Centre of Full Employment and Equity

Long-term unemployment – the effectiveness of training programs

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Abstract

The major labour market role of government over the last 20 years has been to provide a plethora of training schemes, many of them targeted at the problem of long-term unemployment (defined as a spell of unemployment longer than 52 weeks). These have been at the expense of direct job creation programs. The aim has been to restore employability to the long-term unemployed. This short paper provides some evidence of the success of this strategy.

Previous work by Chapman *et al.* (1992) and EPAC (1996) found that a rising proportion of long-term unemployed (PLTU) was not a separate problem from that of the general rise in unemployment. So policies should aim to cut the aggregate unemployment rate. This downplays the importance of targetted training programs. Yet, the major labour market emphasis since the 1980s has been on training programs and if the targetted assistance had have been working a structural break in the relationship between PLTU and the unemployment rate should be detected, especially in the late 1990s. This becomes a testable hypothesis in a regression framework. If such a break is not detected then it is plausible to conclude that the targetted training programs have not been as effective in reducing the proportion of long-term unemployed as decreasing overall unemployment by the provision of more jobs.

Our method also provides a framework to appraise the hysteresis hypothesis advanced by Mitchell (1987). Carlin and Soskice (1990) express this hypothesis in terms of the relationship between the long-term unemployment rate and the aggregate unemployment rate. For the hypothesis to be valid, the PLTU and the actual unemployment rate should be cointegrated. We generate results that provide support for the second requirement.

The paper is set out as follows. Section 2 presents the summary data and graphical analysis. Section 3, outlines the regression methodology and presents the results. The implications of the results are also examined. Concluding remarks follow.

1 Introduction

The major labour market role of government over the last 20 years has been to provide a plethora of training schemes, many of them targeted at the problem of long-term unemployment (defined as a spell of unemployment longer than 52 weeks). These have been at the expense of direct job creation programs. The aim has been to restore employability to the long-term unemployed. This short paper provides some evidence of the success of this strategy.

Previous work by Chapman *et al.* (1992) and EPAC (1996) found that the proportion of long-term unemployment (PLTU) was cointegrated with the unemployment rate and that an error-correction depiction of the dynamics of the proportion of long-term unemployment was highly significant. The conclusion that drawn was that "Overall, these results suggest that rising PLTU in recent times is not fundamentally a separate problem from that of the general rise in unemployment. Hence policies to reduce the overall unemployment rate will have favourable effects in reducing PLTU, although a supplementary role for labour market programs in training and retraining may not be ruled out." (EPAC, 1996: 131). Although they failed to establish a break in the relationship between PLTU and the unemployment rate in the 1990s, EPAC (1996: 131) concluded "it may be too early to draw conclusions about the effectiveness of such programs as the implementation of Working Nation programs commenced in late 1994."

The major labour market emphasis since the 1980s has been on training programs and if the targetted assistance had have been working a structural break in the relationship between PLTU and the unemployment rate should be detected, especially in the late 1990s. This becomes a testable hypothesis in a regression framework. By extending the sample used, the work of Chapman *et al* (1992) and EPAC (1996) can test the hypothesis that a structural break occurred between PLTU and the unemployment rate. If such a break is not detected then it is plausible to conclude that the targetted training programs have not been as effective in reducing the proportion of long-term unemployed as decreasing overall unemployment by the provision of more jobs.

Our method also provides a framework to appraise the hysteresis hypothesis. Mitchell (1987) outlined an early version of the hysteresis hypothesis, in an effort to refute the

theoretical consistency of the natural rate of unemployment (and NAIRU) methodology. The major hypothesis concerned the effects of the business cycle on skill levels within the labour force. It was argued that when unemployment rises, the difference between the actual excess labour supply (captured by the unemployment) and the effective labour supply (in terms of wage bargaining pressure) rises because a proportion of the unemployed experience skill atrophy and cease to be a threat to the jobs of the employed workers. As the economy runs at higher pressure, the wedge decreases as firms lower their hiring standards and offer job-specific training to unemployed workers. The dynamics is these labour market adjustments underpin a cyclically-sensitive steady-state unemployment rate. Mitchell (1987) established the empirical plausibility of this approach. Various other theoretical explanations have been advanced since by a number of authors to explain the same phenomenon. Each one renders the natural rate conception invalid.

This proposition is closely linked the version of the hysteresis hypothesis that is expressed in terms of the relationship between the long-term unemployment rate and the aggregate unemployment rate. Carlin and Soskice (1990: 452) outline two related hypotheses that should hold for the hysteresis hypothesis to be valid: (a) The first requires that the unemployment rate be less effective in its negative influence on wage outcomes, the larger is the proportion of long-term unemployment, and (b) that the proportion of long-term unemployment and the actual unemployment rate be cointegrated. We generate results that provide support for the second requirement.

The paper is set out as follows. Section 2 presents the summary data and graphical analysis. Section 3, outlines the regression methodology and presents the results. The implications of the results are also examined. Concluding remarks follow.

2 The Data

Table 1 shows the official unemployment rate (UR), the total unemployment (UN), the total long-term unemployed (LTU), and the proportion of long-term unemployed in total unemployment (PLTU). Over the period examined, the official unemployment rate has almost returned to the level it started from. So while unemployment level (in thousands) has on trend been proportional to labour force growth (but still very high),

long-term unemployment rate has gone from just over 1 per cent in 1978 to around 1.9 per cent in 1999. The result has been that the proportion of long-term unemployed in total unemployment has nearly doubled. Figure 1 shows that the unemployment rate and the proportion of long-term unemployment move closely together over the cycle. As the unemployment rate falls, the proportion of the remaining unemployed who are classified as long-term unemployed falls. However, the data clearly shows that this relationship is not one-for-one.

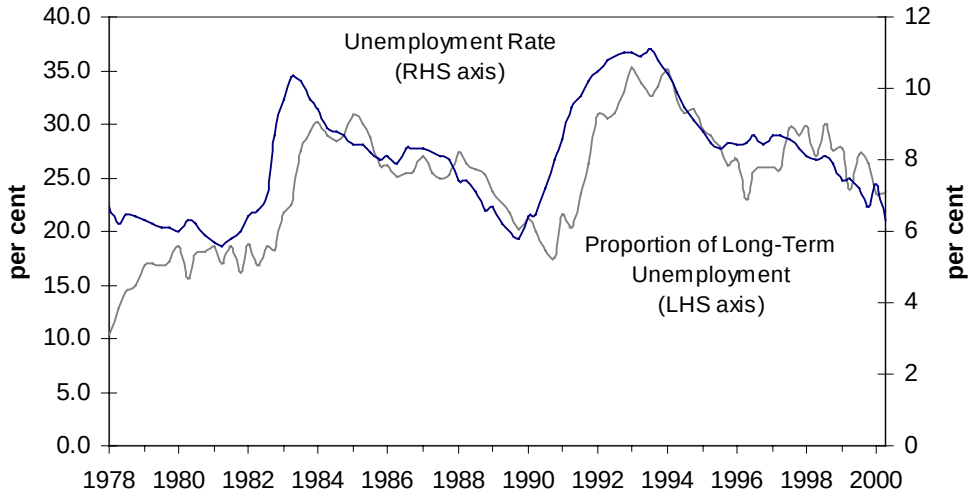
So in the current expansion, the unemployment rate has fallen by 4.2 per cent from its previous peak during the 1991-92 recession and this has been associated with a proportionately smaller decline in the number of long-term unemployed.

Table 1 Unemployment and long-term unemployment, Australia, 1978-2000

	UR	UN	LTU	PLTU
	Per cent	000's	000's	Per cent
1978	6.5	412.0	54.0	13.1
1979	6.2	399.7	67.8	16.9
1980	6.1	405.1	71.0	17.5
1981	5.8	391.2	68.8	17.6
1982	7.2	493.2	89.5	18.1
1983	10.0	695.5	175.8	25.3
1984	9.0	636.6	185.5	29.1
1985	8.3	600.4	174.3	29.0
1986	8.2	615.4	157.5	25.6
1987	8.2	630.1	161.5	25.6
1988	7.1	568.4	149.0	26.2
1989	6.2	508.7	112.5	22.1
1990	7.0	593.7	113.5	19.2
1991	9.5	809.6	186.5	22.9
1992	10.8	923.2	289.5	31.3
1993	11.0	944.2	319.0	33.8
1994	9.7	851.8	277.0	32.5
1995	8.5	770.6	216.3	28.1
1996	8.5	776.0	196.3	25.3
1997	8.6	792.3	218.5	27.6
1998	8.0	749.0	214.0	28.6
1999	7.2	680.6	179.0	26.3
2000	6.8	654.4	154.0	23.5

Source: ABS, *The Labour Force, Australia*, 6203.0.
2000 observations are based on monthly data to August.

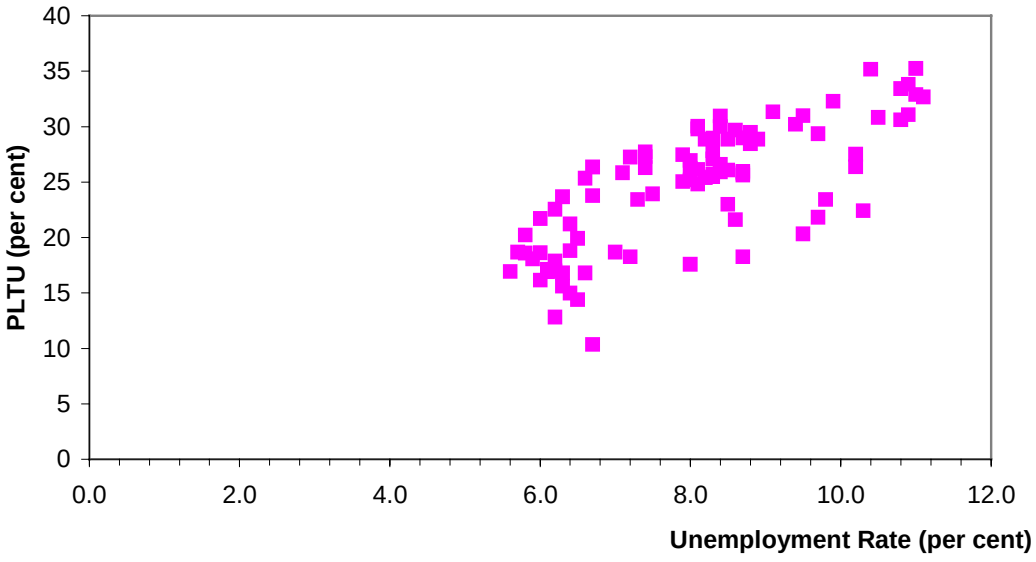
Figure 1 Unemployment rate and proportion of long-term unemployed, Australia



Source: ABS, The Labour Force, Australia, 6203.0

Figure 2 shows the relationship between the aggregate unemployment rate and the proportion of long-term unemployment in total unemployment. The relationship appears to be highly positive (correlation coefficient is 0.82) and.

Figure 2 The Proportion of Long-term Unemployment and the Unemployment Rate (March 1978-June 2000)



Source: ABS, The Labour Force, Australia, 6203.0

3 Testing methodology and results

It is common to test for unit roots in the time-series before commencing formal econometric modelling to establish the presence and order of integration in the time-series. However, in the case of a bounded variable like PLTU or UR, such analysis clearly has problems. By definition, a bounded variable cannot possess an infinite variance and therefore does not satisfy one of the properties defining a unit root process. This does not negate the possibility that these variables could exhibit extreme persistence (see Mitchell, 1993). One may detect the presence of unit roots in such series but that would be more indicative of the low power of the standard unit root tests given a long-memory autoregressive process as the alternative. We avoid this problem by estimating the steady-state in two ways for comparison purposes. First, we estimate a standard cointegration-error correction depiction of the relationship (as if the variables were integrated of order one). Second, we estimate a more traditional error-correction model using levels information to define the steady-state. A comparison of the two steady-state estimates (one direct from the cointegrating model and the other indirectly estimated from the levels information in the second error-correction model) provides a cross check for model reliability.

The regression analysis involved three steps:

1. A cointegration model to directly estimate the steady-state,
2. An error correction model constrained by the information obtained from the cointegration model,
3. A traditional error-correction model with levels information directly estimated and the steady-state indirectly estimated.

The cointegration regression is described as:

$$PLTU_t = \alpha + \beta UR_t + \varepsilon_t$$

where *PLTU* is the proportion of long-term unemployment (unemployed for more than 52 weeks) in total unemployment and *UR* is the aggregate unemployment rate. T is a time-subscript and ε is a random error term.

The variables are cointegrated if the residuals from this regression are stationary. For the period March 1978 to June 2000, the following results were obtained (*t*-statistics in parenthesis):

$$PLTU_t = \underset{(6.10)}{8.55} + \underset{(12.14)}{0.03}\, UR_t$$

$$R^2 = 0.64 \qquad CRDW = 0.43$$

where CRDW is the Cointegrating Regression Durbin Watson statistic. It provides some evidence of the existence of a steady-state relationship between *PLTU* and *UR*. A more formal test is based on the residuals of this regression. An Augmented Dickey-Fuller test on the residuals established that they were stationary (*ADF* = -3.61 for $k = 5$).

We conclude that the variables trend in a proportional manner over the sample period and the difference between them is stationary over the sample. This provides support for the proposition that if you maintain a low unemployment rate, the proportion of long-term unemployed will be low over time.

To provide more useful information about the effectiveness of targeted training programs, we then estimated a dynamic model of *PLTU*. Using a general-to-specific testing framework we estimated the following general model:

$$\Delta PLTU_t = \alpha + \sum_{i=1}^{k} \delta_i \Delta PLTU_{t-i} + \sum_{j=0}^{k} \gamma_i \Delta UR_{t-j} + \lambda RES_{t-1} + v_t$$

where Δ indicates the first difference operator, *RES* is the vector of residuals from the cointegrating regression, and *v* is a random error term. We started with $k = 4$ and then tested down using *F*-tests to simplify the model.

The final accepted simplification took the following form:

$$\Delta PLTU_t = \underset{(0.08)}{-0.01} \underset{(2.13)}{-0.02}\, \Delta PLTU_{t-1} + \underset{(5.78)}{0.03}\, \Delta UR_{t-1} \underset{(5.78)}{-0.03}\, \Delta UR_{t-1} \underset{(6.45)}{-0.31}\, \Delta\Delta PLTU_{t-3}$$

$$\underset{(3.40)}{-0.01}\, \Delta\Delta UR_t \underset{(4.53)}{-0.20}\, RES_{t-1}$$

$$R^2 = 0.65 \qquad s.e. = 1.17$$

The equation satisfies a range of standard diagnostic tests, which indicate that the estimated residuals are well-behaved (results available on request from author).

The resulting dynamics are rather complex but the significant point is that the long-run information from the cointegration equation is highly significant and of the correct sign. As *UR* falls, the relationship between the unemployment rate and *PLTU* increases beyond the steady-state relation. As a reaction, the change in *PLTU* is negative to restore the relationship. This is quite apart from the short-term dynamics of *PLTU*.

Both models were subjected to stability tests (Chow tests using recursive estimation) and no evidence of instability could be found over a wide range of sample splits. The stability of the relationship between *PLTU* and *UR*, suggests that targeted labour market programs have not had a significant effect. The evidence supports the notion that one should attack long-term unemployment by reducing the actual unemployment rate.

Given our remarks concerning the problems with unit roots tests on bounded variables, we estimated a conventional error-correction model with the levels information simultaneously estimated with the short-term dynamics (we added the lagged level of *PLTU* and *UR*) to a liberally lagged dynamic model and tested down to a parsimonious representation. Table 2 compares the long-run implied from the tested-down equation (static conception), compared to the estimation of the long-run generated by the cointegration equation. It is clear that the results are not dependent on assumptions made about the source of non-stationarity in *PLTU* and *UR*.

Table 2 Estimated long-run relations between PLTU and UR

Dependent Variable: PLTU	ECM Equation	Cointegration Equation
Constant	8.99	8.55
UR	0.024	0.025

4 Conclusion

The results raise questions about the current policy stance, which relies on tight interest rates to combat inflationary fears. In this type of policy environment, the low inflation comes at the cost of rising unemployment. From the modelling, it is clear that the long-term unemployment rate also rises, which arguably makes the wage setting system less responsive to the state of demand, reinforcing the inflationary bias in the distribution system (Mitchell, 1987). This finding is related to the hysteresis hypothesis, which emerged formally in the 1980s.

References

Carlin, Wendy and David Soskice (1990). *Macroeconomics and the Wage Bargain*, (Oxford University Press: Oxford).

Chapman, B.J., Junanker, P.N. and Kapuscinski, C.A. (1992). *Long Term Unemployment: Projections and Policy*, Discussion Paper No. 274, Centre for Economic Policy Research, Australian National University, Canberra.

Economic Planning and Advisory Commission (EPAC) (1996). *Future labour market issues for Australia*, Commission Paper No. 12, (AGPS: Canberra).

Mitchell, William (2000). "Full Employment Abandoned – the Role of the Public Sector", *Centre of Full Employment and Equity, Working Paper 00-06*, October.

Mitchell, William F. (1987). "The NAIRU, Structural Imbalance and the Macroequilibrium Unemployment Rate", *Australian Economic Papers* 26, 48, pp. 101-118.

Mitchell, William F. (1993). "Testing for Unit Roots and Persistence in OECD Unemployment Rates", *Applied Economics*, 25, pp.1489-1501.

Mitchell, William F. and Carlson, Ellen (2000), "Two hours-based measures of labour underutilisation and underemployment for Australia", *Centre of Full Employment and Equity, Working Paper 00-07*, November.

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