

Hidden Unemployment in Selected OECD Countries

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Abstract

This paper utilises OECD bi-annual data from the Economic Outlook database to estimate the extent of hidden unemployment in selected OECD countries. The labour force variations attributable to an economy operating at below full employment level are computed using a regression modelling framework to generate estimates of the cyclical variations in labour force participation rates. The results show that hidden unemployment is a major problem in the countries studied, and adds to the waste of labour resources that accompany persistent output gaps in OECD countries.

1. Introduction

Most studies of unemployment are motivated by the desire to understand how economic conditions affect unemployment. The equilibrium theory of unemployment determination, in the context of the Phillips curve framework developed by Friedman (1966) and Phelps (1968), offers an interesting approach to establishing the determinants of unemployment. Since the mid-1950s there has been renewed interest and research on the relationship between labour market adjustment and the business cycle (see Reder, 1955; Wachter, 1970; Okun, 1973; and Vroman, 1977). Using different methodologies, these studies have provided a basis for a theory of cyclical upgrading, whereby disadvantaged groups in the economy achieve upward mobility due to higher economic activity (Mitchell, 2000).

In the last two decades, unemployment has widened in almost all OECD countries (OECD, 2001). In the 1980s and 1990s, high and persistent unemployment rates in most OECD countries comprised one of the main global economic problems (Mitchell, 2000). The OECD Jobs Study of 1994 revealed that a large number of persons are not measured as unemployed because they have stopped looking for work (as they do not expect to find it) or because they have settled for a part-time job although they would prefer to work full-time (Britton, 1997). A basic difficulty in determining the reasons for unemployment is how to measure discouraged workers. For the most part, the existing literature overlooks the hidden unemployed. The analysis of hidden unemployment is therefore central to any discussion of unemployment in OECD countries.

The official unemployment rate is an incomplete and increasingly irrelevant measure of the health of labour markets (Barrett, 2002). Barrett (2002) summarises the main reasons why the official unemployment rate should be considered thus:

1. The significant increase in the number of persons who are hidden unemployed.
2. The major shift in the structure of the labour market from full-time to part-time employment.
3. The highly aggregated nature of unemployment statistics, which masks important differences between regions and social groups.
4. The significant increases in the proportion of the labour market who are employed in non-standard forms of employment.

5. The failure of the official unemployment rate to account for variations in the quantity and quality of employment that is available.

Similar trends are observed in other OECD countries, where shifts are occurring in the labour market towards temporary employment and in the labour market mix (OECD, 1996 and 2000).

Few studies have examined hidden unemployment. In an influential article, Perry (1971) examined labour force structure, potential output and productivity between 1948 and 1969 in the United States. Perry estimated the level of hidden unemployment in the United States and concluded that a reduction in hidden unemployment could stimulate growth in labour productivity, and consequently increase total output of the US economy. Although the overall hidden unemployment literature is limited, some recent research has focused on US and Australian labour markets.

Stricker and Sheehan's 1981 examination of Australian labour market found that for the 374,000 persons unemployed in Australia in August 1979, there were an additional 337,000 hidden unemployed, raising the total level of unemployment to 709,000. Stricker and Sheehan concluded that the official unemployment rates were cushioned by the net withdrawal from the labour force of some 340,000 hidden unemployed. In a simulation analysis, Wooden (1996) confirmed the existence of a significant number of hidden unemployed and underemployed in Australia. He argues that in the presence of underemployment and hidden unemployment, sustained growth is unlikely to lead to reductions in the unemployment rate of a similar magnitude. Wooden concludes that the level of output growth is critical in determining how rapidly unemployment can be brought down. Mitchell (2000) extended the model developed by Mitchell *et al.* (1995) to estimate hidden unemployment for Australia and United States. He found comparable estimates of cyclical behaviour in the labour force participation rates of demographic groups, and the level of hidden unemployment in the two countries.

In recent times, economic globalisation (in developed and developing countries) has given rise to a number of interrelated concerns about its social repercussions. As Ghose (2000) notes, trade liberalisation has been driving globalisation, and this has raised three main concerns. First, it is argued that trade liberalisation is a major factor contributing to growing international economic inequality. Second, trade liberalisation is argued to have had serious adverse effects on the employment and wages of low-skilled workers in industrialised countries, leading to deterioration in global labour standards. Third, and highly contested, is the argument that the economic crisis of the 1990s was due to trade liberalisation. Proponents of trade liberalisation argue that the crisis was due to the erratic behaviour of short-term capital inflows. Additional concerns relate to the impacts of liberalisation on employment, the distribution of income, and the role of labour standards (Lee, 1997), and the short and long run negative impact on the wages and financial well being of workers (Houle and Audenrode, 1995). OECD countries differ widely in their level of measured unemployment. This is principally due to differences in definition and in the techniques used to compute unemployment (de Neubourg, 1988). This suggests that traditional measures of unemployment, which ignore those who have stopped looking for work, may provide somewhat misleading inferences as to the level of unemployment within OECD countries. This paper draws on the definition of hidden unemployment used by Stricker and Sheehan (1981). According to this definition, the hidden unemployed are "those persons who are not now in the labour force but who would be in the labour force if the conditions characteristic of full employment existed" (Stricker and Sheehan, 1981: 3).

This exploratory paper is part of a longer-term project, which will develop an econometric model to examine the determinants of hidden unemployment in OECD countries. It is a precursor for a study, which will simulate the effect of changing economic conditions on regional unemployment in the same countries. The remainder of this paper will be organised as follows. Section 2 describes the methodological framework and the OECD bi-annual data for

the period 1980 to 2001, used to make empirical estimates of hidden unemployment. Section 3 reports and discusses the empirical results. Section 4 presents some concluding comments and suggestions for future research.

The model

The theoretical framework developed by Perry (1971) and utilised by Mitchell (2000), is used to derive hidden unemployment in OECD countries. This is a useful model as it provides a representation of the movements in unemployment in terms of secular and cyclical filters (Mitchell, 2000). Following Mitchell (2000), the labour force participation rate is given by:

$$LFPR_t = \beta_0 + \beta_1 LFPR_{t-1} + \beta_2 NPOP_t + \beta_3 T + \varepsilon_t \quad (1)$$

where LFPR is the ratio of the labour force to total civilian population aged 15 to 64 years; NPOP is the ratio of total employment to total civilian population aged 15 to 64 years; T is a linear time-trend in which T equals 1 in the first bi-annual period of 1980 and rises by 1 every six months; ε is a stochastic error term; t is a dating subscript and β s are parameters to be estimated.

The lag of the dependent variable is included on the right-hand-side of equation (1) in order to introduce dynamics into the labour force participation rate model. The incorporation of the time trend variable in the labour force participation equation captures the impact of factors affecting the potential labour force when the economy is at full employment level (Perry, 1971). The participation gap, which is the difference between the employment-to-population ratio at the potential (full) and actual levels of employment in a given year is derived by adjusting the difference between the actual and potential weighted employment rates by the degree of cyclical sensitivity of the labour participation rate measured as $\beta^* = \beta_2 / 1 - \beta_1$ (from equation 1).

The participation gap can thus be expressed as:

$$PRGAP_t = \beta^* (NPOP_t^{FN} - NPOP_t) \quad (2)$$

where PRGAP is the participation gap; $NPOP_t^{FN}$ and $NPOP_t$ are the employment-population ratio at full and actual employment levels, respectively, β is the coefficient that measures the degree of cyclical sensitivity of labour force participation, and t is the dating subscript.

Hidden unemployment (H) is given by:

$$H_t = PRGAP_t \cdot (CIVPOP_t) \quad (3)$$

where CIVPOP is the civilian population.

Deriving the participation gap requires that we obtain an estimate of the full-employment-to-population ratio. The approach used in this paper follows Mitchell (2000). Consider a potential labour force, denoted by L^* with the actual labour force and hidden unemployment denoted by L and H, respectively. The full employment labour force can now be expressed as:

$$L^* = L + H \quad (4)$$

Using N^* and N to represent the employment-to-population ratio at full and actual employment levels, respectively, and substituting (2) into (4) yields:

$$L^* = L + \beta^* N^* - \beta^* N \quad (5)$$

If we now define the target full employment unemployment rate x as:

$$x = \left(1 - \frac{N^*}{L^*}\right) \quad (6)$$

then, substituting (6) into (5) and rearranging gives:

$$N^* = \left(\frac{(1-x)(L - \beta^* N)}{1 - \beta^*(1-x)}\right) \quad (7)$$

where N^* is the employment-to- population ratio at full employment level (i.e. $NPOP^{FN}$).

To determine the level of hidden unemployment for selected OECD countries, equation (1) was estimated using bi-annual data on the civilian population between 15 and 64 years, labour force participation, total employment and the unemployment rate, all obtained from the OECD Economic Outlook Statistics and Projections series for the first six months of 1980 through to the second six months of 2001 (OECD, 2002). Some OECD countries have missing information or estimates yielded inconsistent results, and were therefore excluded from the final estimation. In all, 11 OECD countries were included in the final estimation. The analysis assumed a full employment unemployment rate of two per cent for all OECD countries. The use of aggregate bi-annual data, despite its appeal, has a major weakness. The aggregation of data masks structural shifts occurring in the OECD labour force. Recent trends suggest massive shifts to temporary employment, a general increase in youth unemployment and women in the labour force (OECD 2002). The empirical estimates obtained from the labour force participation rate models are now reported and discussed.

2. Estimation procedures and results

The equations of the labour force participation rate models were estimated for 11 OECD countries using the autocorrelation procedure of the SHAZAM (Version 8.0) econometric package. The results are reported in Table 1. The choice of OECD countries was based on the consistency of the estimated parameters with *a priori* expectations. With the exception of Canada, the United States, the United Kingdom and Finland, the coefficients of the trend variable are statistically significant at a 10 per cent level and exhibit an upward trend. The labour force participation rate for Sweden trended downwards at the rate of 0.01 percent per annum. Overall, the growth in the labour force participation rate is very small, estimated to be less than 0.07 percent a year across the countries studied. An interesting feature of the results is that the coefficients of the time trend variable, although positive and statistically significant at the 5 per cent level, are very small in magnitude. This suggests that the response of the total labour force participation rates to changes in the business cycle and employment rates have been very minor, although significant, during a period of dramatic policy change in selected OECD labour markets.

Table 1 also reports the cyclical responsiveness of the labour force participation rate to a 1 percentage point change in the employment rate. The estimated parameters of cyclical responsiveness are positive and less than 1 in the long run. That is, a rise of 1 percentage point in the actual employment rate would cause a less than proportionate increase in the labour participation rate. The results indicate that a rise of 1 percentage point in employment rate causes labour force participation rates to rise by 0.35, 0.47, 0.63 and 0.54 per cent in Australia, New Zealand, Canada and United States, respectively. For France, a 1 percentage point increase in the employment rate causes a 0.44 percentage rise in the labour force participation rate. The cyclical responsiveness of labour force participation in the UK, The Netherlands, Spain, Finland, Sweden and Korea is estimated at 0.61, 0.30, 0.37, 0.59 and 0.68, respectively.

Table 2 reports the average of recorded and adjusted unemployment rates for the period 1980-2001. For the 11 countries studied, the estimates indicate that, on average, the adjusted unemployment rate exceeds the recorded unemployment rate by about 3.6 percent. Canada (9.2 per cent) has the highest difference between the recorded and adjusted unemployment rate, while Korea (2 per cent) has the lowest difference.

Table 1: Labour participation rates in selected OECD countries

Coefficient	Australia	New Zealand	Canada	United States	France	United Kingdom
β_0	0.341 (5.10)	0.329 (8.15)	0.078 (2.59)	0.077 (1.89)	0.053 (2.26)	0.402 (4.92)
β_1	0.167 (1.57)	0.041 (0.53)	0.760 (13.89)	0.768 (8.99)	0.851 (13.63)	0.248 (2.01)
β_2	0.353 (6.36)	0.471 (11.60)	0.152 (4.45)	0.125 (3.26)	0.066 (1.92)	0.224 (4.61)
β_3	0.0007 (3.22)	0.0002 (2.66)	-0.000 (-0.05)	-0.000 (-0.03)	0.0002 (5.94)	0.0002 (1.05)
R^2 -adj.	0.99	0.97	0.97	0.98	0.98	0.96
s.e.	0.0021	0.0018	0.0027	0.0016	0.0014	0.0020
	Netherlands	Spain	Finland	Sweden	Korea	
β_0	0.051 (2.93)	0.282 (5.32)	0.294 (5.78)	0.191 (6.16)	0.130 (3.01)	
β_1	0.766 (12.60)	0.342 (2.97)	0.397 (4.28)	0.460 (7.99)	0.333 (3.45)	
β_2	0.143 (3.58)	0.200 (5.00)	0.224 (6.12)	0.318 (9.45)	0.453 (6.43)	
β_3	0.0003 (3.45)	0.0006 (5.94)	0.0001 (1.02)	-0.0001 (-1.74)	0.0003 (2.18)	
R^2 -adj.	1.00	0.99	0.99	0.99	0.99	
s.e.	0.0015	0.0020	0.0016	0.0026	0.0030	

Note: Values in parentheses are t-ratios.

Table 2: Unemployment rate, adjusted unemployment rate and hidden unemployment rate for selected OECD countries (per cent, average), 1980-2001

Period	Variable	Country										
		<i>Australia</i>	<i>New Zealand</i>	<i>Canada</i>	<i>United States</i>	<i>France</i>	<i>United Kingdom</i>	<i>Netherlands</i>	<i>Spain</i>	<i>Finland</i>	<i>Sweden</i>	<i>Korea</i>
1980-2001	UR	7.9	6.1	9.2	6.3	10.0	8.4	6.5	18.1	8.5	4.3	3.5
	AUR	10.2	8.4	18.4	9.6	14.2	10.5	10.5	22.4	11.3	7.1	5.5
	HUR	2.3	2.3	9.2	3.3	4.2	2.1	4.0	4.3	2.8	2.8	2.0

Note: UR denotes unemployment rate; AUR denotes adjusted unemployment rate; and HUR denotes hidden unemployment rate.

Sources: UR obtained from OECD database; AUR and HUR calculated by author.

Figures 1 through 11 depict the trend in recorded and adjusted unemployment rates for 11 OECD countries. Figures 1 and 2 plot the time pattern of hidden unemployment and unemployment rates in Australia and New Zealand, respectively. For Australia, the general trend in hidden unemployment and unemployment rates shows pronounced sensitivity to the business cycle, which worsens, in relation to unemployment, when the economy is in a downturn. The lack of cyclical responsiveness of hidden unemployment in the early 1980s suggests the misuse of available human resources (OECD, 1988). The removal of constraints on labour markets through wage moderation in the late 1980s appears to have dampened inflationary pressures and contributed to the recovery of the Australian economy (OECD, 1988). The subsequent expansion created a significant number of new jobs (UN, 2000) and, as a consequence, there has been a decrease in the level of unemployment and hidden unemployment in the late 1990s. For New Zealand, the cyclical asymmetry is more pronounced and the relationship between hidden unemployment and unemployment rate appear to have widened following the very bad recession of the early 1990s (Figure 2). The recession seems to have increased the sensitivity of the labour force to cyclical downturns, partly because it led to a number of previously stable jobs being shed and replaced by more instrumental, secondary sector positions. The New Zealand Government's policy of reducing benefits to the unemployed, implemented in the mid 1980s, exacerbated the labour problems, and created huge social costs. The Employment Contracts Act of the early 1990s caused the creation of more unstable, low wage positions. The effect was to gradually increase the level of unemployment, and possibly hidden unemployment in New Zealand in the 1990s.

Figures 3 and 4 show the time pattern of recorded and adjusted unemployment rates for Canada and the United States, respectively. The high and persistent levels of hidden unemployment in the early 1980s and 1990s in these two countries may be due, in part, to the polarisation of work, which resulted in a widening income distribution and the consequent marginalisation of the unemployed, increase in poverty and exacerbation of budgetary pressures on existing social safety nets (OECD, 1996). In the US, the rise in the levels of unemployment and hidden unemployment in the early 1980s and 1990s may be due to recessions. The cyclical asymmetry is less obvious in the case of the US, for the two troughs shown, although the general cyclical pattern is evident. The general decline in hidden unemployment in the mid and late 1990s was primarily due to output growth both in the United States and Canada.

Figure 5 shows that the level of the hidden unemployment rate in Korea has generally been driven by the business cycle. Hidden unemployment declined in the 1980s and early 1990s, rose quite dramatically between 1996 and 1997 (the period of the financial crisis), and then declined

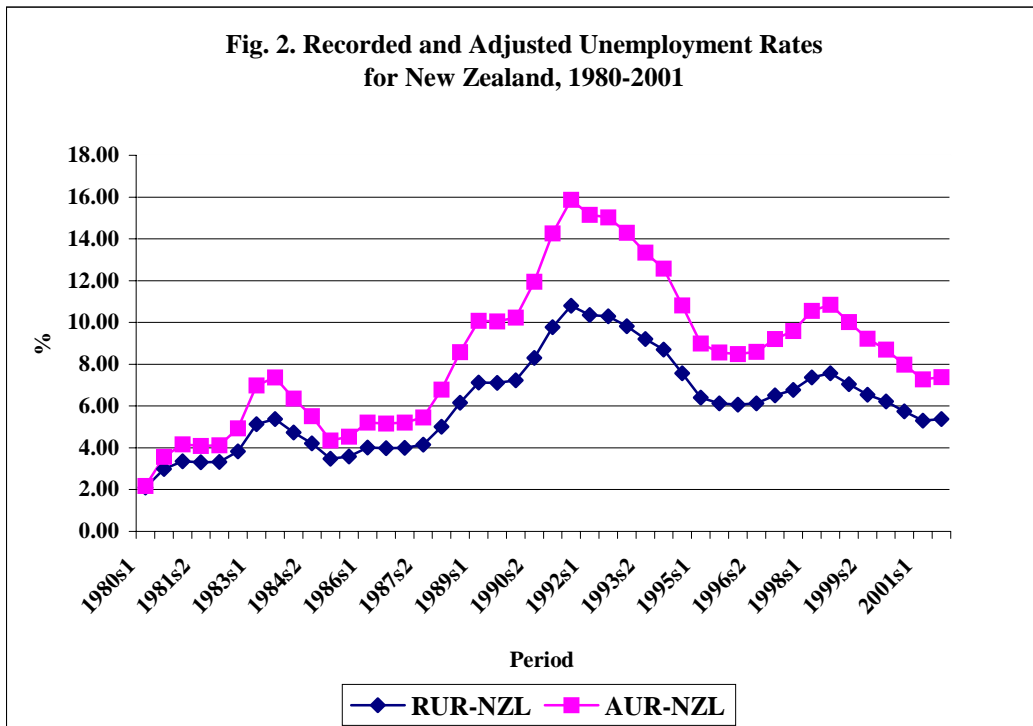
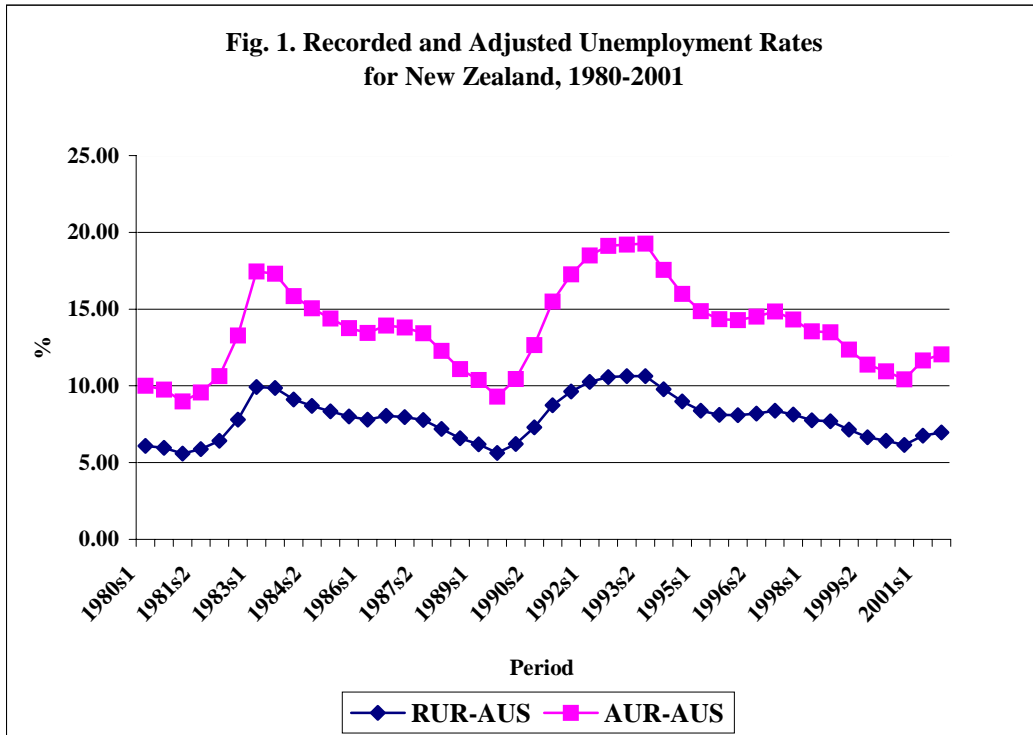
in 1998 and 1999. There was a further decline in 2000, but a slight increase in 2001 and the first-six months of 2002, reflecting asymmetry between unemployment and hidden unemployment. The experience of the 1990s in Korea suggests that economic growth has large benefits to idle labour outside of the labour force but a downturn generates very sharp labour force exit behaviour.

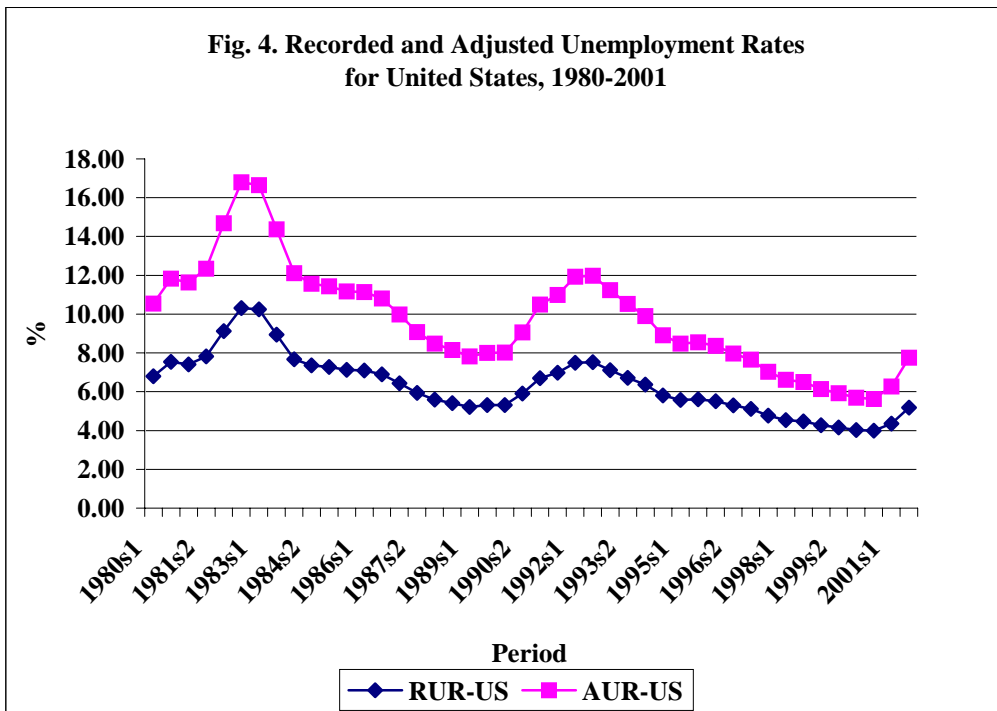
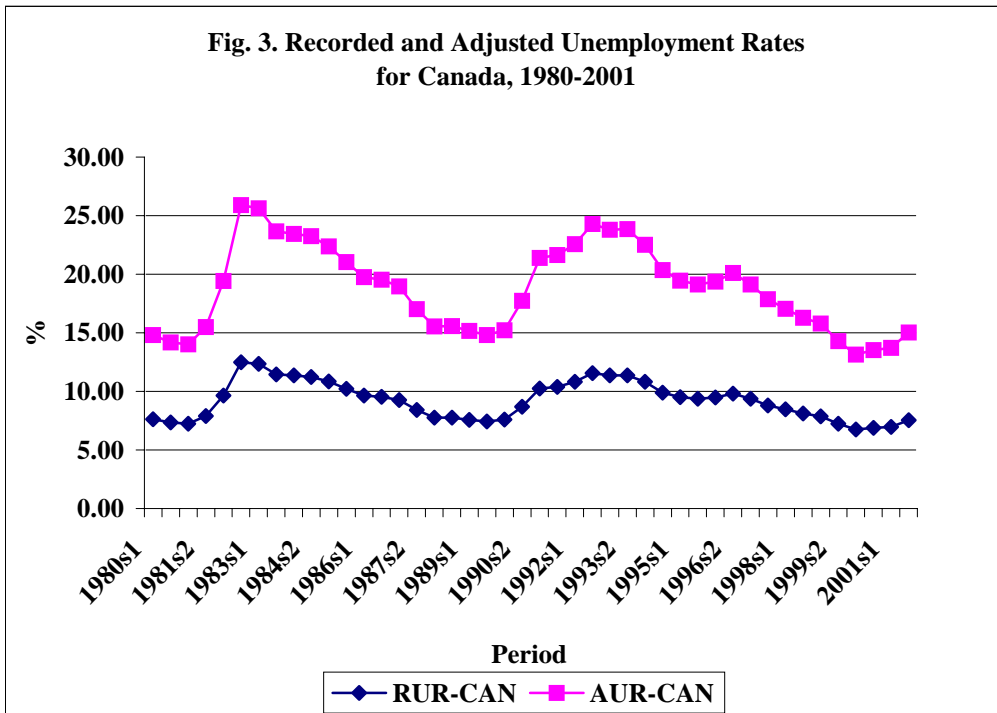
Figures 6 to 11 show the time pattern of recorded and adjustment unemployment in France, the United Kingdom, The Netherlands, Spain, Finland, and Sweden, respectively. Trends in hidden unemployment appear to differ quite considerably across selected European countries. France is notable for the proportional response of unemployment and hidden unemployment to changes in the level of economic activity (Figure 6). Exports provided a strong impetus to economic growth in France in the late 1990s. The depreciation of the French currency against the US dollar, coupled with a steady improvement in consumer confidence, produced a higher rate of capital utilisation and lower inventory levels (UN, 2000). As a result, there was a general decrease in the level of hidden unemployment and unemployment in France during the study period. Similarly, in the United Kingdom, labour underutilisation dominates hidden unemployment. Hidden unemployment in the United Kingdom broadly behaves in a symmetric counter-cyclical fashion (Figure 7). Results for The Netherlands show a pronounced cyclical responsiveness of the labour force to the two recoveries of the mid-1980s and mid-1990s (Figure 8). The increase in hidden unemployment and unemployment in The Netherlands in the early 1990s could be due to the massive increase in the number of persons on disability pensions who no longer have to be counted as in the labour force to receive benefits. The low level of hidden unemployment in The Netherlands could be attributable to tightened administrative controls on job search and the reduced tax on the benefits of low-wage workers, or to new hires of the long-term unemployed that have stimulated employment growth.

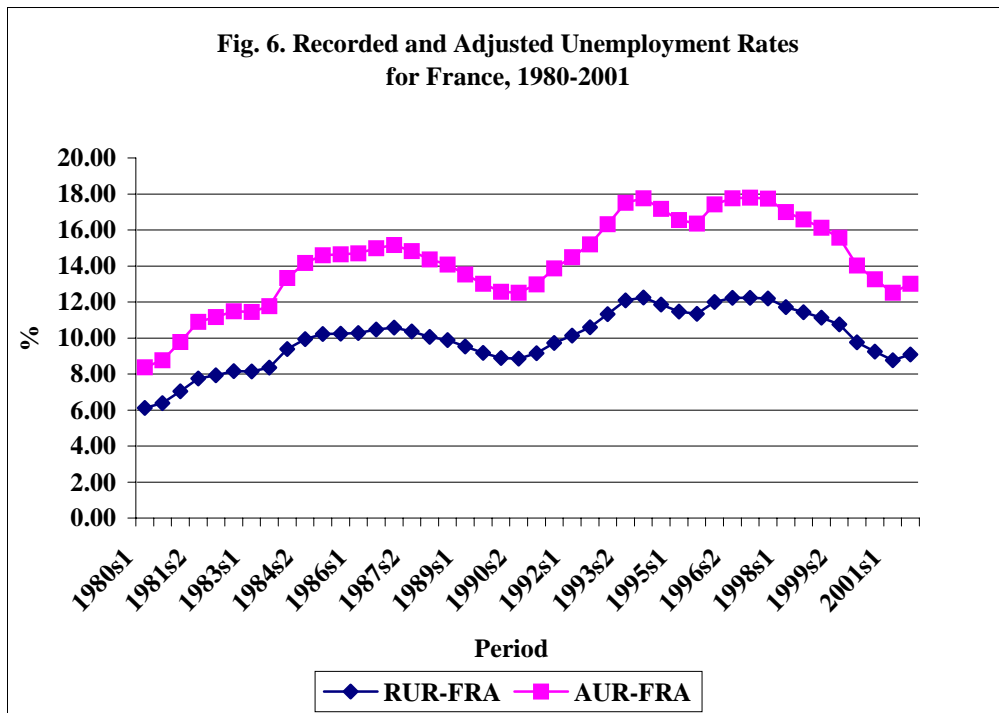
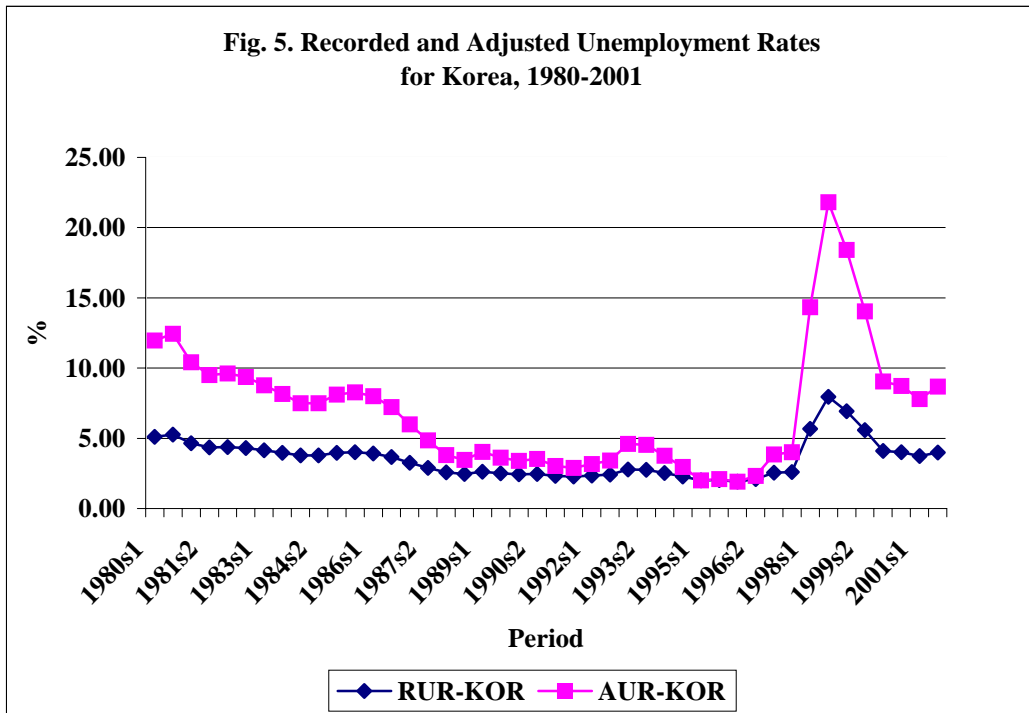
In Finland (Figure 9), the high levels of hidden unemployment in the early 1990s were primarily due to the very deep recession in 1991. The Finnish economy had previously maintained full employment following the OPEC oil shocks in the mid to late 1970s. It is clear that the 1991 experience generated significant cyclical sensitivity in Finland's labour force. The trend towards part-time service sector employment also dominates the Finnish economy. Consequently, the hidden unemployment-to-unemployment ratio in Finland has been more or less proportional over the expansion of the 1990s. Unemployment, however, remains very high relative to other OECD nations.

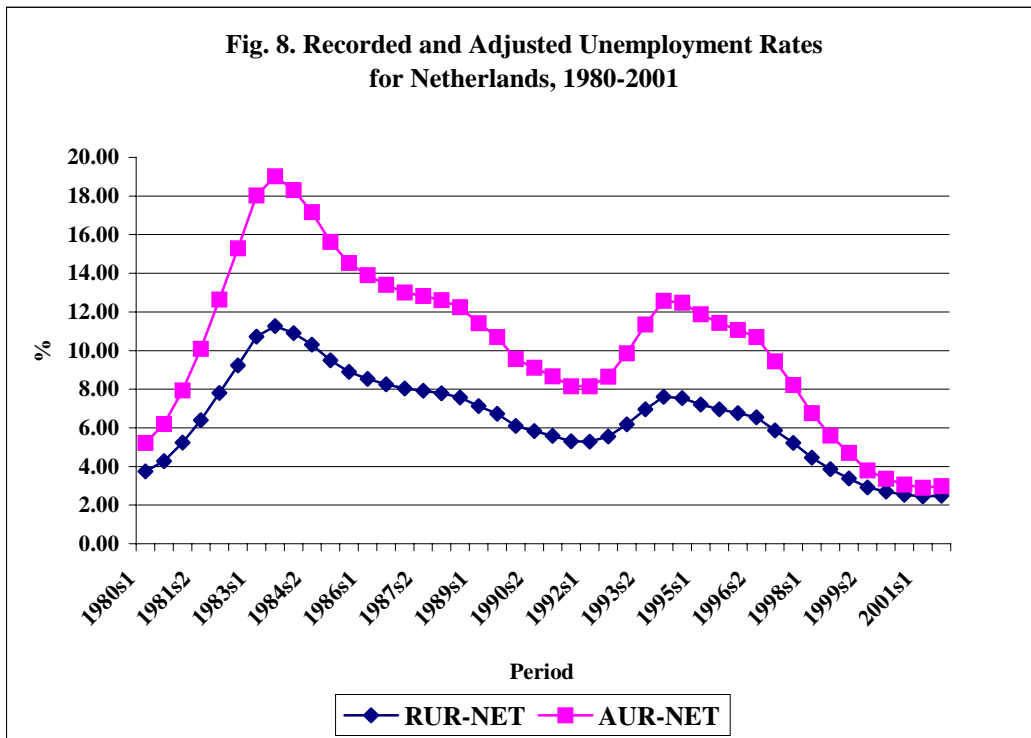
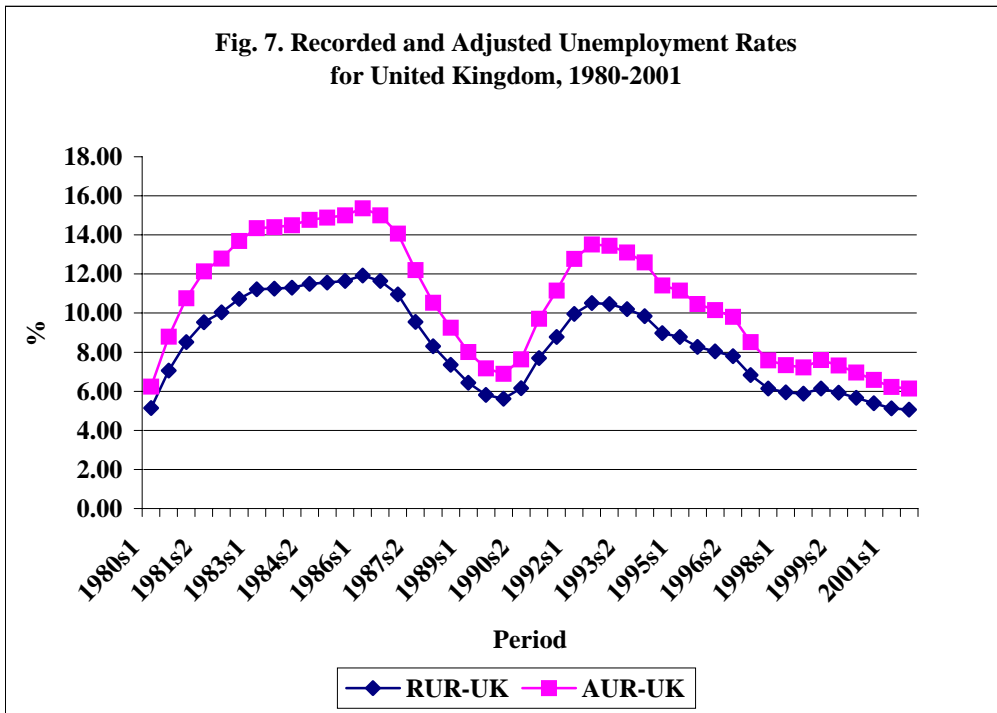
In Spain (Figure 10), hidden unemployment is less important than official unemployment. The latter is very high in relative terms. There is little asymmetry in Spain's hidden unemployment-to-unemployment ratio. The explanation may lie in the behaviour of the benefits system. The Spanish Government liberalised the regulation of temporary contracts in the mid-1980s, resulting in a reduction in the level of hidden unemployment and unemployment. Sweden (Figure 11) operated at near full employment until the big recession of 1991. This was followed by a change in government policy towards active labour market programs, driven by the need to meet the Maastricht fiscal stabilisation criteria, and demand deficiency throughout the 1990s. The moderate cuts in benefits to the unemployed in the mid-1990s appear to have lowered the level of hidden unemployment and unemployment in Sweden in the late 1990s.

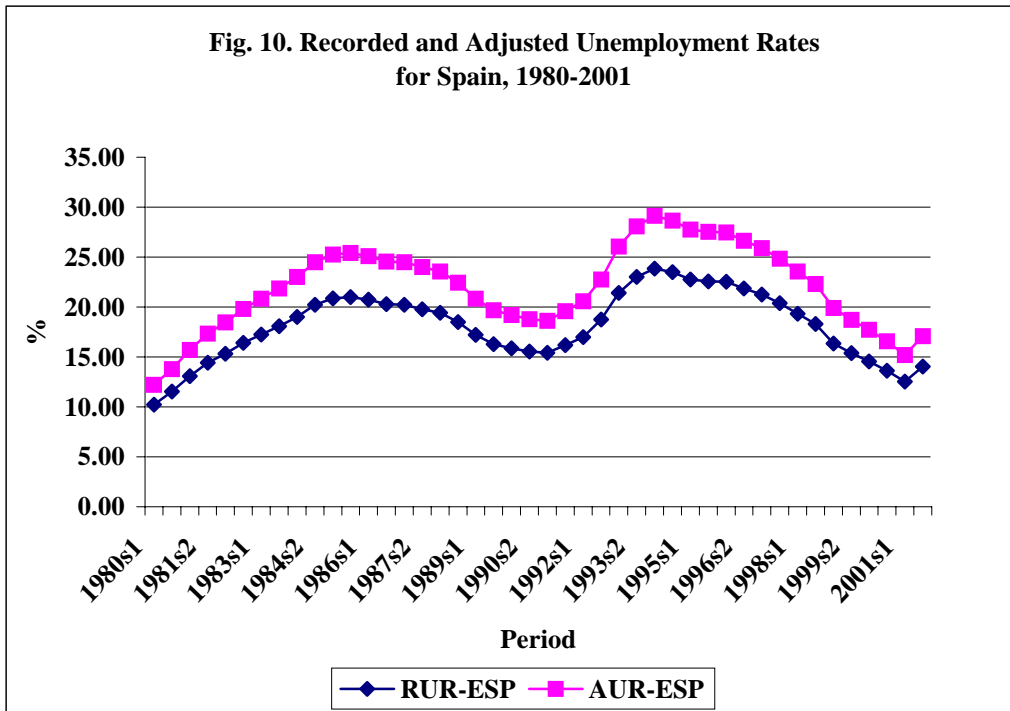
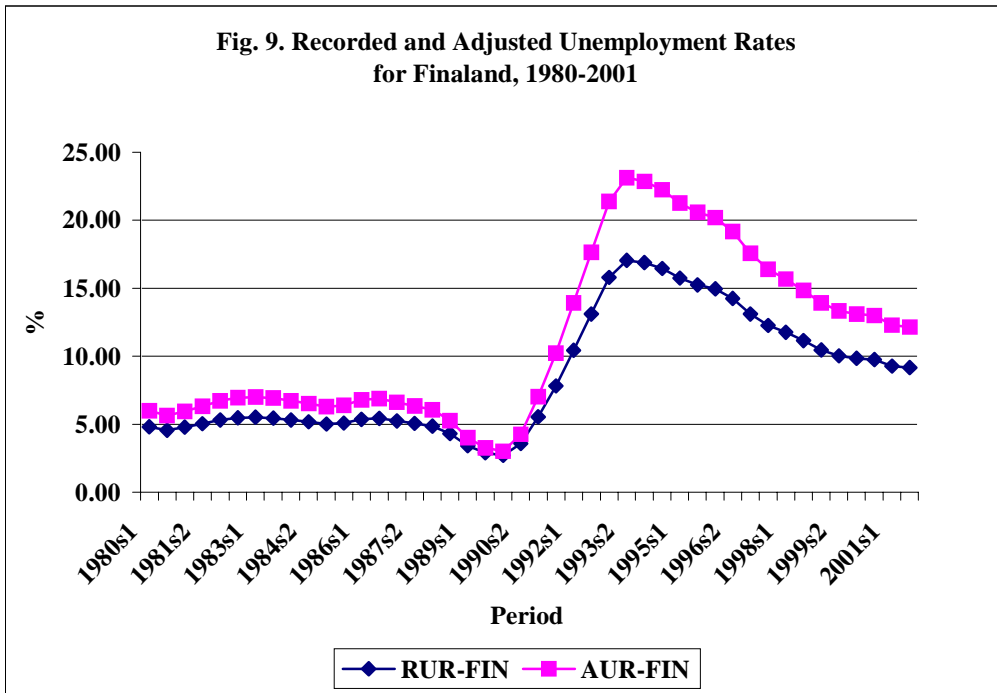
Figures 1 to 11: Recorded unemployment rate (RUR) and adjusted unemployment rate (AUR) for selected OECD countries, 1980-2001

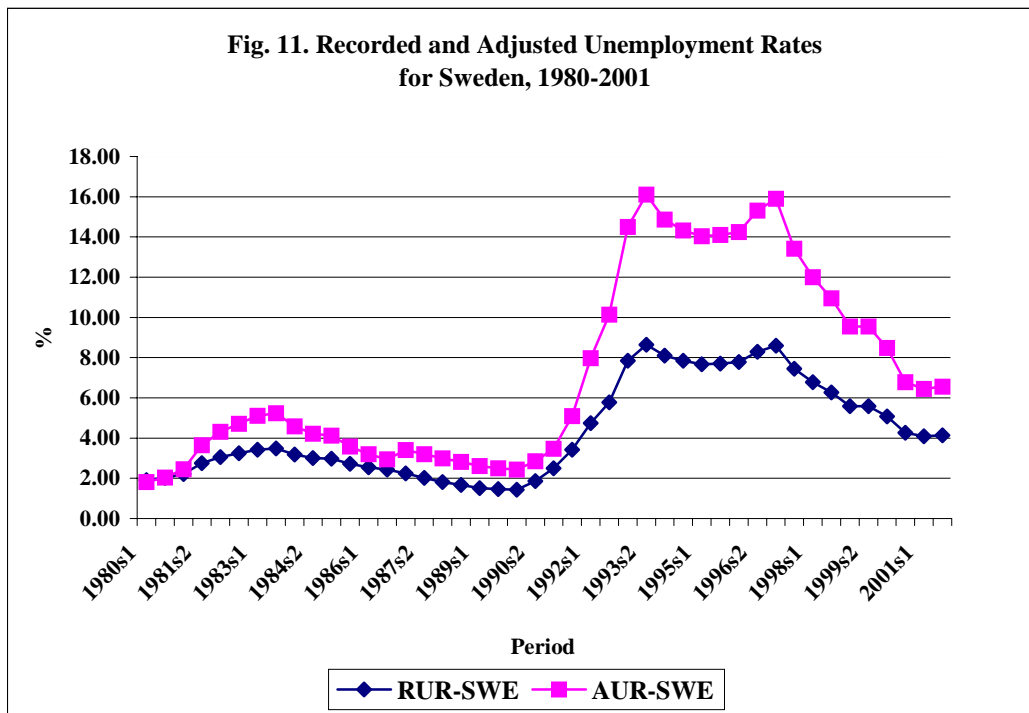












3. Conclusion

The purpose of this study has been to estimate hidden unemployment in selected OECD countries. The findings indicate that large differences exist in the level of hidden unemployment across the countries studied. It may be tentatively concluded that the cyclical asymmetry between hidden unemployment and unemployment can be explained by economic growth and labour policy reforms in OECD countries, which have been key factors in reshaping labour markets. The outcomes of this study tend to support the view that official unemployment rates typically underestimate unemployment. This implies that traditional measures of unemployment, which ignore hidden unemployment, may provide somewhat misleading inferences regarding the level of unemployment in OECD countries. It is thus recommended that hidden unemployment be incorporated into the measurement of unemployment. Identifying and quantifying the key determinants of hidden unemployment in the OECD is a priority for future work. Future research will also attempt to disaggregate data by age to improve our understanding of labour market dynamics in OECD countries.

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Comment on ‘Hidden Unemployment in OECD Countries’

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Agbola’s paper presents estimates of the magnitude by which unemployment is understated in official labour market statistics for 11 OECD countries. The problem of measuring the actual underemployment of the labour force is approached in an aggregate, exploratory framework. One interesting outcome of the work is that it is possible to construct reasonably comparable time series of hidden unemployment for a cross-section of countries, small and large, distributed over four continents. Another interesting aspect is the interpretation of the estimated time series and patterns of hidden unemployment in their proper regional and historical context. The paper represents a courageous attempt at providing concrete answers to complex questions that relate to the functioning of labour markets under a wide variety of institutional and economic conditions. The use of the OECD Economic and Employment Outlook statistics for 11 countries illustrates how the application of an existing macro-economic model to a multi-country data set can create ‘added value’.

The procedure used to estimate the size of hidden unemployment may be described in three steps:

1. A calibrating relationship between observed participation rates and employment rates is estimated. This relationship is specified to capture secular shifts in participation rates through a deterministic trend term, and more stochastic or cyclical movements through an autoregressive term and an employment-to-population ratio. A measure of the “cyclical sensitivity” of labour force participation is derived as the long-run coefficient of the employment-population ratios in the calibrating relationship.
2. Proportionality is assumed between the participation gap and the employment gap. Specifically, the participation gap is calculated by multiplying the estimated cyclical sensitivity with the difference between full and actual employment as a proportion of the civilian population of working age. At this exploratory stage of the research, the full-employment or “target” employment rate is set at a uniform rate of 98 per cent for all countries (allowing for 2 per cent frictional unemployment).
3. The calculated participation gap is applied to the civilian population of working age so as to convert it into a figure for hidden unemployment. Official unemployment rates are adjusted for this ignored component and the augmented unemployment series are summarised, graphed and discussed.

During the workshop, the author expressed his awareness of some possibilities for refining this procedure in subsequent work. With respect to the first step, some attention may be paid to the statistical acceptability of the calibrating specification. Admittedly, the empirical model is meant to be descriptive rather than structural. Nevertheless, it is legitimate to ask how solid the significance tests are, and how statistically stable the implied relationships. They might be quite solid and stable, but at this stage of the research the matter does not seem to have been examined. Furthermore, the empirical scope of the study is voluntarily limited to those countries for which the estimation outcomes suggest consistency with the underlying theoretical description. However, by selecting only those countries showing “consistency of the estimated parameters to *a priori* expectations”, Agbola makes it difficult to count the selected results as evidence in support of the underlying theory and its parameterisation.

With respect to the second step, one would like to get an idea of how sensitive the results are to the choice of the uniform 2 per cent full-employment unemployment rate. The level of hidden unemployment is a function of this “target” unemployment rate, multiplied by the estimated

“cyclical sensitivity” of the participation rate. Therefore it would seem easy to vary the absolute numbers of hidden unemployment by choosing another “target” unemployment rate. In addition, this variation would not be neutral in comparative terms since the estimated “cyclical sensitivity” varies across countries. How important is the implied arbitrariness?

Finally, with respect to the third step, it may be possible to evaluate the precision of the hidden unemployment figures, by presenting (some kind of) prediction intervals rather than just estimated values.

On a more economic note, Bill Mitchell noted during the workshop that labour market indicators are not independent of the institutional environment. The incentive and measurement systems differ across countries and change over time, and may have a pervading impact on the figures. This observation invites further comparative multi-country research at a more institutional level. Other remarks made at the conference expressed a vivid interest in a disaggregation of the labour market based on sex, age and educational differences. It seems beyond doubt that the consideration of more homogeneous labour market segments in their proper institutional setting would allow even more meaningful international comparisons.