Centre of Full Employment and Equity

Beyond the unemployment rate – labour underutilisation and underemployment in Australia and the USA

William F. Mitchell and Ellen Carlson[1]

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Abstract

Cross-country comparisons of labour force data are an integral component of comparative policy analysis. The unemployment rate is often used as a summary comparative measure and captures the attention of the media more often than other labour market indicators. A simplistic interpretation of the periodically announced unemployment rates is that a lower figure is better. Economists have long debated the limitations of the aggregate unemployment rate measured in persons. In particular it is based on a narrow concept of underutilisation and ignores underemployment. The existence of discouraged workers is one example of underutilisation of labour resources and is ignored in the standard measure. In terms of underemployment, the growing trend to part-time employment with the additional information that a number of part-time workers desire more hours, shows up another limitation on the usual measure of unemployment.

In this paper, we outline the distinction between underutilisation and underemployment and discuss the limitations of the official unemployment rate as a measure of these sources of resource inefficiency. We then compute a range of measures for Australia based on the BLS six indicators, which are designed to provide better indication of labour slack. We extend the BLS concepts to take into account data variations in Australia compared to the USA. The measures provide a better indication of the extent to which existing and potential labour resources are being under-utilised and therefore, arguably, give a more accurate indication of the degree of tightness in the labour market. In the final section, we present two new hours-based measures of labour underutilisation and underemployment for Australia. The difference between the measures is that one of them includes hidden unemployment. Both measures are computed by the Centre of Full Employment and Equity and published as part of our Monthly Indicators. They attempt to quantify the degree of underutilisation and underemployment among the unemployed, the hidden unemployed, and the part-time workers who desire more hours of work. The comparison with the conventional unemployment leads to the conclusion that the degree of underutilisation is significantly understated by that measure. Concluding comments follow.

"The overall unemployment rate for a country is often the most sought after of all economic statistics. It is a measure of the unutilised labour supply of a country." (ILO, 1999: 191)

1. Introduction

Cross-country comparisons of labour force data are an integral component of comparative policy analysis. The unemployment rate is often used as a summary comparative measure and captures the attention of the media more often than other labour market indicators. A simplistic interpretation of the periodically announced unemployment rates is that a lower figure is better. Sorrentino (2000: 3) says, "comparative levels are considered to be an important measure of U.S. economic performance relative to that of other developed countries. Comparative unemployment rates also provide a springboard for investigating economic, institutional, and social factors that influence cross-country differences in joblessness."

There is a recognition that comparative unemployment rates have to be adjusted to ensure that the conceptual basis is consistent (Shiskin, 1976; Sorrentino, 1993; Bregger and Haugen, 1995). The major labour data gathering organisations have recognised this need and now publish an array of standardised or harmonised unemployment rates. The Bureau of Labor Statistics (BLS) in the USA "has adjusted foreign unemployment rates to U.S. concepts since the early 1960s." (Sorrentino, 2000: 3) Similarly, the Organisation for Economic Cooperation and Development (OECD), the Statistical Office of the European Communities (Eurostat), and the International Labour Organisation (ILO) now convert national statistical data to present unemployment rates within a common conceptual framework. From a research perspective three questions arise. First, once standardisation is achieved it is important to determine the extent to which remaining differences in unemployment rates are due to further measurement variations. Lawrence (1999) argues that if differences in measurement remain and explain variations in standardised unemployment rates then using comparative unemployment rates to justify the policy position of one country over another is futile (see also Sorrentino, 2000). Second,

once all reasonable measurement differences are explained, it is important to explain the remaining differences in unemployment rates in terms of policy and structural factors. Third, if we are examining the unemployment rates as indicators of comparative labour utilisation (or under-utilisation) then the issue of fitness for purpose arises. Economists have long debated the limitations of the aggregate unemployment rate measured in persons. The existence of discouraged workers for example, where important, is one such limitation. The growing trend to part-time employment with the additional information that a number of part-time workers desire more hours, shows up another limitation on the usual measure of unemployment.

In this paper, we are concerned with this last issue as part of a larger project embracing all of the issues, with special focus on Australia, Japan and the United States. The Centre of Full Employment and Equity is currently preparing a range of alternative indicators of labour underutilisation to overcome deficiencies in the conventional official unemployment rate. This paper develops and discusses some of these alternative indicators for Australia and the USA. It is argued that the alternative measures are relatively easy to compute and provide a more meaningful and accurate measure of the degree of labour market tightness.

The paper is laid out as follows: Section 2 reviews the labour force framework developed by the ILO that is the basis for contemporary unemployment data and discusses the limitations of the official unemployment rate as a measure of labour underutilisation. Section 3 considers other perspectives that can be used in measures of labour utilisation and computes a range of measures for Australia based on the six BLS indicators. We extend the BLS concepts to take into account data variations in Australia compared to the USA. The measures provide a better indication of the extent to which existing and potential labour resources are being under-utilised and therefore, arguably, give a more accurate indication of the degree of tightness in the labour market. Section 4 presents for Australia, a comparison of the conventional measures of labour underutilisation (the unemployment rate, the unemployment-vacancy rate, the employment-population ratio) to new hours-based measures of the unemployment rate and an unemployment measure, which explicitly accounts for hidden unemployment. Both measures are computed by the Centre of Full Employment and Equity and published as their Monthly Indicators. They attempt to

quantify the degree of underemployment among the unemployed, the hidden unemployed, and the part-time workers who desire more hours of work. The comparison with the conventional unemployment measure leads to the conclusion that the degree of underutilisation is significantly understated by that measure. Concluding comments follow.

2.   Underutilisation and underemployment

The labour force framework is the foundation for cross-country comparisons of labour market data. The framework is made operational through the ILO and the conference of International Labour Statisticians. These conferences develop the guidelines or norms for implementing the labour force framework and generating the national labour force data. Four organisations compile internationally 'comparable' series of unemployment rates for groups of developed countries.[2] The OECD publishes *Standardised Unemployment Rates* (SURS) for 24 member countries, which are based on the ILO concepts. The Bureau of Labor Statistics (BLS) provides unemployment rates that are adjusted "as closely as possible" to U.S. concepts, which are narrower than the ILO concepts.[3] The Statistical Office of the European Communities (EUROSTAT), has its own interpretation of ILO concepts, and publishes *harmonized* unemployment rates for European Union countries. The ILO publishes ILO-Comparable series of unemployment rates that are consistent with ILO guidelines "except where adjustments are negligible and therefore be disregarded."   (ILO Bulletin, p XI quoted in Sorrentino (2000:20)).

According to ILO concepts, a person is unemployed if they are over a particular age, they do not have work, but they are available for work and actively seeking work. Unemployed people are generally defined to be those who have no work at all. Unemployment is therefore defined as the difference between the economically active population (civilian labour force) and employment. The unemployment rate refers to the number of unemployed persons as a percentage of the civilian labour force. The inference is that the economy is wasting resources and sacrificing income by not providing enough opportunities for work and underutilising labour.

There are, however, other avenues of labour resource wastage that are not captured by the unemployment rate as defined in this manner. In this context, we distinguish

between underutilisation and underemployment. Underutilisation relates to workers who are currently not working but who are willing and able to undertake work whether they are classified as being in or out of the labour force. The unemployed as defined above constitute a subset of the underutilised labour. Underemployment refers to employed workers who are constrained by the demand side of the labour market to work fewer hours than they desire.[4] In conceptual terms, a part of an underemployed worker is employed and a part is unemployed, even though they are wholly classified among the employed.

To develop these concepts further, a number of considerations arise:

(a) Are the unemployed all the same in terms of the signal they send about the state of the labour market? In their alternative measure of unemployment, the BLS take into consideration what they call "more serious types of unemployment – respectively, long-term unemployment, job loss, adult unemployment, and unemployment of seekers of full-time jobs" (Sorrentino, 1995: 32). There may also be overstatement of the extent of underutilisation if a number of unemployed only desire part-time work.

(b) The operational difference between being classified under the ILO guidelines as employed and unemployed is only one hour of paid employment or self-employment.[5] An economy with many part-time workers who desire but cannot find full-time work is arguably less efficient than an economy with labour preferences for work hours satisfied. In this regard, involuntary part-time workers share characteristics with the unemployed. If this form of underemployment is considered, the indicator would "move from an activity-based concept of the labor force … [as in the unemployment rate] … to a 'time lost' type of concept." (Sorrentino, 1995: 32).

(c) Okun (1983: 171) believed that "unemployment was merely the tip of the iceberg that forms in a cold economy." The subterranean underutilisation includes the extra labour participation that occurs in an economic upturn. The cyclical gains in labour force participation are due to the entry of marginal workers into the labour force when the probability of gaining work increases. These workers are often termed hidden unemployed or discouraged workers. From a statistical consideration, the hidden unemployed are classified as being *not in the labour force*. From the perspective of underutilised labour resources, the issue is whether

these people have characteristics similar to those who are classified as being in the labour force but unemployed. A large number of persons defined as not being in the labour force still may have a marginal attachment to it. In Australia, marginally attached are those who want to work and are actively looking for work but not available to start work in the reference week, or those who are not actively looking for work but who are available to start work within four weeks.[6] Discouraged workers are a sub-group of the marginally attached. They want to work and are available for work but believe that search activity is futile given the poor state of the labour market.[7] The discouraged (not in the labour force) worker is thus more like the unemployed (in the labour force) worker than they are, for example, like a retired person or a child in full-time education.

Labour utilisation is maximised if labour underutilisation and underemployment are minimised. While these concepts can underpin a broader and more comprehensive measure of labour utilisation, it remains true that the unemployment rate, as currently defined is, as Sorrentino states (1995: 33), "the most readily available, well-understood, and comparable measure." The OECD standardised unemployment rates are consistent with the ILO guidelines and are widely used to compare the state of labour underutilisation across time, regions, and countries. The standardised unemployment rates published by the OECD cover 24 OECD countries. According to the OECD they are "as close as possible to ILO (and Eurostat) guidelines for international comparisons of labour force statistics" (OECD, 2000). The data are based on household labour force survey data of member countries.

General consensus would exist that a higher standardised unemployment rate is less desirable than a lower rate and many commentators would conclude that a country with higher unemployment rates is not managing the economy as well as another country with a lower rate. However, even assuming the conceptual basis is consistent, comparisons between periods within a country or at a point in time across countries may be misleading because the unemployment rate neglects the factors outlined above.

Figure 1 shows the standardised unemployment rates for Australia and the United States and an average for the 20 OECD countries for which data was available (see Mitchell, 2000a). Australia had the highest average unemployment rate through most

of the 1980s and the 1990s and tracked the OECD average for the entire period. The USA and Australian cycles are highly correlated. Notwithstanding the fall in unemployment in both countries through the 1990s, the Australian rate of unemployment remains nearly 2 percentage points higher. Mitchell (2000a) has argued that the difference in unemployment behaviour between Australia and the USA over this period is largely explained by the performance of public sector employment. In Australia, public sector employment growth was 0.64 per cent per annum on average between 1970 and 1999, compared to the labour force growth of 1.87 per annum. In the USA, the public sector maintained a growth rate (1.6 per cent) roughly proportional to the growth of the labour force (1.8 per cent per annum). In both countries, the private sector maintained a growth rate commensurate with the labour force growth.

Figure 1 Standardised unemployment rates for Australia and the USA, 1970-99
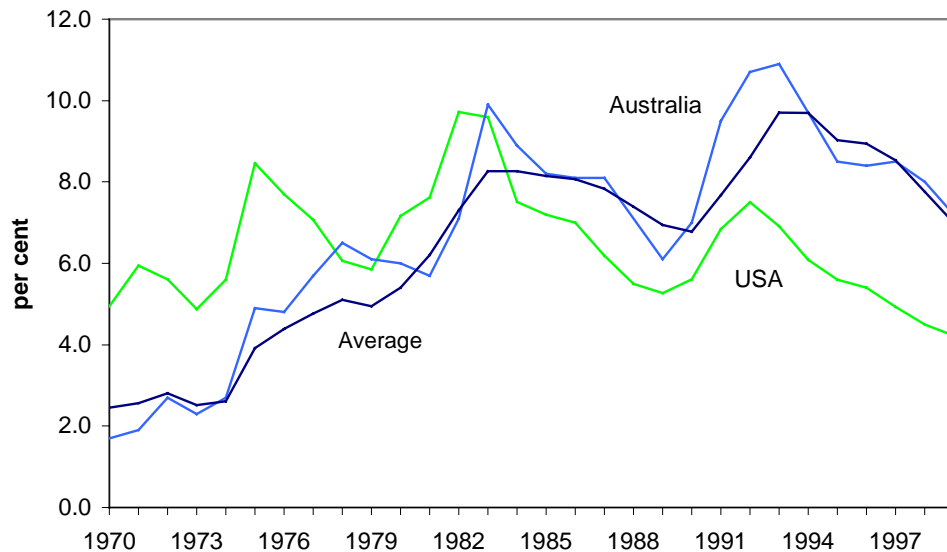
Source: OECD EO data and calculations by Mitchell (2000a). The average is for 20 OECD countries examined in Mitchell (2000a). The data are annual averages of semi-annual data.

The question is whether this comparison of standardised unemployment rates provides a reliable and meaningful indicator of the degree of utilisation of the labour resources in each of the countries depicted. In the next section we consider alternative measures of unemployment, which present a more comprehensive picture of labour market performance.

3. Measure of underemployment and underutilisation for Australia and the USA

A decreasing unemployment rate with more workers making the transition from unemployment to employment may give a falsely optimistic picture of the economy if the number of under-employed part-time workers is rising. In this context, other perspectives could be used in measures of labour utilisation. In this section we compute a range of measures for Australia based on the six BLS indicators (Bregger and Haugen, 1995). We extend the BLS concepts to take into account data variations in Australia compared to the USA. The measures provide a better indication of the extent to which existing and potential labour resources are being under-utilised and therefore, arguably, give a more accurate indication of the degree of tightness in the labour market. At issue is the treatment of various persons working but wanting more hours and persons not counted as in the labour force in the numerator and denominator of the measure. In the official ABS estimates of total unemployment, full-time unemployment and part-time unemployment, the denominator reflects those included in the numerator. For example, the full-time unemployment rate measures the full-time unemployed as a proportion of the full-time unemployed and the full-time employed.

3.1 The BLS U1-U6 Measures in the United States

Starting in 1977, the BLS began regular publication of 7 alternative unemployment measures. In 1994 these were refined to 6 measures, which reflected changes made to the design of survey questionnaires introduced at that time (Bregger and Haugen, 1995). The new indicators U4 to U6 are different from their predecessors. Of particular note is the definition of marginally attached, of which discouraged workers is a sub-category. Marginally attached workers are those who explicitly want a job, are explicitly available for work and have looked sometime in the prior year, but are not currently looking for various reasons. The explicit criteria is important as in the old survey design some of these aspects were inferred from answers to other questions. Discouraged workers are those whose reason for not currently looking is job market-related i.e. they felt their search would be in vain. The U4 measure includes discouraged workers with the unemployed, while the U5 measure includes

all those with marginal attachment to the labour force with the unemployed. Table 1 defines the six BLS measures now in use.

Table 1 The BLS U-1 to U-6 alternative measures of labour underutilisation

Measure	Concepts defining the measure
U-1	Persons unemployed 15 weeks or longer, as a percent of the civilian labor force
U-2	Job losers and persons who completed temporary jobs, as a percent of the civilian labor force
U3	Total unemployed, as a percent of the civilian labor force (official unemployment rate)
U-4	Total unemployed, plus discouraged workers, as a percent of the civilian labor force plus discouraged workers
U-5	Total unemployed, plus discouraged workers, plus all other marginally attached workers, as a percent of the civilian labor force plus all marginally attached workers
U-6	Total unemployed, plus all marginally attached workers, plus total employed part time for economic reasons, as a percent of the civilian labor force plus all marginally attached workers

Source: Bregger J.E and Haugen S.E. (1995).

The most comprehensive measure is U6. It shows all unemployed, plus all marginally attached plus all persons working part-time for economic reasons as a percent of the labour force augmented to include marginally attached workers. This is the most comprehensive of the alternative measures. Bregger and Haugen (1995: 24) see it as "effectively treating workers who are visibly underemployed and all persons who are "marginally attached" to the labor force equally with the unemployed." Since the redesigned survey questionnaire only became available in 1994, these measures are shown in Table 2 from 1994.

Table 2 The BLS U-1 to U-6 alternative measures of labour underutilisation

	U1	U2	U3	U4	U5	U6
1994	2.2	2.9	6.1	6.5	7.4	10.9
1995	1.8	2.6	5.6	5.9	6.7	10.1
1996	1.7	2.5	5.4	5.7	6.5	9.7
1997	1.5	2.2	4.9	5.2	5.9	8.9
1998	1.2	2.1	4.5	4.7	5.4	8.0
1999	1.1	1.9	4.2	4.4	5.0	7.4

Source: BLS data.

The question is whether these extra indicators offer any meaningful additional information about the degree of underutilisation or underemployment in the US labour market. For the indicators of more serious unemployment (U1 and U2) the smaller they are as a percentage of total unemployment the better. The results show that as U3 has fallen, U1 and U2 have also fallen in percentage terms relative to U3, which indicates that the improving labour market provides opportunities for longer-term unemployed and the involuntary unemployed. In this sense, the U1 and U2 measure relative to U3 provides additional and useful information about the dynamics of the labour market. The U4 to U6 measures represent increment broadening of the U3 measure. Table 3 constructs gaps between U4-U3, U5-U4, and U6-U5, which can be interpreted in incremental terms. The U3-U1 and U3-U2 gaps represent narrowing of the definition of unemployment but cannot be interpreted in an incremental manner and are not shown.

Table 3 Deviations in measures of underutilisation and underemployment, USA

	U4-U3	U5-U4	U6-U5
1994	0.4	0.9	3.5
1995	0.3	0.8	3.4
1996	0.3	0.8	3.2
1997	0.3	0.7	3.0
1998	0.2	0.7	2.6
1999	0.2	0.6	2.4

Source: BLS data.

Examining all the gaps, it is clear that they decrease as the economy has improved. This means that the US labour market has provided improved fortunes for all the categories that represent marginal attachments (U4 to U6). The gap between U4 and U3 is due to discouraged workers. The gap indicates that hidden unemployment at the levels of activity prevailing over the entire period examined has been significant (adding 0.4 per cent in 1994). The declining gap is expected and indicates that the labour force participation changes due to cyclical variations in activity are declining. The gap between U5 and U4 is due to the inclusion of all other marginally attached workers (in addition to the discouraged workers included in U4). As discouraged workers, as defined, are only a part of all marginally attached workers, the inclusion of the additional marginally attached workers has a more significant impact on the

degree of underutilisation. Interestingly, the gap U4-U3 was halved over the period (1994 to 1999), while that for U5-U4 declined by a third. This indicates that in the expansionary phase the discouraged workers as a group more readily changed their status than the other marginally attached workers. Gross flows data may be able to shed light on this.

The largest gap is between U6 and U5 (and by definition U6 to U3). That is, the U6 measure includes not only persons defined as *Not in the Labour Force*, but also those employed part-time for economic reasons (underemployed part-time workers). While U4 and U5 indicate underutilisation of willing labour resources, U6 provides information about underemployment of currently employed labour. A larger gap indicates that underemployment of part-time workers is higher. This would mean that the economy fails to provide enough labour hours to satisfy the preferences of the existing labour supply. A falling gap means that the degree of underemployment is declining. The gaps in Table 3 show that underemployment is a more significant source of wasted labour resources than underutilisation. The falling U6-U5 gap shows that the expansion has provided increased working hours to part-timers who were previously constrained. Combined with the falling U5-U4 and U4-U3 gaps, we can conclude that the expansion has decreased both the degree of underutilisation and the degree of underemployment. This supports the major conclusions of Okun's upgrading hypothesis (Okun, 1983).

In conclusion, the measures provide useful additional information about the dynamic adjustments in the US labour market.

3.2   Labour underemployment and underutilisation measures for Australia

Table 4 defines a range of measures for Australia, which are similar to those developed by the BLS and defined in Table 1. They are not strictly comparable because some data restrictions result in certain differences from the BLS measures. For example, we have not calculated U2 since data was not currently available on persons who completed temporary jobs. The differences from BLS measures in the other measures occur in U1 and U6. U1 for Australia refers to unemployed 13 weeks or longer.[8] We have also created two measures for U6 – one which includes all part-time workers who preferred to work more hours and one which includes only those

working part-time who preferred to work more hours and who looked for full-time work.

Table 4 Measures of labour underutilisation and underemployment for Australia

Measure	Concepts defining the measure
U-1	Persons unemployed 13 weeks or longer, as a percent of the civilian labour force
U3	Total unemployed, as a percent of the civilian labour force (official unemployment rate)
U-4	Total unemployed, plus discouraged workers, as a percent of the civilian labour force plus discouraged workers
U-5	Total unemployed, plus discouraged workers, plus all other marginally attached workers, as a percent of the civilian labour force plus all marginally attached workers
U-6a	Total unemployed, plus all marginally attached workers, plus total employed part time who preferred to work more hours, as a percent of the civilian labour force plus all marginally attached workers
U-6b	Total unemployed, plus all marginally attached workers, plus total employed part time who preferred to work more hours and who looked for full-time work, as a percent of the civilian labour force plus all marginally attached workers

Table 5 shows the time series we computed for these alternative measures (see also Figure 2). Due to changes in ABS definitions we have only computed the U5 and U6 measures from 1986. Estimates from September 1986 were based on a revised labour force questionnaire introduced in April 1986. The estimate of employment was expanded resulting in a slight decrease in the estimate of persons not in the labour force (ABS, 1986a). New or amended concepts were also introduced in the September 1983 survey, causing a break in series (see ABS, 1986b). In particular, the availability to start work criteria was not applied to the definition of discouraged jobseekers in surveys prior to September 1983. This meant that prior to this date persons were classified as discouraged jobseekers regardless of whether or not they were available to start work in the near future. Also persons not in the labour force aged 65 and over were added to the September 1983 survey of persons not in the labour force, and may therefore be classified as being discouraged jobseekers or as otherwise having marginal attachment to the labour force from this date. (From 1987, this was modified to include only persons 65-69 in the *not in the labour force survey* estimates, although all persons over 65 continue to be included in the monthly Labour Force Survey estimates).[9] Persons belonging to two other groups were also added starting with the

1983 survey, as marginally attached (but not discouraged) workers: persons who were actively looking for work but who were unable to start in the survey week for reasons other than their own temporary illness or injury; persons who had been away from work without pay for four weeks or longer and had not been actively looking for work, of which those who wanted to work and were available to start work within four weeks are included as having marginal attachment to the labour force.

Table 5 Underutilisation and underemployment measures, Australia, 1981-2000

	U1	U3	U4	U5	U6a	U6b	UFT	UPT
1981	2.9	5.8	6.8				5.7	6.0
1982	3.6	7.2	8.3				7.2	6.9
1983	6.2	9.9	11.5				10.5	7.5
1984	5.7	8.9	10.2				9.3	7.5
1985	5.1	8.3	9.4				8.4	7.5
1986	4.7	8.1	9.2				8.2	7.7
1987	4.8	8.1	9.3				8.3	7.3
1988	4.1	7.2	8.2	14.9	17.9	16.2	7.2	7.3
1989	3.2	6.2	7.0	13.6	16.7	14.8	6.1	6.6
1990	3.6	6.9	8.0	14.5	18.0	15.9	7.0	6.7
1991	5.9	9.6	11.0	17.6	22.0	19.4	10.2	7.6
1992	7.4	10.8	12.3	18.8	24.2	21.2	11.8	7.5
1993	7.4	10.9	12.4	19.4	24.9	21.8	11.8	7.7
1994	6.5	9.7	10.8	17.1	22.5	19.5	10.4	7.6
1995	5.3	8.5	9.6	16.5	21.8	18.9	9.0	6.9
1996	5.1	8.5	9.7	16.6	21.9	18.9	8.9	7.3
1997	5.3	8.6	9.7	16.6	22.2	19.1	9.0	7.2
1998	4.9	7.9	9.1	16.3	21.7	18.6	8.4	6.8
1999	4.2	7.2	8.3	15.2	20.5	17.3	7.4	6.9

U1 = Persons unemployed 13 weeks or longer, as a percent of the civilian labour force
U3 = official unemployment rate
U4 = Total unemployed, plus discouraged workers, as a percent of the civilian labour force plus discouraged workers
U5 = Total unemployed, plus all marginally attached workers, as a percent of the civilian labour force plus marginally attached workers
U6a = U5 plus underemployed part-time (preferred to work more hours).
U6b = U5 + underemployed part-time (preferred to work more hours and looked for full-time work).
UFT = ABS measure - unemployment rate for persons for looking for full-time work.
UPT = ABS measure - unemployment rate persons for looking for part-time work

From Table 6, it is interesting to note that in 1988 and 1999, U3 was equal to 7.2 per cent. Both observations were in a year that followed several years of growth in the economy and an increasingly tighter labour market. Over the same period, U1, U4 and U5 are more or less back to their 1988 levels, but U6a and U6b, the broadest measures, are significantly above their 1988 levels. This would be consistent with a

labour market that has created jobs but not matched the hours on offer to those desired by the incumbents. That is, while utilisation has returned to the levels of 1998, underemployment has worsened. The data in Table 6 also show that as we broaden the measure, the extent of underutilisation and underemployment grows dramatically. Indicator U6a, for example, suggests that around 20 per cent of willing labour resources in 1999 are wasted in some way. The data also suggest that underutilisation and underemployment are greater problems in the Australian labour market that appears to be the case for the USA.[10] On the surface, a wider coverage to reflect marginal workers and underemployed part-timers provides a more comprehensive measure of labour utilisation and raises a series of research questions not suggested by the unemployment rate.

Figure 2 Underutilisation and underemployment measures, Australia, 1981-1999
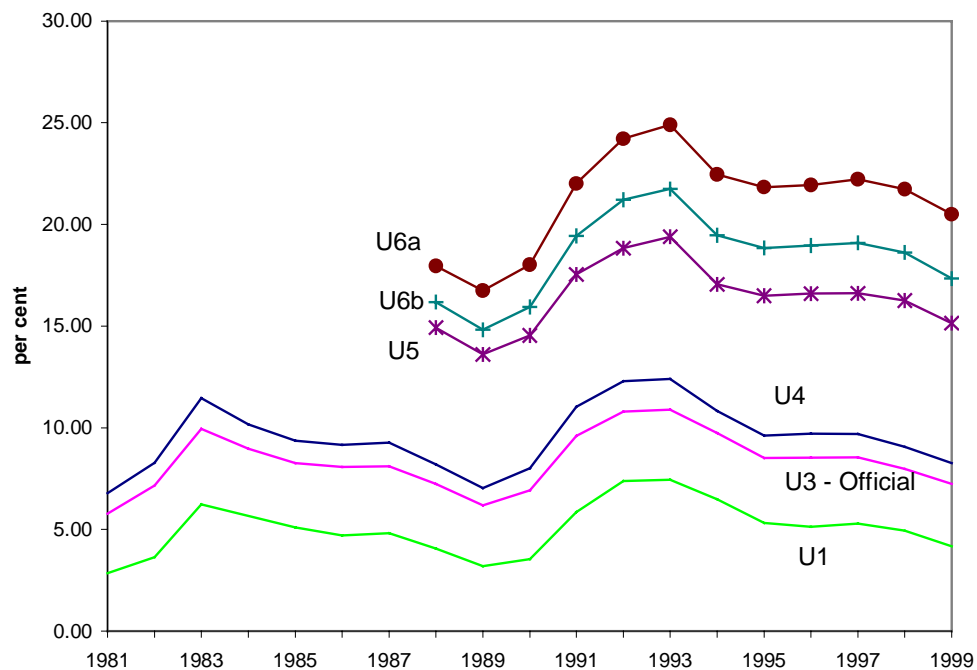
The relationship between U1 and U3 can be examined in percentage terms because they share the same denominator. The numerator of U1 is the unemployed longer than 13 weeks. If U1 rises as a percentage of U3 we conclude that the longer-term unemployed are becoming more significant as a proportion of total unemployment. The data shows that over the period 1981 to 1999 this percentage has moved in a cyclical manner. The 1991-92 recession provided a more severe shock to the longer-

term unemployed than the 1983 recession. Since the last recession (1992) the percentage has fallen from 68.3 per cent to 57.6 per cent. This indicates that the fortunes of this group have improved in relative terms.

The other measures can be interpreted in incremental terms. Table 6 shows the gaps between the various measures in an analogous fashion to the gaps shown in Table 3. The U4-U3, U5-U4, and U6a-U5 and U6b-U5 gaps represent an incremental broadening of the official unemployment rate (U3). Examining all the gaps, it is clear that they exhibit markedly different patterns to those for the USA.

Table 6 Deviations in measures of underutilisation and underemployment, Australia

	U4-U3	U5-U4	U6a-U5	U6b-U5
1988	0.9	6.7	3.0	1.3
1989	0.9	6.6	3.1	1.2
1990	1.1	6.5	3.5	1.4
1991	1.4	6.5	4.5	1.9
1992	1.5	6.5	5.4	2.4
1993	1.5	7.0	5.5	2.4
1994	1.1	6.2	5.4	2.4
1995	1.1	6.9	5.3	2.4
1996	1.2	6.9	5.3	2.4
1997	1.2	6.9	5.6	2.5
1998	1.1	7.2	5.5	2.4
1999	1.0	6.9	5.4	2.2

The gap between U4 and U3 is due to discouraged workers and the results show that this component of underutilisation adds around 1 per cent to the U3 measure. As expected, the gap increased in the recession and declined in the late 1990s growth phase. However, the impact of discouraged workers is not insignificant. The estimates from ABS indicate that around 105 thousand workers are excluded from the labour force under this category. Mitchell (2000b) using different methodology estimates that hidden unemployment was around 180 thousand in 1999. At any rate, the size of the gap indicates that hidden unemployment is a significant wastage of available resources.

The gap between U5 and U4 is due to the inclusion of all other marginally attached workers (in addition to the discouraged workers included in U4). As discouraged workers, as defined, represent only a part of all marginally attached workers, the

inclusion of the additional marginally attached workers has a more significant impact on the degree of underutilisation. The size of this gap is very significant and indicates substantial resource wastage. This is a notable difference to the US behaviour. The dynamic of this series is only mildly cyclical. As in the US case, the closure of the U4-U3 gap was larger than the closure of the U5-U4 gap. This indicates that in the expansionary phase the discouraged workers as a group more readily changed their status than the other marginally attached workers.

The gap between U6a and U5 has grown since 1988 and has not returned to its pre-1991 recession levels. This is in sharp contrast to the results for the US shown in Table 3. The result indicates that despite the aggregate unemployment rate suggesting an improving labour market, the gap between U6a and U5 shows an economy where the relative degree of underemployment among part-time workers is rising. Since 1988, U5 indicates that underemployment has also risen in absolute terms. Further, the impact of underemployment is relatively less important in comparison to marginal attachment in the USA than it is for Australia. Further, the combined effect of hidden unemployment, marginal attachment and underemployment for Australia in 1999 (using U6a) was around 13.1 per cent (or 1.8 times U3) whereas for the US it was around 3.2 per cent in 1999 (or 0.80 times U3).

The gap between U6b and U5 behaves in a similar fashion to the U6a-U5 gap. The conceptual difference between U6a and U6b is that the latter excludes part-time workers who desire more hours but did not search for full-time work. We address this distinction more fully in the next section.

In conclusion, as we broaden the measures, we gain an increasingly disturbing view of the labour market in Australia. The analysis also raises a range of interesting questions about the relative performance of the US and Australian labour markets, which go beyond the insights that the U3 measure alone would provide.

4. Hours-based measures of labour underutilisation for Australia

While the measures developed in Section 3 are useful improvements on the official unemployment rate, they still are limited by the fact that they are variously percentage relationships derived from ratios of persons. A major issue, which arose in Section 3,

concerned which persons should be included in the numerator and denominator of the adjusted unemployment rate. It was concluded that a wider coverage to reflect marginal workers and counts of underemployed part-timers, gave us a more comprehensive measure of labour underutilisation. However, a more sophisticated, and arguably more precise measure of labour underutilisation can be constructed in terms of hours.

In this section, we therefore extend the analysis to compute and include two new measures of underutilisation – hours-based measures of unemployment one with and one without hidden unemployment. We compute and compare the following measures of labour underutilisation (see Appendix for technical explanations):

1. The official unemployment rate – denoted U3 as defined above in Table 4.
2. The official unemployment rate augmented by the hidden unemployment estimates in Mitchell (2000b) (expressed in terms of a percentage ratio with persons on the numerator and denominator) – denoted CU4.[11]
3. An hours-adjusted unemployment rate (expressed in terms of a percentage ratio with hours on the numerator and denominator), being a ratio of unutilised hours of work available (unemployed and underemployed part-time workers) to total the 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) - denoted CU7.
4. An hours-adjusted unemployment rate including estimates of hidden unemployment (expressed in terms of a percentage ratio with hours on the numerator and denominator) – denoted CU8.

Table 7 compares the measures developed with the official unemployment rate, the employment-to-population ratio and the unemployment-vacancy ratio. The employment-population and UV series display clear cyclical patterns. The UV series also demonstrates that the economy has been demand constrained for the entire period. The series indicate considerable differences in the degree of labour utilisation. The difference between U3 and CU4 is due to hidden unemployment (in persons). 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 1992 and 1993). The gap narrows as the economy achieves higher levels of

activity. In 1999, the inclusion of hidden unemployment (counted in persons) adds 1.8 per cent to U3.

Table 7 Different unemployment-based measures of labour utilisation and the employment to population ratio in Australia, 1980-2000

	Official U3	UR + HU CU4	Hours CU7	Hours +HU CU8	NPOP Ratio	UV Ratio
1980	6.1	7.3	7.5	8.2	0.58	10.6
1981	5.8	6.8	7.3	7.9	0.58	9.5
1982	7.2	8.8	9.1	10.4	0.56	15.8
1983	10.0	13.1	13.1	14.9	0.54	21.1
1984	9.0	11.7	11.7	13.2	0.55	13.6
1985	8.3	10.6	10.6	11.9	0.56	9.3
1986	8.1	10.2	10.6	11.8	0.57	9.5
1987	8.1	10.3	10.9	12.1	0.57	9.2
1988	7.2	9.0	9.5	10.5	0.58	7.5
1989	6.2	7.4	8.4	9.0	0.59	6.2
1990	6.9	8.4	9.7	10.7	0.59	10.1
1991	9.6	12.4	13.8	15.3	0.57	26.4
1992	10.8	14.2	16.5	17.9	0.56	28.0
1993	10.9	14.3	16.7	17.9	0.56	22.2
1994	9.7	12.7	14.9	15.9	0.57	12.0
1995	8.5	10.8	13.2	14.0	0.58	10.7
1996	8.5	10.9	13.1	14.2	0.58	10.2
1997	8.5	10.9	13.5	14.2	0.58	9.7
1998	8.0	10.1	12.7	13.3	0.58	7.9
1999	7.2	9.0	11.4	12.0	0.59	7.1
2000 (a)	6.7	8.2	11.0	11.1	0.59	5.9

(a) average for the period from January to August.
U3 is the official unemployment rate published by the ABS.
CU4 is the total unemployment plus hidden unemployment as a percentage of labour force plus hidden unemployment - UR + HU
CU7 is the Hours-adjusted unemployment rate – Hours.
CU8 is the hours-adjusted measure of (3) – Hours + HU.
NPOP = Employment to Population as a percentage (ABS 6302.0).
UV = Unemployment to Vacancy Ratio (ABS 6203.0).

The other two measures (CU7 and CU8) are hours-based indicators of labour utilisation, both of which demonstrate considerable disparity from the person-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 in CU8 the hidden unemployed) 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. It is clear that the both of the hours-adjusted unemployment rates (CU7 and CU8) are substantially higher than the official rate indicating that the extent of underutilisation and underemployment is large. The gap between U3 and CU7 has risen since 1980, which indicates that a proportion of jobs created have been part-time but with less than desired hours on offer. The frustration of workers with less than desired hours of work available is latent in the hidden unemployed as well. The gap between CU7 and CU8 reflects the magnitude of hidden unemployment and the hours-aspirations of the hidden unemployed. 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, the results are consistent with the conclusions reached using the U1-U6b indicators in Table 5. They all indicate substantial labour resource wastage in the Australian labour market. Further, if we aspire to efficient use of our resources then the hours-adjusted measures are better indicators of the degree of slack in the labour market than the other measures in Table 5 or Table 7.

Figure 4 shows the official unemployment rate (U3), the persons-based unemployment rate augmented by hidden unemployment (CU4), and the two hours-adjusted measures of underutilisation and underemployment (CU7 and CU8), which are explained above. It is clear that the waste of labour resources rises in an economic downturn not only because unemployment rises but also because hours of work are rationed and an increased number of workers are unable to work as many hours as they would prefer. The losses are compounded by the falling labour force participation rates captured by the CU4 and CU8. As the economy increases activity, more employed workers find full-time hours of work, the participation rate stabilises at a higher level, and the absolute number of unemployed falls.

The other interesting aspect of the relationship between the series is that while the three series move in a clear cyclical pattern, CU8 leads CU7 and CU4 leads U3. CU8 leads all the other measures. This suggests that the labour participation effects impact sooner than adjustments in hours. An examination of a chart of the percentage changes in each measure (not shown) suggests that percentage changes in CU4 and CU8 generally lead the other two indicators. At top of a cycle, it appears that

participation effects come more quickly than any hours-adjustment. More research is needed in this area.

Figure 4 U3, CU4, CU7, and CU8, Australia, 1980-2000.
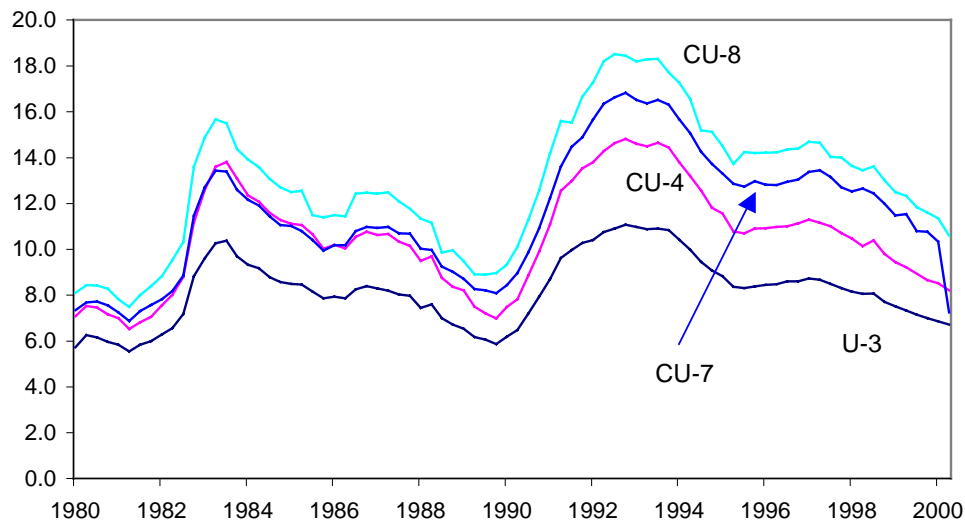
U3 = Official unemployment rate
CU4 = Official plus hidden
CU7 = Hours-adjusted official rate
CU8 = Hours-adjusted plus hidden

Table 8 provides summary statistics (mean, variance, and coefficient of variation) for U3 and the three CU indicators in level form and quarterly percentage change form. The results show that as expected the mean and variance of the levels increase as the measure becomes more comprehensive. The most comprehensive measure (CU8) varies due to changes in persons-unemployed, hours of work, preferences for hours worked, and the cyclical sensitivity of the labour force participation rate.

Table 8 Summary statistics for U3, CU4, CU7 and CU8, 1980-2000.

	Levels			Percentage Changes		
	Mean	Variance	CV (%)	Mean	Variance	CV (%)
U3	8.2	2.4	18.9	0.61	83.2	1499.8
CU4	10.5	5.4	22.1	0.72	111.2	1456.5
CU7	11.4	7.2	23.6	0.68	54.5	1078.2
CU8	12.8	8.7	22.9	0.74	70.4	1128.2

Table 9 shows the correlation between the measures of labour utilisation shown in Table 7. The correlations show that the employment-to-population ratio is more strongly correlated with the person-based estimates of the unemployment rate

(including the hidden unemployment augmentations) than it is with the hours-based measure. This means that the employment-to-population ratio, while providing a clearer indication of employment (persons) trends than measures deflated by the labour force, will overestimate the health of the labour market. The hours-based measures provide a clearer picture of the resources wasted by the lack of activity in the economy.

Table 9 Correlations between measures of labour utilisation in Australia, 1980-1999

Measure	U3	CU4	CU7	CU8	NPOP	UV
U3	1.000					
CU4	1.000	1.000				
CU7	0.931	0.926	1.000			
CU8	0.969	0.965	0.991	1.000		
NPOP	-0.664	-0.673	-0.380	-0.482	1.000	
UV	0.753	0.741	0.617	0.686	-0.649	1.000

Table 10 shows the correlations between the annual percentage changes in the measures of labour utilisation and Gross Domestic Product (GDP). The interesting point here is that changes in the employment-population ratio and GDP changes are more highly correlated with the hours-based measures (CU7 and CU8) than they are with the person-based measures.

Table 10 Correlations between percentage changes in various measures of activity, Australia, 1981-2000

Measure	U3	CU4	CU7	CU8	NPOP	UV	GDP
U3	1.000						
CU4	0.999	1.000					
CU7	0.994	0.992	1.000				
CU8	0.994	0.991	0.991	1.000			
NPOP	-0.931	-0.929	-0.935	-0.933	1.000		
UV	0.837	0.826	0.827	0.855	-0.745	1.000	
GDP	-0.899	-0.892	-0.904	-0.912	0.810	-0.851	1.000

(a) average for the period from January to August. For GDP, the 2000 growth rate was measured as the percentage change between the June quarter 1999 to June quarter 2000.

Table 11 shows regression results based on a simple dynamic model, first discussed in this context by Okun (1983: 148). The dependent variable is the unemployment gap

for each measure, which was constructed by smoothing the series with a Hodrick-Prescott filter and subtracting the smoothed series from the actual. This provides one method of constructing a deviation-from-trend time series. The independent variable was the percentage change in GDP. The regressions tested 4 lags of the change in GDP. The preferred regression in each case included only the first lag. There was very little evidence of a contemporaneous effect. All the equations that tested for contemporaneity were poorly specified. The results are interesting and reveal sharply different cyclical sensitivities. For each extra one percent of GDP, the deviation of U3 from its trend is 0.10 points lower. Analogously, the deviation of CU4 from its trend is 0.15 points lower, the deviation of CU7 from its trend is 0.16 points lower, and the deviation of CU8 from its trend is 0.18 points lower. The results suggest that the economy gains from higher levels of activity not only in terms of less unemployment, but also through increased average working hours, and higher participation rates. Given that the difference between U3 and CU4 is solely in terms of the estimated hidden unemployed, the coefficient on CU4 (-0.1523) indicates a strong labour force participation effect. More research is needed in this area.

Table 11 Unemployment measure regressions, Australia, 1980 (3) to 2000 (1)

	U3	CU4	CU7	CU8
Constant	0.54	0.77	1.14	1.58
	(1.94)	(1.84)	(2.70)	(3.24)
DGDP_1	-0.1017	-0.1512	-0.1561	-0.1772
	(4.19)	(4.17)	(4.26)	(4.17)
R^2	0.33	0.31	0.27	0.28

t-statistics in parentheses.

6.   Conclusion

This paper is the first of a series of research reports based on a comparative analysis of labour market performance in the United States, Japan, and Australia. In this paper we have computed a range of measures of underutilisation and underemployment for Australia using BLS concepts and compared them to similar measures for the US economy. The conclusion is that they provide a richer picture of the state of the labour market than would have been gained if we relied on the unemployment rate as our sole measure. 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. In 1999, around 20 per cent of willing labor resources were in various states of underutilisation or underemployment. This represents a much bleaker picture of the labour market than demonstrated by the aggregate unemployment rate.

The paper also reports for the first time several new indicators of labour market utilisation, which provide a more accurate guide to the state of resource usage than the conventional unemployment rate. The hours-adjusted measures with updated hidden unemployment estimates provide the most comprehensive indicator of labour utilisation. According to the CU8 measure (hours adjusted plus hidden) 12 per cent of willing labour resources measured in hours were being wasted compared to the conventional unemployment rate measure of 7.2 per cent.

Appendix

Derivation of Hours-adjusted unemployment rates

There are two hours-adjusted measures of the unemployment rate presented in this paper:

1) Hours-adjusted unemployment rate (CU7)
2) Hours-adjusted unemployment rate with hidden unemployment (CU8).

The hidden unemployment estimates are taken from Mitchell (2000b). Both measures are designed to capture underutilisation and underemployment that is not measured by the official aggregate unemployment rate or person-based derivatives:

1) CU7 estimates the impact of underemployment of part-time workers, who want to work more hours than they are currently working.
2) CU8 is equal to CU7 plus an estimate (in hours) of the unused resources currently not counted in the labour force but still willing to work – the so-called hidden unemployed.

Hours-adjusted unemployment rate

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

$$(1) \qquad CU7 = \frac{PTE_{UH} + UN_{FT} + UN_{PT}}{FTE + PTE_{H} + PTE_{UH} + UN_{FT} + UN_{PT}}$$

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. The numerator and denominator of CU7 are expressed in hours and the resulting measure 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 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. For the workers in the 0 hours per week category, we treated them as if they were in the 1-15 band. The latter assumption provides some downward bias in the measure. The sum of these individual products is the total hours of part-time workers who are content with the number of hours they are working. These part-time 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 as above) 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 then summed. The workers in the 0 hours band are treated as before. This generates the second component of underemployed part-time work in hours.

The total underemployment of part-time workers 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 is equal to the total persons in this category times the average weekly full-time hours. For those who are currently unemployed but want part-time work, their underutilised hours are computed by multiplying the number of unemployed in this category by the average part-time hours worked. This gives total unemployment in hours

Computing FTE

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

Hours-adjusted unemployment rate with hidden unemployment

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

$$(2) \qquad CU8 = \frac{PTE_{UH} + UN_{FT} + UN_{PT} + HU_{FT} + HU_{PT}}{FTE + PTE_H + PTE_{UH} + UN_{FT} + UN_{PT} + HU_{FT} + HU_{PT}}$$

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 allocated the estimated hidden unemployed between the two categories.

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Endnotes

[1] The authors are, in order of naming, Professor of Economics and Director of the Centre of Full Employment and Equity and Senior Research Officer, Centre of Full Employment and Equity, University of Newcastle, NSW 2308 Australia. We asknowledge helpful input from Martin Watts and John Burgess.

[2] OECD, Standardised Unemployment Rates, published in each issue of *Quarterly Labour Force Statistics*; BLS, "Unemployment rates approximating US Concepts", Foreign Labor Statistics Program, http://www.bls.gov/flshome.htm; ILO, ILO Program of "Comparable Annual Employment and Unemployment Estimates", Bureau of Statistics of the ILO (STAT) www.ilo.org/public/english/bureau/stat/wedo.htm; Statistical Office of the European Communities (EUROSTAT), Harmonised Unemployment rates, www.europa.eu.int/comm/eurostat.

3"The foreign country data are adjusted as closely as possible to U.S. concepts, with the exception of age limits and the treatment of layoffs, for which no adjustments are made. In addition, for some countries, no adjustment is made for deviations from U.S. concepts in the treatment of unpaid family workers, persons waiting to start a new job, and passive job seekers (for example, persons only reading newspaper ads as their method of job search). In the United States, job search must be "active," such as placing or answering advertisements, and simply reading ads is not enough to qualify as active search." (BLS, "Unemployment rates approximating US Concepts", Foreign Labor Statistics Program, ftp://ftp.bls.gov/pub/special.requests/ForeignLabor/flsjec.txt).

[4] We ignore the concept of underemployment based on skill mismatch. Further work is being done to generate a measure matching the skills of the labour supply to the jobs being performed. Clearly, if the society invests resources in education then the skills developed should be used appropriately.

[5] In the Resolution concerning statistics of the economically active population, employment, unemployment and underemployment, adopted by the Thirteenth International Conference of Labour Statisticians (ILO, 1982), the "employed" comprise all persons above a specific age who during a specified brief period, either one week or one day, were in (a) "paid employment" - either "at work" which refers to persons who during the reference period performed some work for wage or salary, in cash or in kind; or "with a job but not at work" temporarily during the reference period, and (b) in "self-employment" either "at work" which refers to persons who during the reference period performed some work for profit or family gain, in cash or in kind; or "with an enterprise but not at work" temporarily during the reference period. Point 2 of the Resolution states: "For operational purposes, the notion "some work" may be interpreted as work for at least one hour." For paid employment this is the definition adopted by both the US and Australia. Point 5 of the Resolution states: "Unpaid family workers at work should be considered as in self-employment irrespective of the number of hours worked during the reference period." Australia has adopted one hour of work for unpaid family workers to be counted as employed, while the US includes only those unpaid family workers who have worked more than 15 hours in the reference week.

[6] The strict definitions vary between countries. Concerning availability, in Australia persons must be available in the next four weeks, in the US they must be available for work in the same week.

[7] In the US survey, discouraged workers are persons not in the labour force who want a job and are available for a job and who have looked for work sometime in the past 12 months (or since the end of their last job if they held one within the past 12 months), but are not currently looking because they believe: there are no jobs available for them; that they could not find work; that they lack the necessary schooling, skills or experience; or they perceive some type of discrimination in the workplace. (BLS, 2000; Castillo, 1998) In Australia persons are classified as discouraged jobseekers if they want to work, are available for work in the next four weeks but are not actively looking for work (have not looked in the last 4 weeks) for one of the following reasons: considered too young or too old by employers; lacked necessary training, skills or experience; difficulties with language or ethnic background; no jobs in locality or line of work; or believe there are "no jobs at all". (ABS, 1999). The main difference is the criteria of must have looked in the past year being applied in the US. This criterion is intended to measure a more formal attachment to the labour market. With the introduction of this criteria and a direct question to measure availability in the US surveys in 1994, the number of discouraged workers fell by roughly one half. (Castillo, 1998).

[8] There is an issue of inconsistency in the BLS measures. In the incremental measures the extra category of underutilisation or underemployment is added to both the denominator and numerator of the measure. However, in the U1 and U2 measures the total civilian labour force is used as the denominator despite narrowing the scope of the numerator (to be a subset of the total unemployed). For Australia, we computed U1 using the BLS method, which is the series presented in the paper. We also

tested the sensitivity of the U1 measure by including only those unemployed 13 weeks or longer in the denominator to correspond with the numerator. The two series were very similar.

[9]The difference between the estimates appearing in the ABS publication 6220.0 Persons Not in the Labour Force and the publication 6203.0 Labour Force, Australia are "chiefly the result of excluding persons aged 70 years and over from estimates appearing in th[e] supplementary survey publication [6220.0]. This is in line with the scope of this supplementary survey. [In 1999] Over one-quarter (32%) of the civilian population aged 15 years and over who were not in the labour force were excluded from answering questions from this supplementary survey because they were aged 70 years and over." (ABS,1999:34) It should also be noted that the Not in the Labour Force survey "excludes persons in institutions (e.g. boarding schools, hospitals, prisons, retirement homes, homes for the handicapped), which are included in estimates of persons not in the labour force contained in Labour Force, Australia [6203.0]." (ABS,1999:34).

[10]This is the case when comparing, for example, US U6 and Aus U6b. Some differences may remain however, in the measures. For example, the US U6 measure includes those employed part-time "for economic reasons" as a measure of underemployment in the numerator. "Economic reasons include slack work or unfavorable business conditions, inability to find full-time work, and seasonal declines in demand. Those who usually work part time must also indicate that they want and are available to work full time to be classified as on part time for economic reasons." (BLS, 2000). The AUS U6b measure we have computed includes part-timers who wanted to work more hours and who had looked for full-time work - that is it approximates the US definition of wanting and being available to work full-time. We believe that our U6a and U6b measures are pertinent in the Australian context, particularly given the enormous growth in part-time employment. For purposes of cross-country comparisons, however, work is continuing on the further standardisation of these measures.

[11]The CU prefix in the measures shown in Table 7 denote CofFEE Unemployment and refers to the comparative indicators developed by the Centre of Full Employment and Equity.