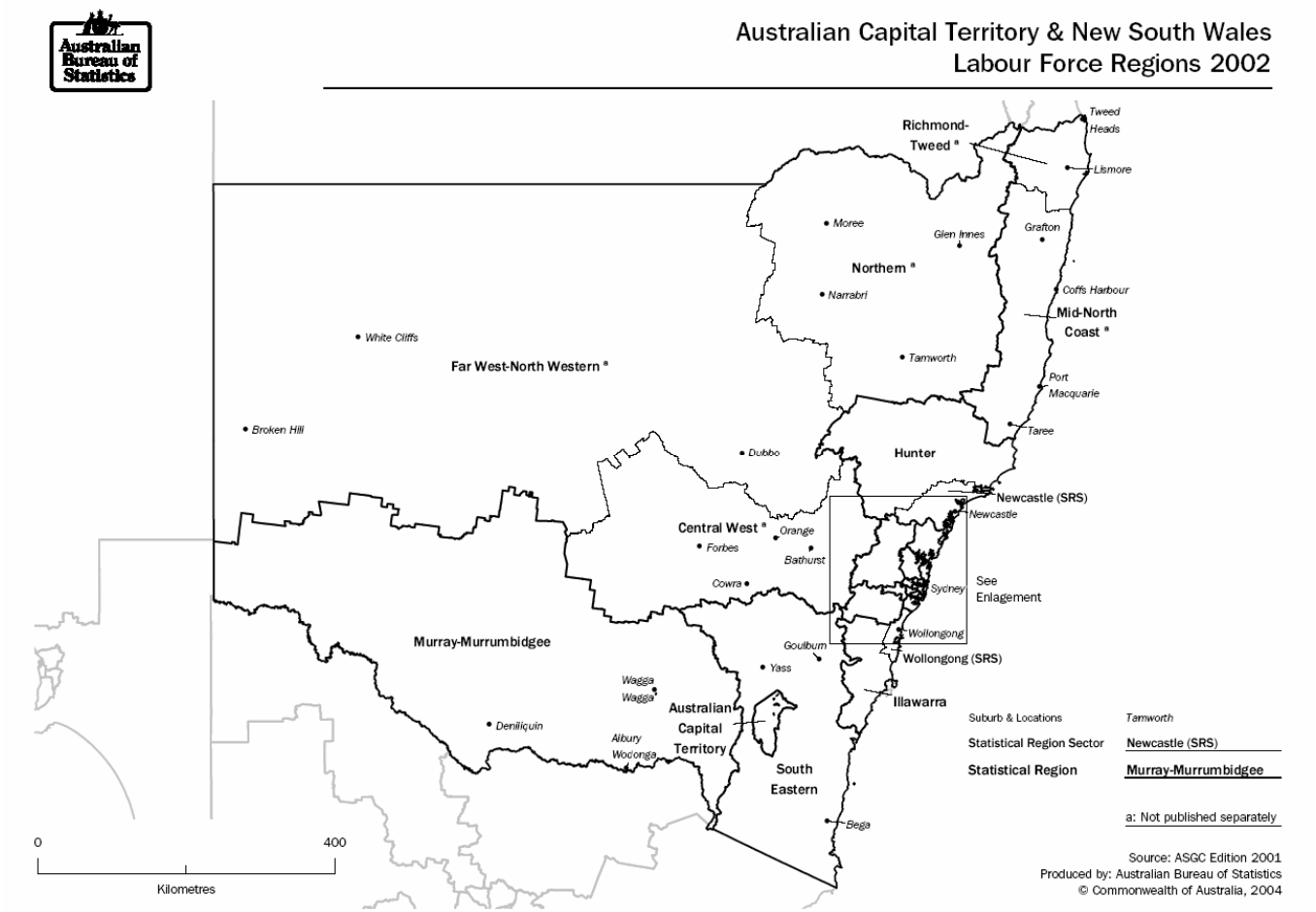
However, to advance this research and further develop regional CLMI, we need to have confidence in the veracity of the regional LFS data published by the ABS. In this paper, it is shown using NSW ASGC regional units (State, the Major Statistical Region (MSR) of Sydney, the Statistical Regions (SR), and the Statistical Region Sectors (SRS) of the Hunter and Illawarra) that such a confidence is unjustified because the sampling errors measured by standard errors are significantly large for many regions below the state level (see Figures 2a and 2b for maps of the regions considered). We do not consider the question of whether the geographic units defined as LFS regions are of economic significance.

The paper is organised as follows. First, revised estimates of the hours-based measures of labour underutilisation in Australia are presented with the gender and regional decompositions introduced. It is concluded that the degree of underutilisation is severely understated by the official unemployment measure. Second, standard errors for regional LFS estimates are computed and lead to the conclusion that extreme caution has to be used in relating these monthly estimates to any underlying labour market activity. Concluding comments follow.

2 The concept of labour underutilisation

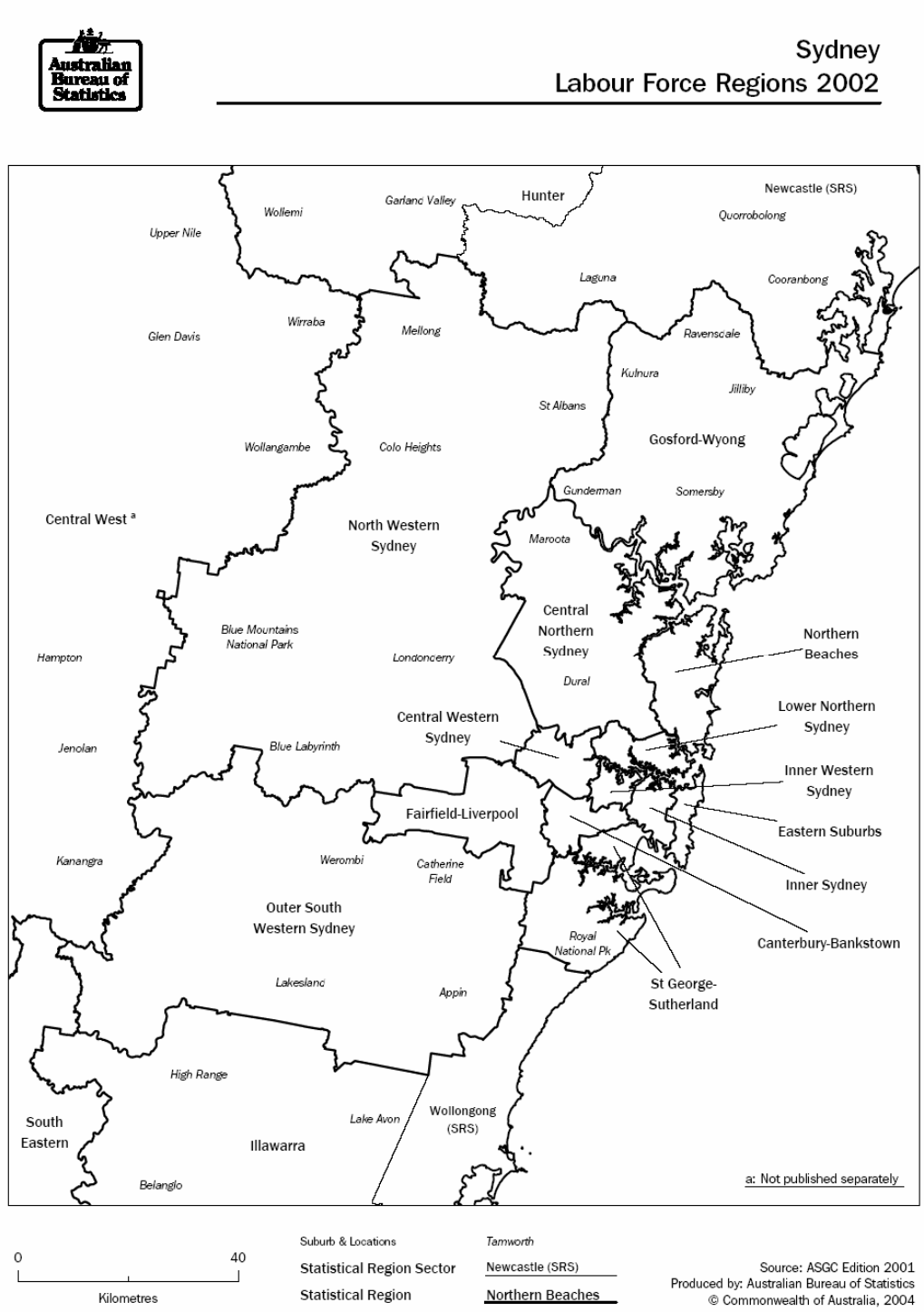
Underutilisation describes the wastage of willing labour resources. It arises for various reasons that can be subdivided into two broad functional categories: (a) *unemployment or its near equivalent* which includes the official unemployed under ILO criteria and those classified as being not in the labour force on search criteria (discouraged workers), availability criteria (other marginal workers), and more broad still, those who take disability and other pensions as an alternative to unemployment (forced pension recipients). These workers share the characteristic that they are jobless and desire work if there were available vacancies. They are however separated by the statistician on other grounds; (b) *sub-optimal employment relations* where workers satisfy the ILO criteria for being classified as employed but suffer "time related underemployment" (ABS, 2001: 55) for example, full-time workers who are currently working less than 35 hours for economic reasons or part-time workers who prefer to work longer hours but are constrained by the demand-side. Sub-optimal employment can also arise from "inadequate employment situations" (ABS, 2001a: 55) where skills are wasted, income opportunities denied and/or where workers are forced to work longer than they desire. In Figure 3, we summarise the main sources of labour underutilisation in terms of labour force status. A more detailed discussion appears in Mitchell and Carlson (2003).

Figure 2a ASGC Labour Force Regions, New South Wales, 2002



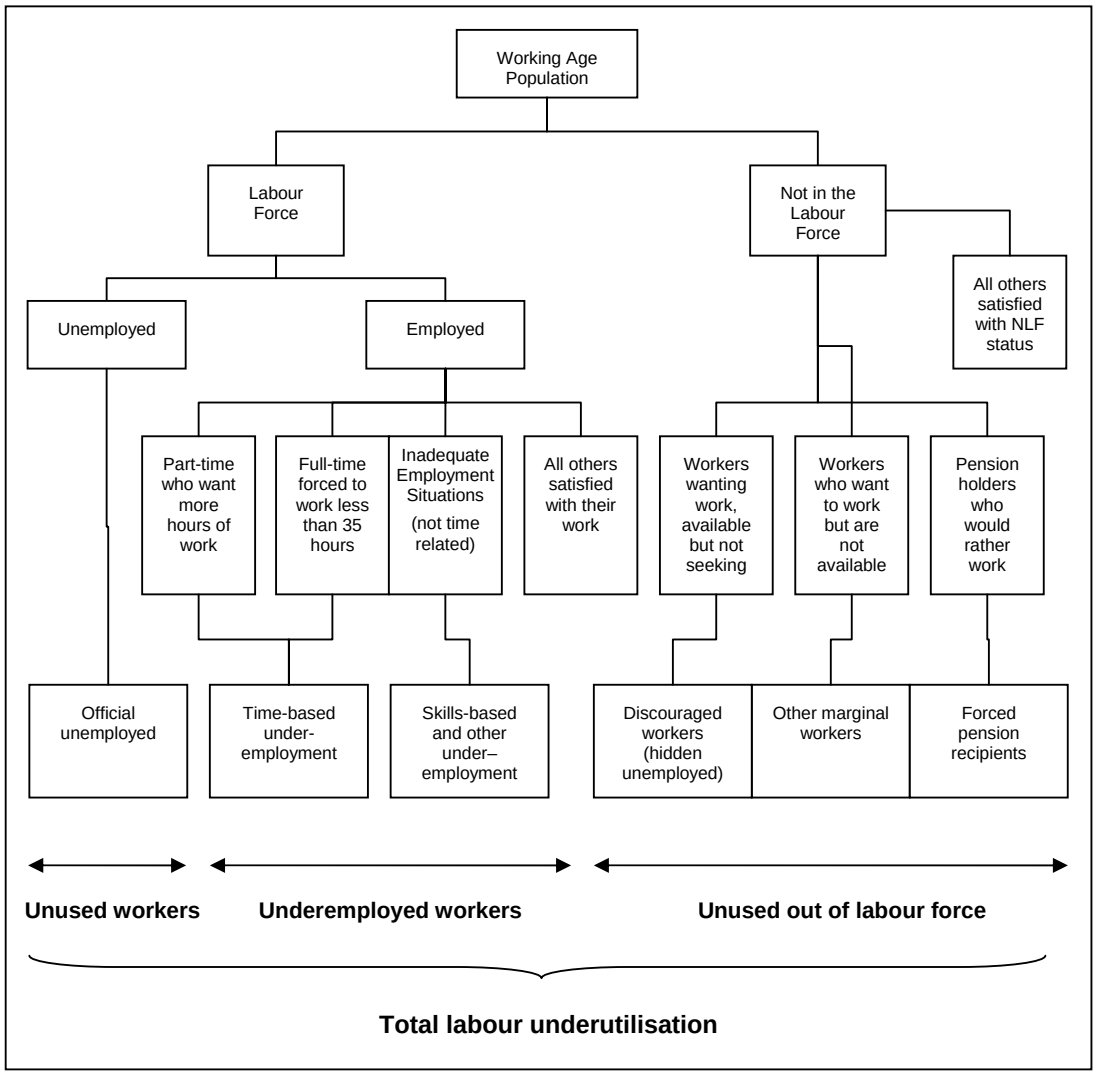
Source: Reproduced from ABS (2004a)

Figure 2b ASGC Labour Regions, Sydney



Source: see Figure 2a

Figure 3 The structure of labour underutilisation



3 Hours-based measures of labour underutilisation

3.1 Conceptual introduction

Following Bregger and Haugen (1995), Mitchell and Carlson (2001) computed several *person-based* measures of labour underutilisation in Australia which broadened the official unemployment rate. They demonstrated that underutilisation grows dramatically as the measure broadens, and that underemployment has worsened over the last decade of growth due to a rising part-time employment ratio being accompanied by a rising undersupply of hours of work relative to the preferences of the workers. Mitchell (2001b) also outlined the CLMI methodology for computing hidden unemployment. To improve on these person-based measures, Mitchell and Carlson (2001, 2003) introduced two new hours-based measures defined as (see Appendix for details):

1. An hours-adjusted labour underutilisation rate (CU7) being a ratio of unutilised hours of work available (unemployed and underemployed part-time workers) to the total available (fully-utilised) labour force in hours (the

numerator plus the full-time employed plus the part-time workers who are content with their working hours);

2. An hours-adjusted underutilisation rate (CU8) including estimates of CLMI hidden unemployment (expressed in terms of a percentage ratio with hours on the numerator and denominator). The derivative underemployment (UE) measure is the difference between CU7 and U3 expressed in hours.

In this paper, we extend these measures by computing underutilisation indicators by gender and region. The disaggregation is limited by published ABS data. We reproduce the ABS conceptual framework for determining underemployment in Figure 4 as it guides the availability of data that we use to construct our own measures. Being hours-based measures, CU7 and CU8 distinguish between full-time and part-time employment, and take into account the fact that a substantial number of part-time workers (and hidden unemployed using CU8) are frustrated by their failure to gain full-time work or more part-time hours. CU8, the hours-based measure augmented by estimates of hidden unemployment is the most comprehensive measure of underutilisation and underemployment.

3.2 National CLMI as at August 2004

Table 3 shows the latest CLMI estimates for the national economy. The overall muted improvement in the labour market is evidenced. While the official unemployment rate (U3) has fallen over the year from 6.0 per cent to 5.6 per cent, underemployment (UE) persists at around 3.4 per cent of the willing labour supply in hours.

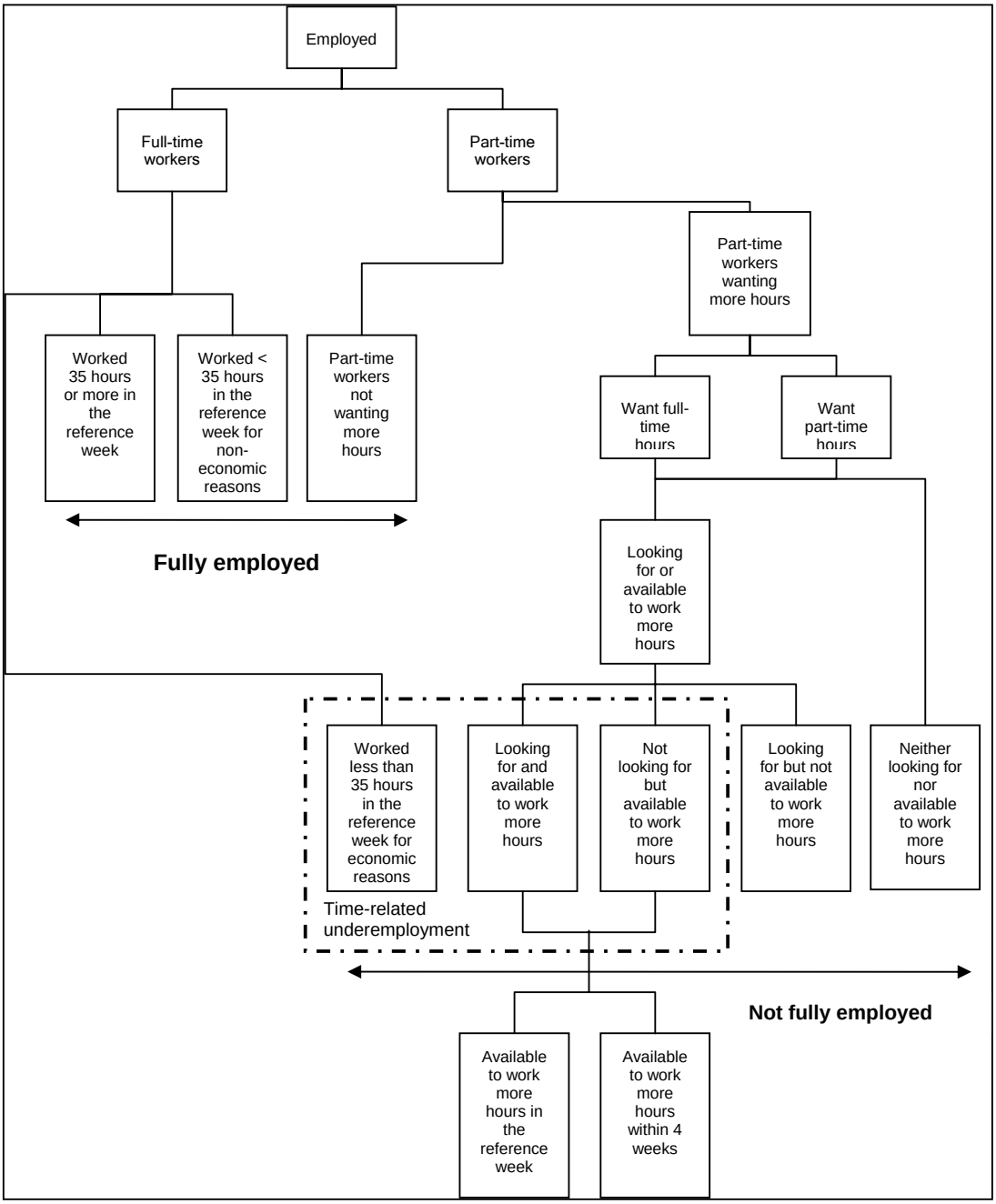
Table 3 CLMI estimates, Australia, August 2003-August 2004, per cent.

Quarter	U3	UE	CU7	CU4	CU8
2003:3	6.0	3.4	9.4	8.1	11.4
2003:4	5.8	3.3	9.1	7.7	11.0
2004:1	5.7	3.1	8.9	7.7	10.8
2004:2	5.6	3.3	8.8	7.4	10.6
2004:3	5.6	3.3	8.8	7.4	10.6

Note: seasonally adjusted estimates.

Figure 5 provides a time series perspective of the different CLMI estimates of labour underutilisation. The gap between U3 and CU7 has risen since 1980, which indicates a rising proportion of part-time jobs are offering less than desired hours of work. The frustration of workers facing rationed hours is also latent among the hidden unemployed. The gap between CU7 and CU8 reflects the magnitude of hidden unemployment and the hours-aspirations of the hidden unemployed. The underutilisation arising from cyclical sensitive participation effects is pronounced with the gap between the measures at its maximum during recession (3.6 percentage points in 1982 and 4.4 percentage points in 1992). The gap narrows as higher levels of activity are achieved (2.1 percentage points at the 1989 peak and 2.3 percentage points in 2000). In the August 2004 quarter, hidden unemployment adds 1.8 percentage points to U3. It has narrowed marginally since the recession in the early 1990s, which suggests that there are fewer persons classified as being not in the labour force that desire and are willing to work. Overall, there is on-going substantial labour resource wastage in the Australian economy.

Figure 4 ABS conceptual framework for underemployment



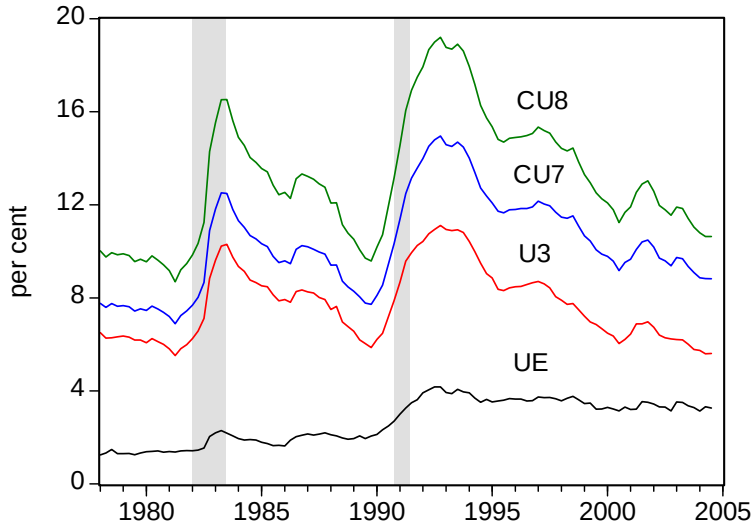
Source: ABS (2001a: Table 5.3, page 59).

While U3, CU7 and CU8 show similar cyclical patterns with pronounced cyclical asymmetry and hysteresis, UE resembles a step function with jumps coinciding with the major downturns over this period. In a downturn, unemployment and underemployment increases as jobs and hours of work are rationed. The losses are compounded by falling labour force participation rates reflected in CU8. As activity increases, more employed workers find full-time hours of work, participation rates increase, and the absolute number of unemployed falls. The indicators clearly lead the peak in real GDP, although UE also led the other indicators into the 1991 recession with CU8 then U3 rising in that order. This suggests that firms adjust working hours

first and labour participation reacts to declining job offers before lay-offs and unemployment increase. During the 1991 downturn, the indicators keep rising long after the trough in real GDP with asymmetries more apparent in the hours-based measures.

The mean shift in UE during this recession supports the view that over the next growth decade, firms consolidated changes in working arrangements, which has allowed them to extend their ability to ration hours more broadly as a vehicle for dealing with fluctuating demand conditions. While the increasing proportion of part-time work is often touted as a reaction to supply side pressures we would highlight the fact that employment growth now produces increasingly fractionalised jobs that are frustrating an increasing percentage of workers (although accurate estimates of underemployment are not available prior to 1978). Full-employment is an option that is now unavailable to an increasing number of workers, despite their preferences.

Figure 5 Official unemployment and hours-based indicators, Australia, 1978-2004



Source: ABS Labour Force, 6203.0 and CLMI (Mitchell and Carlson, 2001). The shaded areas coincide with the peak and trough of real GDP growth in 1982:1 to 1983:3 and 1990:4 to 1991:3.

3.3 CLMI regional breakdown

The regional CLMI are only computable down to state level (excluding the territories) due to data limitations. For the period August 2003 to August 2004, Table 4 shows that most of the improvement in national unemployment has occurred in NSW, Queensland, and Western Australia with Victoria and South Australia experiencing worsening conditions. Their poor unemployment performance is compounded by the deterioration in underemployment. The results are consistent with Mitchell and Carlson (2003).

Figure 6 graphs the official unemployment rate (U3) and the CLMI hours-based measure of underemployment (UE) for each region with the respective national averages over the period 1978 to 2004 shown as the horizontal lines. They show that, in general, regions with above average unemployment also experience the worst underemployment. So both aspects of job deficiency are working together in these economies.

Table 4 CLMI estimates, States, August 2003 and August 2004, per cent.

Region	Quarter	U3	UE	CU7	CU4	CU8
NSW	2003:3	5.9	3.2	9.0	7.9	11.0
	2004:3	5.4	3.2	8.6	7.2	10.4
VIC	2003:3	5.7	3.1	8.8	7.6	10.7
	2004:3	6.1	3.3	9.2	7.9	11.2
QLD	2003:3	6.7	3.9	10.6	9.1	13.0
	2004:3	5.5	3.3	8.8	7.4	10.6
SA	2003:3	6.1	3.7	9.8	8.3	11.9
	2004:3	6.1	4.0	10.2	8.3	12.3
WA	2003:3	6.1	3.4	9.5	8.3	11.6
	2004:3	4.8	2.8	7.5	6.2	8.9
TAS	2003:3	7.0	4.2	11.1	9.7	13.7
	2004:3	6.7	4.3	10.8	9.1	13.2
National	2003:3	6.0	3.4	9.4	8.1	11.4
	2004:3	5.6	3.3	8.8	7.4	10.6

Note: seasonally adjusted estimates.

3.4 Gender CLMI breakdown

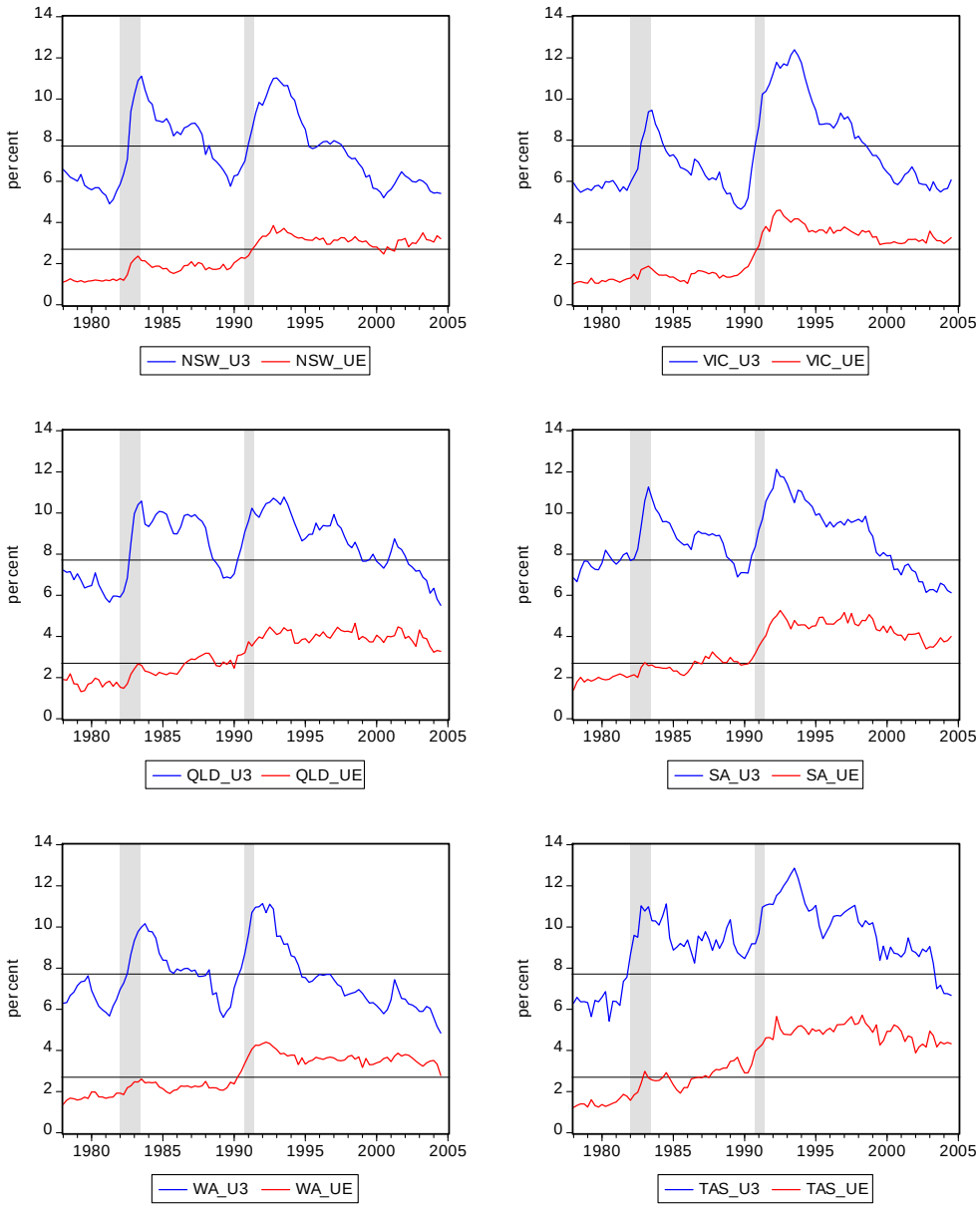
The gender CLMI decompositions are shown in Table 5 and confirm that underemployment is significantly worse for females, which is not surprising given they are disproportionate representation in the part-time workforce. The results also put paid to the notion that the increasing importance of part-time work is in response to the preferences of workers for more flexible work-family relationships.

Table 5 CLMI by gender, Australia, August 2003 to August 2004, per cent

	U3	UE	CU7	CU4	CU8
Females					
2003:3	6.2	5.1	11.3	8.3	13.5
2003:4	6.1	4.9	11.0	8.2	13.2
2004:1	5.9	4.8	10.8	8.0	12.9
2004:2	5.7	5.2	10.8	7.6	12.7
2004:3	5.7	4.9	10.7	7.7	12.6
Males					
2003:3	5.9	2.2	8.1	7.9	10.0
2003:4	5.5	2.2	7.8	7.3	9.6
2004:1	5.6	2.0	7.5	7.4	9.3
2004:2	5.5	2.1	7.6	7.3	9.3
2004:3	5.5	2.2	7.6	7.2	9.3

Source: ABS Labour Force Survey and CLMI modelling.

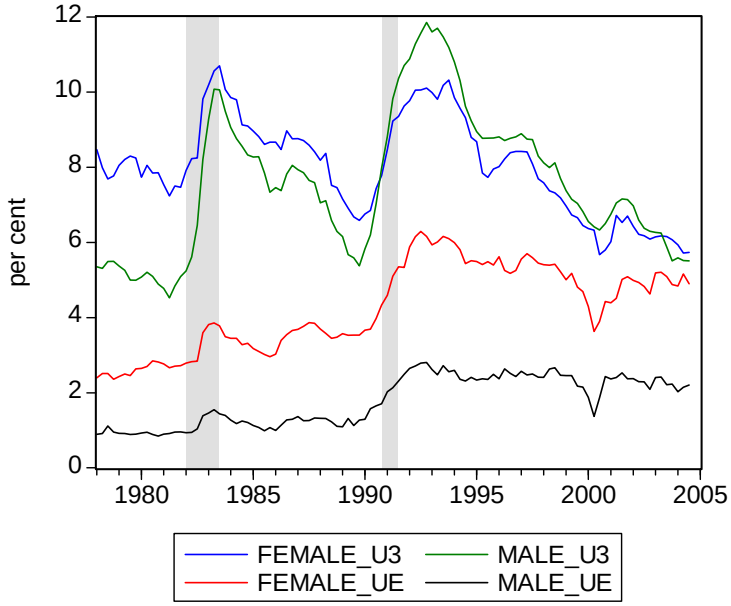
Figure 6 State unemployment and underemployment, 1978 to 2004, per cent



Source: see Table 3. The horizontal lines at values 7.7 per cent and 2.7 per cent are the average national unemployment rate and national average underemployment rate over the sample, respectively.

Figure 7 charts U3 and UE for males and females since 1978. The unemployment experience of males and females has converged over the recent growth phase. It is also clear that the male unemployment rate rose more sharply than for females during the last recession, yet the step increase in underemployment during that period was more pronounced for females (see Mitchell and Muysken, 2003). The cyclical asymmetries are also pronounced. The structural shift during the last recession appears to be a permanent aspect of the Australian labour market for both sexes.

Figure 7 Official unemployment and CLMI underemployment by gender, Australia, February 1979 to August 2004, per cent



Source: ABS Labour Force, 6203.0 and CLMI (Mitchell and Carlson, 2001). The shaded areas coincide with the peak and trough of real GDP growth in 1982:1 to 1983:3 and 1990:4 to 1991:3.

4. Can we reliably use ABS regional labour force data?

Regional LFS data is being increasingly used by press and other organisations 'as if' it was national LFS data – to summarise the 'health' of the labour market. While we have misgivings with the emphasis on national data given the broader CLMI shows significantly worse labour underutilisation which should demand a higher policy focus, additional issues arise when regional LFS data is considered. Two issues of relevance are analysed here: (a) the extent of sampling errors inherent in the regional data; and (b) the correspondence of the LFS geography to underlying regional economic and labour market activity.

In this paper, we examine the first of these issues. Work by Mitchell and Carlson (2003) and Watts (2004) provide some initial insights into the second issue. The concordance of estimated local labour markets and the ASGC is an on-going project within CofFEE and more work will be published in 2005. The early indications are that the ASGC, statistical problems notwithstanding, has serious shortcomings if one is seeking to use it for regional labour market analysis.

4.1 Sampling errors in regional LFS data

Like all surveys, the ABS LFS is sensitive to sampling error because it a subset of the total population. Larger sampling variability reduces the accuracy of the estimates and more caution is needed when using the data. The monthly LFS samples 77 LFS regions which are spatial elements derived from the ASGC which was introduced by the ABS in 1984 (ABS, 2004a). The LFS regions are not based on economic criteria and it is questionable as to whether they have any significant mapping into economic concepts such as local labour markets (see Watts, 2004). The ABS (2004b: 4) urge caution themselves:

> The LFS is designed primarily to provide reliable estimates of the key labour force statistics for the whole of Australia and, secondarily, for each state and territory. The survey is not designed to provide accurate regional estimates. Since estimates for regions are based on much smaller samples they are subject to higher levels of sampling error.

The ABS (2003a) discuss two types of error in survey estimates: (a) *Sampling error* - "the difference between the estimate obtained from a particular sample, and the value that would be obtained if the whole population were enumerated under the same procedures" (ABS, 2003a: 5); and (b) *Non-sampling* error, "which arises from imperfections in reporting, recording or processing of the data that can occur in any survey or census" (ABS, 2003a: 1). In the ABS publications, non-sampling error is not adjusted for but the ABS aim to 'minimise' it through operational efficiency.

Statisticians compute standard errors to measure the degree of sampling error. Standard errors indicate how much the survey estimates can be expected to vary from the true population values as a result of random factors. Survey design aims to minimise standard errors and the ABS review their LFS every five years as part of the *Census of the Population and Housing* to ensure "that the survey continues to accurately reflect the geographic distribution of the Australian population" (ABS, 2003a: 1) subject to cost factors. To improve the reliability of the LFS estimates, the ABS modified their regional benchmarking in February 2004 (ABS, 2004b). Prior to that "population benchmarks in the LFS were classified by state/territory of usual residence, capital city/rest of state, age and sex" (ABS, 2004b: 4). So each month the estimates of Labour Force status are rendered consistent with the 'resident civilian population aged 15 years and over', the latter being based on the five-yearly *Census of Population and Housing*. The population benchmarks are revised monthly using the ABS population trend modelling and substantially revised at every Census. In February 2004, the benchmarks were improved by using "population benchmarks for LFS region by sex" (ABS, 2004b: 4), which provides better employment estimates.

The larger the standard error of an estimate the less reliance the user can place on the value in relation to the 'true' population value. Statisticians compute *confidence intervals* which relate the standard errors to the estimate in such a way that the interval reflects 'how confident' we are that the true population value lies within it. In this paper, the 95 per cent confidence interval is used which is interpreted as saying there are 95 chances out of 100 that the true value will be found within the interval. Merely comparing two standard errors for different estimates can be misleading because the underlying scales might be at odds and so *relative standard errors* (RSE) are used – they are the standard errors expressed as a percentage of the estimate.

In the LFS, the more disaggregated we get in spatial terms the less accurate the estimates become. ABS (2003a: 5), which is an excellent guide to computing standard errors to accompany ABS LFS estimates, notes that "only estimates with relative standard errors of 25% or less are considered sufficiently reliable for most purposes."

We assume the reader is familiar with underlying LFS concepts including: (a) sample design; (b) sample rotation; (c) collection methodology; and (d) scope and coverage (see ABS, 2001).

4.2 Computing standard errors and confidence intervals for regional unemployment rates

The unemployment rate is a percentage ratio of unemployment and labour force estimates. Its relative standard error and its standard error are derived from the respective relative standard errors of the two level estimates using the following relation (ABS, 2003a: 15):

$$(1) \qquad RSE(x/y) = \sqrt{[RSE(x)]^2 - [RSE(y)]^2}$$

where x is the unemployment rate and y is the labour force estimate. The standard error is then given as:

$$(2) \qquad SE(x/y) = \frac{RSE*(x/y)}{100}$$

For the unemployment rate expressed as a percentage the standard error is expressed in percentage points. We form the 95 per cent confidence intervals as:

$$(3) \qquad (x/y) \pm 2*SE$$

We use the spline modelling approach (see ABS, 2003a: Appendix) to computing the standard errors taking into account the difference size of the estimate (scale factor) and the state and national variations. Our study provides a comparison of the State of NSW, the Sydney MSE, the Balance of the NSW, the SRs of NSW (some aggregated) and the SRSs of Newcastle and Wollongong. ABS (2003a: 6) note that while the standard errors derived "only apply to original estimates …a reasonable approximation can be made for the standard errors of seasonally adjusted estimates … using the standard errors for original estimates" Thus the SEs were computed on original data but the confidence intervals and values discussed late use seasonally adjusted data (using X11 methods).

4.3 Improved methods for interpreting regional trends

Astute analysts should not rely on month-to-month changes in LFS estimates to asses the state of regional labour markets. Caution suggests that some measure of the underlying trend using various smoothing techniques be used given the sampling errors. There are several approaches. The commonly used techniques are: (a) Hodrick-Prescott filter; (b) Various moving-average (MA) methods; and (c) Various exponential smoothing filters.

In this paper we only consider a single class of moving average filter namely the Henderson filter. There are many different moving-average smoothing filters available each with different advantages and disadvantages (Diebold, 2001; ABS, 2003b). Major statistical agencies (such as US Census Bureau and ABS) use Henderson symmetric filters as trend estimates (Gray and Thomson, 1996; ABS, 2003b: 120). We follow Doherty (2001) approach in computing our Henderson filtered trends. Several other approaches would yield similar results (see Shiskin, Young and Musgrave, 1967; Laniel, 1985). While not an explanation, we augment the 13-month symmetric Henderson filter (where weights are positive for middle time series observations) with asymmetric or surrogate components (where weights are positive at the series end) to overcome the endpoint problem. That is, we compute full sample trend estimates (using surrogates to forecast and backcast missing estimates in the symmetric filter). We apply the algorithms (programmed in Matlab) to seasonally adjusted regional LFS data.

4.4 Results

Table 6 presents the seasonally-adjusted and trend unemployment rates, 95 per cent confidence intervals, the relative standard errors and the labour force (to show scale) for 22 NSW regions which encompass the State, the MSR of Sydney, the Balance of the State, and the SRs (including the SRS of Wollongong and Newcastle which respectively dominate the Illawarra and Hunter SRs) as at August 2004. The confidence intervals for the major aggregates are very small suggesting the LFS estimates are suitable for inference. However, for Northern Beaches, as an example (RSE = 28.5 per cent), we can be 95 per cent sure the true unemployment rate lies between 1.3 per cent and 4.9 per cent despite the LFS estimate of 3.1 per cent. For reliability we would prefer the trend estimate (2.9).

Table 6 LFS and trend estimates, confidence intervals, NSW regions, August 2004

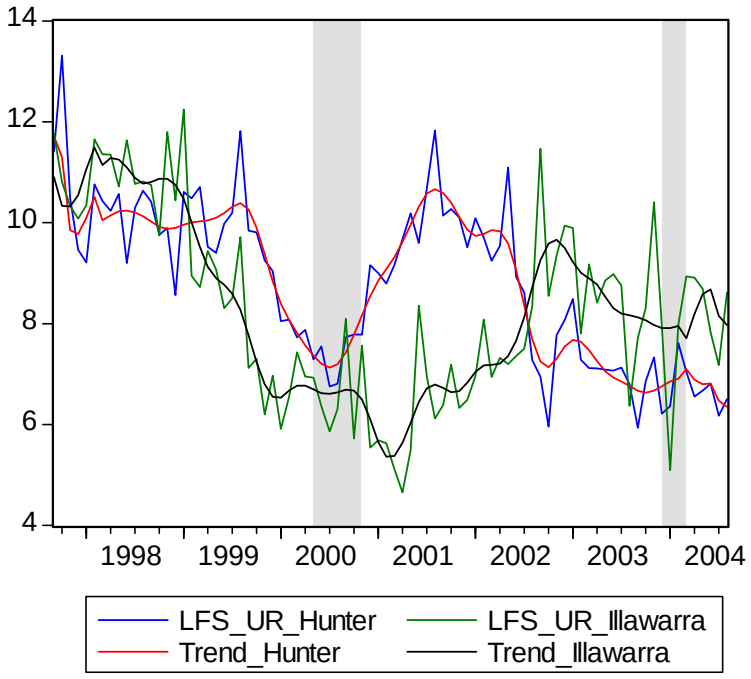
ASGC Region(s)	LF	RSE	UR	95% CI		Trend
	000's	%	%	Lower	Upper	%
New South Wales	3301.8	3.1	5.6	5.3	5.9	5.6
Sydney	2156.5	3.1	4.9	4.6	5.1	4.9
Balance of NSW	1145.3	3.0	6.9	6.6	7.3	6.8
Inner Sydney, Inner Western Sydney	263.4	18.8	4.0	2.6	5.5	4.3
Eastern Suburbs	130.3	27.6	4.1	2.1	6.1	4.7
St George-Sutherland	230.2	22.1	3.5	2.0	4.9	4.3
Canterbury-Bankstown	136.4	19.8	7.7	5.0	10.3	7.7
Fairfield-Liverpool, Outer South Western Sydney	292.9	13.3	7.8	6.1	9.6	7.5
Central Western Sydney	133.9	24.3	4.4	2.2	6.6	3.9
North Western Sydney	294.5	17.0	4.7	3.3	6.1	4.7
Lower Northern Sydney	169.0	26.9	3.5	1.9	5.1	3.5
Central Northern Sydney	225.2	23.2	3.1	1.7	4.5	2.6
Northern Beaches	138.6	28.5	3.1	1.3	4.9	2.7
Gosford-Wyong	142.1	17.6	7.9	5.1	10.7	8.8
Hunter	289.4	14.1	6.5	4.8	8.2	6.4
Newcastle	238.3	15.6	6.5	4.6	8.3	6.3
Illawarra	180.8	14.8	8.6	6.1	11.2	8.0
Wollongong	125.6	18.9	8.7	5.7	11.6	7.0
South Eastern and Illawarra	97.0	27.2	4.6	1.8	7.3	5.0
Richmond-Tweed, Mid-North Coast	196.0	14.4	9.2	6.8	11.6	9.5
Northern, Far West-North Western, Central West	242.8	15.8	7.1	5.3	8.9	6.9
Murray-Murrumbidgee	139.3	24.4	3.5	1.4	5.7	3.4

Source: ABS Labour Force Survey and author's own calculations. The unemployment estimates are seasonally adjusted by the author. LF is the labour force, RSE is the relative standard error of the LFS estimate of the unemployment rate in percent, UR is the LFS estimate of the unemployment rate, 95%CI is the lower and upper 95 per cent confidence intervals, respectively, Trend is the 13-month symmetric Henderson trend with asymmetric surrogate components.

For a major centre such as Newcastle, the confidence interval includes 4.8 per cent and 8.3 per cent with a LFS estimate of 6.5 per cent. The month-to-month point estimate for regions with relatively high RSEs is thus fraught with uncertainty and the trend estimate is preferred. In general, the data is unusable if the RSE > 25 per cent. Values above 15 per cent remain problematic. For the SRs in the sample (September 1997 to September 2004), and noting that some of the regions shown in Table 6 are already aggregates of smaller SRs, around 24 per cent had RSEs > 25 per cent; 47 per cent had RSEs > 20 per cent; and 52 per cent had RSEs > 15 per cent. These summary figures hardly inspire confidence in the reliability of the data. The correlation between Labour Force size and the percentage RSE for August 2004 is -0.74.

Figure 8 compares the LFS and trend unemployment rate estimates for the two coastal SRs adjacent to the Sydney MSR, Hunter (RSE = 14.1 per cent at August 2004) and Illawarra (RSE = 14.8 per cent at August 2004). It illustrates the utility in using the trend rather than the LFS estimate. In the first shaded period, the LFS estimate for Illawarra exceeds the Hunter, whereas in the second period, the opposite occurs. Yet, the trend estimates suggest exactly the opposite conclusion about the relative performance of two labour markets in terms of the unemployment rate. Even though the RSEs for each SR are below 15 per cent, their interaction on a monthly basis leads to difficulties if we want to compare two regions, which in political terms are often seeking resources at the expense of the other from Government.

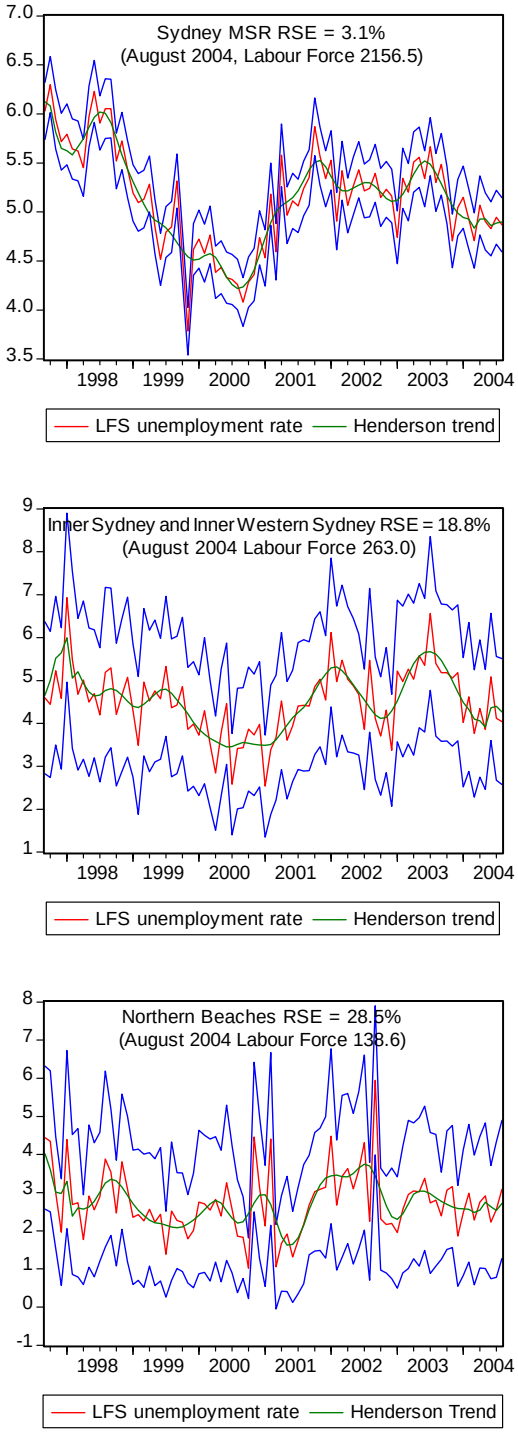
Figure 8 Hunter and Illawarra SRs, unemployment rate and trend, 1997-2004, percent



Source: see Table 6

Figure 9 compares three regions of different scales as at August 2004 – Sydney MSR (labour force 2156.5 thousand, RSE = 3.1 per cent), the combined SRs of Inner Sydney/Inner Western Sydney (labour force 263.4 thousand, RSE = 8.8 per cent), and the Northern Beaches SR (labour force 138.6 thousand, RSE = 28.5 per cent). The 95 per cent CIs are shown together with the LFS and trend unemployment rate estimates. The increasing variability and width of CIs with scale of region is apparent.

Figure 9 Sydney MSR, Inner Sydney/Inner Western Sydney and Northern Beaches SRs, unemployment rates and trends and 95 per cent confidence intervals, 1997-2004

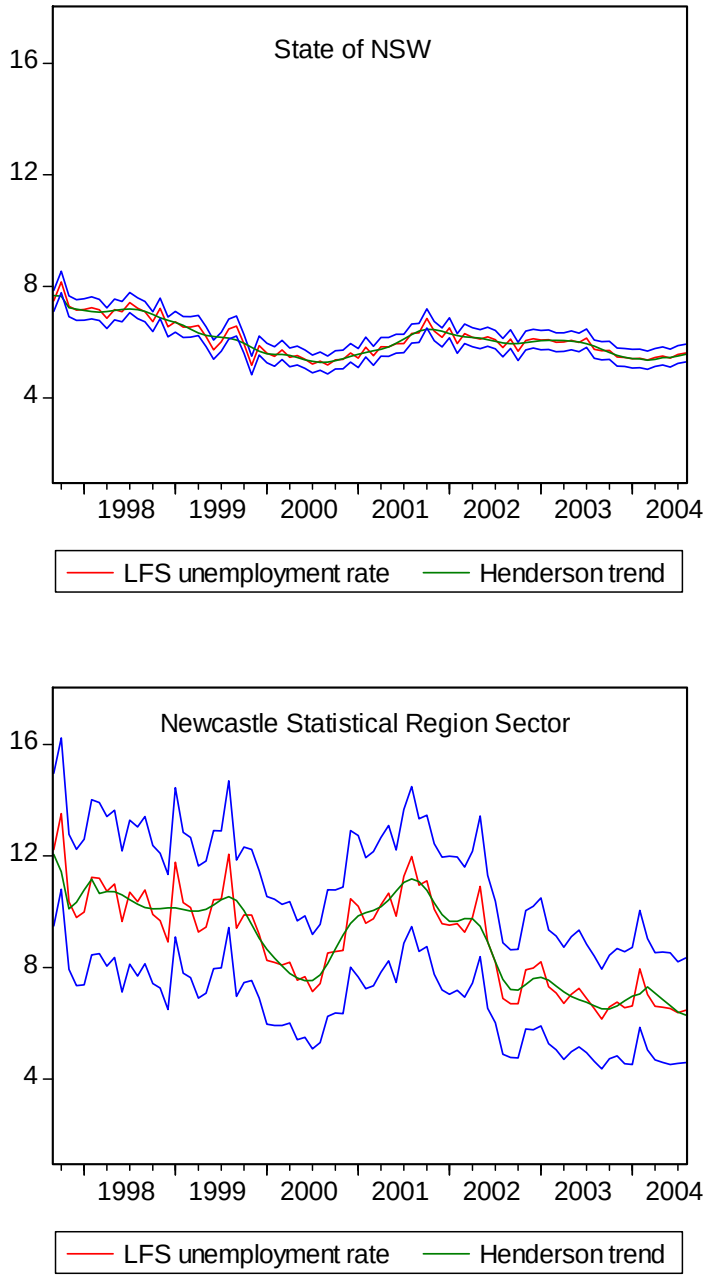


Source: see Table 6.

Finally, Figure 10 shows the LFS and trend unemployment rate estimates and the 95 per cent confidence intervals for NSW (State) and the Newcastle SR Sector (the dominant spatial unit within the Hunter SR). The two charts are forced onto the same

vertical scale to demonstrate the differences in variability and the width of the CIs. In August 2004, NSW had a labour force of 3301.8, an LFS unemployment rate of 5.6 per cent (CI = 5.3 to 5.9 per cent), and the RSE = 3.1 per cent, whereas the Newcastle SRS had a labour force of 238.3 (a relatively large spatial unit in this respect), an LFS unemployment rate of 6.5 per cent (CI = 4.6 to 8.3 per cent) and an RSE = 14.1 per cent. Our interpretation of the fortunes of the two spatial units however would diverge substantially on a month-to-month basis using the ABS regional LFS estimates, whereas the trend measures would give less of an indication of considerable variation.

Figure 10 NSW and Newcastle, unemployment rate and trend, 1997-2004, per cent



Source: see Table 6.

5 Conclusion

In this paper we presented the latest (as at August 2004) CLMI which provide broader measures of labour underutilisation in Australia. We argue that they provide a richer picture of the state of the labour market than is represented by the official unemployment rate published by the ABS. Most importantly, while the aggregate unemployment rate in Australia has returned to levels that existed in the late 1980s (after a severe recession in the early 1990s), the level of underemployment and the impact of marginal attachment have risen over that time.

The two hours-based CLMI indicators of labour market utilisation are also broken down by gender and region. We see that there are considerable regional disparities in terms of labour utilisation rates with chronic issues in South Australia and Tasmania and an increasingly deteriorating situation in Victoria. All regions still suffer from persistent wastage of labour resources. The gender breakdowns show that women are more disadvantaged by underemployment than men, although the trend towards the economy providing increasingly less satisfactory part-time employment opportunities impacts on both sexes.

The indicators taken together show that the Australian economy has failed to generate enough jobs and enough hours of work over the last 26 years or so and now wastes around 11 per cent of its available labour resources. If we include marginal workers other than the discouraged, then the wastage is significantly higher.

The reliability of ABS regional LFS data was also examined and it was concluded that for the majority of SRs using the LFS estimates on a month-to-month basis was not recommended. The current dubious quality of regional LFS prohibits investigating labour underutilisation in any reliable manner at the level below the State/Balance of State. One has to then wonder how a reasoned debate about regional development can occur with such an inadequate empirical base.

Appendix: Derivation of CLMI - Hours-adjusted underutilisation rates

Hours-adjusted labour underutilisation rate

The formula for the hours-adjusted labour underutilisation rate (CU7) is given as:

$$\text{(A1)} \quad \text{CU7} = \frac{PTE_{UH} + UN_{FT} + UN_{PT} + E_{FT<35}}{FTE + PTE_{H} + PTE_{UH} + UN_{FT} + UN_{PT} + E_{FT<35}}$$

where UN_{FT} is the number of unemployed who want full-time work multiplied by the average full-time working hours, UN_{PT} is the number of unemployed workers who want part-time work multiplied by average part-time working hours, PTE_{UH} is the number of part-time workers who want to work full-time expressed in hours as explained below, PTE_{H} is the number of part-time workers who do not want to work more hours multiplied by the hours they are currently working, FTE is total full-time workers multiplied by the average full-time working hours, and $E_{FT<35}$ is the total full-time workers who are forced to work less than 35 hours per week for economic reasons. The numerator and denominator of CU7 are in hours and the ratio is a percentage.

Computing PTE_{UH} and PTE_{H}

The part-time workers are divided into those who want more hours and those who don't wish to work more hours. The part-time workers who are content are divided by the ABS into 4 hours-bands: 0 hours per week, 1-15 hours per week, 16-29 hours per week, and 30-34 hours per week. Average hours per week for each hours-band are also published. The total part-time hours in this category then equals the number of workers in each category multiplied by the relevant average hours. Workers in the 0 hours per week band are treated as if they were in the 1-15 hours-band. The latter assumption introduces some downward bias. The sum of these individual products is the total hours of part-time workers who are content with the hours they are working. These workers are therefore not construed as being underemployed.

The part-time workers who want more hours are divided into two groups: those who want to work full-time and those who did not look for full-time work. The ABS also publishes the numbers of these workers in the hours bands denoted above. For the part-time workers who wanted more hours but did not look for full-time work, we assumed they wanted to be in the next higher hours-band than they were currently working in. Underemployment then is the number of workers in this group expressed in each hours band times the average hours of the part-time workers (who are content) in the next higher hours band minus the actual hours they are currently working. The individual products are summed. The workers in the 0 hours band are treated as before. This generates the first component of underemployed part-time work in hours. The underemployment of the part-time workers who want to work full-time is the number of workers in each hours-band times the average weekly full-time hours minus the hours they are actually working. The individual products are summed. The workers in the 0 hours band are treated as before. This generates the second component of underemployed part-time work in hours. Total underemployment is the sum of these components.

Computing $UN_{FT} + UN_{PT}$

The actual unemployed are divided into those who want full-time work and those who do not. The underutilised hours for those who want full-time work equals the total persons in this category times average weekly full-time hours. For those currently unemployed who want part-time work, their underutilised hours are computed by multiplying the number of unemployed in this category by average part-time hours worked. This gives total unemployment in hours

Computing FTE

This is the number of full-time workers times the average full-time working hours.

Computing $E_{FT<35}$

The ABS publishes data for full-time employed persons who worked less than 35 hours by reason worked less than 35 hours and hours worked. The numbers of workers in relation to the actual hours worked are published in hour bands of 0, 1-15, 16-29, and 30-34. The reasons given for working less than 35 hours can be broken down into economic (working less than 35 hours because of ‘Bad weather, plant breakdown’ or ‘Stood down, on short time, insufficient work’) and non-economic. The ‘hours gap’ was then computed by multiplying the number of workers in each band who were constrained by economic reasons by 35 hours and subtracting the actual hours that they had actually worked.

Hours-adjusted underutilisation rate with hidden unemployment

The formula for the hours-adjusted unemployment rate (CU8) is given as:

$$\text{(A2)} \quad \text{CU8} = \frac{PTE_{UH} + UN_{FT} + UN_{PT} + E_{FT<35} + HU_{FT} + HU_{PT}}{FTE + PTE_{H} + PTE_{UH} + UN_{FT} + UN_{PT} + E_{FT<35} + HU_{FT} + HU_{PT}}$$

where the additional terms are HU_{FT} the estimated discouraged workers who want to work full-time times the average full-time working hours, and HU_{PT} is the estimated number of discouraged workers who want to work part-time times the average part-time working hours. We used the proportions that apply to the official unemployed to allocate the estimated hidden unemployed between the two categories.

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