Labour Market Flexibility and the Output-Employment Ratio in Australia

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Abstract

This paper addresses two questions with regard to Australia's unemployment policies over the last decade: namely, the extent to which labour market reform has led to increased labour market flexibility; and the extent to which increased output per worker has meant that strong GDP growth has been translated into correspondingly large reductions in unemployment. With regard to the first question, we use shifts in the Beveridge Curve as a measure of changes in flexibility (following Solow). Shifts in the Beveridge Curve suggest that changes in the efficiency of labour market matching reflect the cyclical effects of hysteresis rather than the effects of labour market reform. With regard to the second question, we decompose changes in the output-employment ratio into structural effects, average hours effects, and residual factor intensity effects. We identify those sectors of the economy in which output per worker has increased significantly.

1. Introduction

The research reported on here seeks to address two questions with regard to the analysis of recent Australian experience:

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i) After nearly a decade of substantial reform of Australian labour market institutions what has been achieved in terms of macroeconomic labour market 'flexibility' and how might this achievement be measured?

ii) After an unbroken period of continuous strong GDP growth from 1992-1999, why were the results in terms of reductions in unemployment disappointing?

These are questions of importance for the assessment of both current policy and future prospects with regard to unemployment in Australia. The first question is important because of the perceived need for labour market flexibility as the key to reducing the equilibrium or natural rate of unemployment. The pursuit of greater 'flexibility' has been the underlying principle for the institutional changes instigated by Australian labour market policy since 1991. Greater flexibility, it is claimed, delivers greater efficiency in the operation of the labour market and therefore a lower level of 'structural' unemployment.

The second question concerns the rate of sustained GDP growth that is necessary to reduce unemployment in Australia. The relationship between changes in the unemployment rate and GDP growth can be analysed in terms of a 'benchmark' growth rate – the rate that GDP growth must exceed in order to generate sufficient employment growth to reduce unemployment. This benchmark is given by the sum of the growth rates in the labour force and in the output-employment ratio.

The issue of labour market reform has relevance for the second question as well as the first. It has been claimed that in addition to reducing structural problems, labour market reform and deregulation have also contributed to recent increased productivity growth (see Productivity Commission 1997). Higher productivity growth can, to some extent, be viewed as a double-edged sword in fighting unemployment. To the extent that increased productivity translates into increases in the output-employment ratio, this increases the rate of growth in output necessary to generate sufficient employment growth to reduce the unemployment rate. Thus, while productivity growth is necessary (to maintain international competitiveness, reduce unit labour costs and increase productive capacity), if sustainable growth in GDP is limited by other constraints (such as the Current Account, or non-wage inflationary pressures), then strong growth in output per employee can make reductions in unemployment more difficult to achieve.

With regard to the first question, there are a variety of approaches to defining and measuring 'flexibility'. These are briefly considered in Section 2. We employ Solow's (1997) measure of changes in labour market flexi-

bility: shifts in the Beveridge Curve – the inverse relationship between the unemployment rate, *u,* and the vacancy rate, *v.*

Since the inward and outward shifts in the Beveridge Curve follow upturns and downturns in the business cycle and correlate with changes in the proportion of long term unemployment, we infer that changes in labour market 'flexibility' over the period (as measured by shifts in the Beveridge Curve) represent cyclical effects on labour market efficiency rather than the steadily increasing effects of steadily expanding deregulation. Our analysis is supportive of the hysteresis hypothesis and the view that contractionary macroeconomic policy does long term damage to the efficiency of the labour market.

Section 3 of the paper addresses the second question – the output-employment ratio. We find that decomposing changes in the aggregate output-employment ratio into *sectoral composition* effects, *hours per employee* effects; and *residual gross labour productivity*, reveals that aggregate output per hour worked has increased significantly over the period. We identify those sectors of the economy where output per employee and output per hour worked have shown strongest growth.

While there has been a significant increase in the proportion of part-time employment, there has also been a significant increase in average hours for full-time workers. These offsetting effects have led to little change in average hours per employee in aggregate. To an extent, GDP growth has generated more work, and more intensive work, for full-time workers, at the expense of more jobs for unemployed workers.

We conclude by considering some implications of the analysis of the two issues for future Australian unemployment.

2. Labour Market Flexibility and the Beveridge Curve

The need for 'labour market flexibility' has been at the centre of most of the policy debates concerning unemployment. Comparisons have been made between European labour market 'sclerosis' and US labour market flexibility in seeking to explain their differences in unemployment rates. Nickell (1997) provides a summary of the arguments. Malinvaud (2000) analyses the debate in Europe in terms of the priority for structural reform over macroeconomic policy in reducing unemployment. Malinvaud concludes that, while 'rigidities' (such as high minimum wages and long duration unemployment benefits) are 'probably detrimental to employment in the medium and the long run' (p. 56), the empirical evidence of the benefits of reform is weak.

In Australia the perceived need for a more flexible labour market has provided the basis for policy initiatives which have resulted in significant institutional change in the operation of labour markets: Namely, a continuing shift over the last decade from centralised to decentralised wages policy, and the replacement of arbitrated peak bargaining with the development of deregulated bargaining at the workplace level.

It is not the aim here to provide a list or description of the succession of policy initiatives undertaken by successive governments in Australia in pursuit of 'flexibility'. Such analyses (see for example Stegman 1991; Stegman 1997; Burgess, Mitchell and Watts 1999; Campbell and Brosnan 1999) describe a continuing, uni-directional process toward less centralisation and less regulation in wages and labour market policies, dating from the introduction of a 'structural efficiency principle' in the 1987 National Wage Case, through to the 'second wave' Work Place Relations Act of 1999. Evaluating the efficiency gains from this process requires identifying a general measure of labour market flexibility which has also steadily improved over the period since 1987.

Differing views abound as to just what the concept of labour market flexibility entails. Some analyses concentrate on the effect of labour market institutions on wage flexibility, both relative wage flexibility between occupations and real wage flexibility at the aggregate level. (See for example OECD 1986 and also Nickell 1997) The effects of labour market reform on the wage and aggregate income distributions in Australia over the last decade have been well researched (see for example Burgess, Mitchell and Watts 1999; Debelle and Vickery 1998). Whether the wage outcomes reflect a more efficient labour market at the macroeconomic level is the issue addressed here.

As Solow (1997) points out, the concept of labour market flexibility is not usefully defined by merely listing the removal of regulations: the concept of flexibility should relate to the efficiency of the labour market and to the minimisation of 'structural' unemployment.

The distinction between 'structural' and 'cyclical' causes of unemployment is itself problematic. One approach in the literature to measuring the extent of structural unemployment is to measure inter-sectoral dispersion in labour market conditions. Intersectoral differences in labour market flows and unemployment rates may however still reflect cyclical causes, because different sectors may respond differently to cyclical shocks. (This is the basis of debate between Lillien (1982) and Abraham and Katz (1986) about the causes of US unemployment in the 1970s and early 1980s.)

Other approaches have sought to estimate a 'natural' or 'non-accelerating inflation' rate of unemployment in a Phillips Curve framework. Borland (1997) provides a summary of a number of Australian studies of this type.

Distinguishing between structural and cyclical unemployment is still problematic because of what has become known as 'hysteresis' (Franz 1990; Blanchard and Summers 1986). Under the hysteresis hypothesis, equilibrium unemployment depends on unemployment history. Specifically, experience of increased unemployment increases the future 'equilibrium' level through persistence mechanisms. These persistence mechanisms relate to the detrimental effects on labour market efficiency and 'matching', that unemployment experience causes by eroding human capital. Australian research clearly shows that the longer a person has been unemployed the less likely a move into employment ('duration dependence' – see for example Foster and Gregory 1983; Trivedi and Hui 1987; Brooks and Volker 1984). Long term unemployment erodes the work skills, the search effectiveness, and the job readiness of those unemployed. The long term unemployed fail to represent an effective supply of labour to fill available vacancies. Therefore many empirical models which wish to include an hysteresis effect, use the proportion of unemployment which is long term as the (inverse) measure of efficiency in labour market matching. (For example: Borsch-Supan 1991; Jackman, Layard and Pissarides 1989)

In this paper we concentrate on Solow's (1997) measure of labour market flexibility: shifts in the Beveridge Curve – the relationship between the unemployment rate, u and vacancy rate, v. An inverse relationship between vacancies and unemployment can be derived from a variety of theoretical models. These models range in complexity from models like Jackman, Layard and Pissarides' (1989), where the Beveridge Curve results from the adjustment of labour market flows and the 'matching' process, to Solow's (1997) simpler approach.

In Solow's simple theoretical model, movements along the Beveridge Curve (North West or South East) reflect antipodal cyclical changes in u and v. Changes in the efficiency with which vacancies and unemployment can be matched – changes in the extent of 'structural' problems in the labour market – are reflected in shifts inward or outward of the Beveridge Curve.

Figure 1 depicts the Beveridge Curve for Australia 1979 to 1997.[1] The graph suggests that the Beveridge Curve shifted outwards after 1983, shifted inwards in the late 1980s, and shifted out again after 1992. The deteriorations in labour market efficiency immediately follow the recessions of 1982-83 and 1991-92. The improvement in efficiency follows a period of strong GDP growth over the late 1980s. Thus the graph is strongly

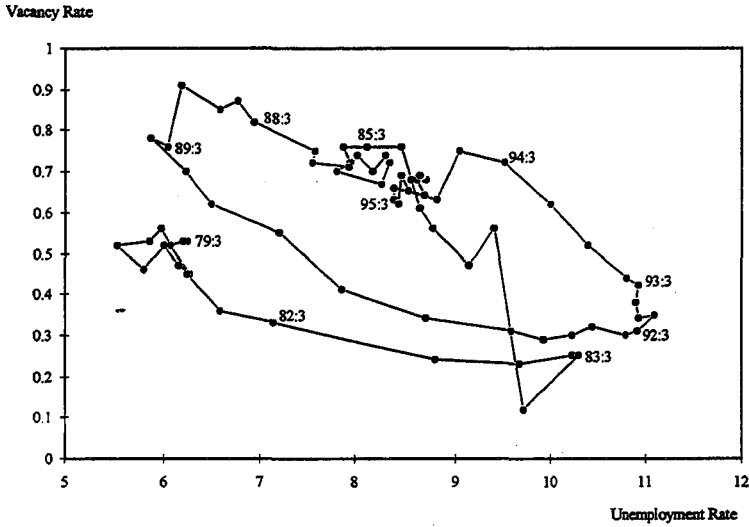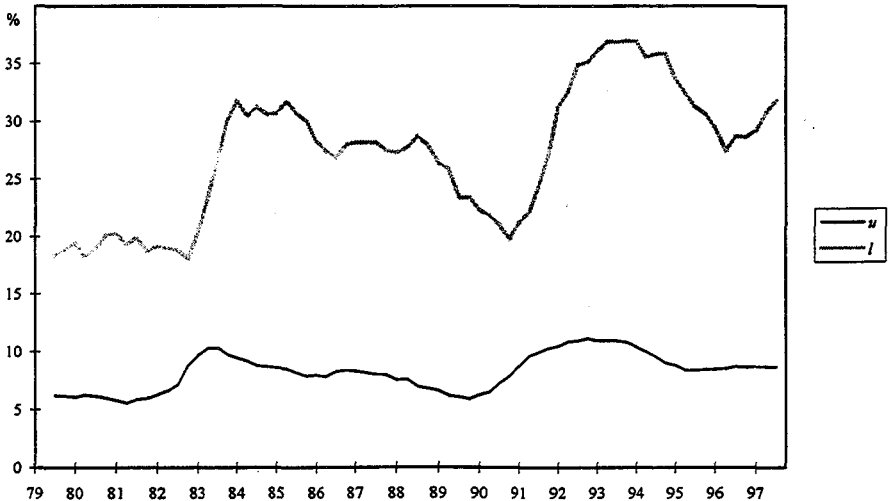**Figure 1.** The Australian Beveridge Curve: 1979:3–1997: 3

Vacancy Rate

Figure 2. Long-Term Unemployment as a Proportion of Total Unemployment

suggestive of the effects of the persistence mechanisms of the hysteresis hypothesis.

Figure 2 graphs the unemployment rate, u, and the proportion of unemployment which is long term (duration greater than 12 months), l, and shows that the proportion of total unemployment which is long term appears to follow the cycle with a lag. Figure 2 therefore is also strongly suggestive of persistence mechanisms and in particular the effects of adverse cyclical shocks.

While Figure 1 clearly suggests cyclical shifts in the Beveridge Curve, more rigorous econometric analysis of the time series properties of u, v and l can provide support for the hysteresis hypothesis. In a related paper (Stegman and Stegman 1999) we have reported on the results of subjecting Australian data on unemployment and vacancies over the period 1979 to 1997 to time series analysis. We tested for stationarity in the data series for the variables, estimated long run cointegrating relationships between the variables, and investigated the short run dynamics implied by these estimated relationships in a Vector Error Correction (VEC) model. We found that there is no long run cointegrating relationship between u and v over the data period. This we interpreted as evidence of significant shifts in the Beveridge Curve relationship.

We also found that the short run dynamic adjustments to shocks to each of the three variables, u, v and l, derived from a VEC model, are consistent with labour market adjustment processes. This we interpreted as providing support for the estimated cointegrating relationship between u, v, and l. Furthermore the pattern of the responses over time are strongly suggestive of 'hysteresis'. Cyclical shocks to demand for labour translate into initial increases in unemployment which then results in increased long term unemployment through the effects of increased unemployment experience on the search effectiveness and job-readiness of the unemployed. This deterioration in labour market efficiency adversely effects matching, and the level of unemployment for any given level of vacancies then increases.

Time series analysis then provides support for our interpretation of Figure 1: changes in labour market 'flexibility' over the period (as measured by shifts in the Beveridge Curve) represent cyclical effects on labour market efficiency rather than the steadily increasing effects of steadily expanding deregulation.
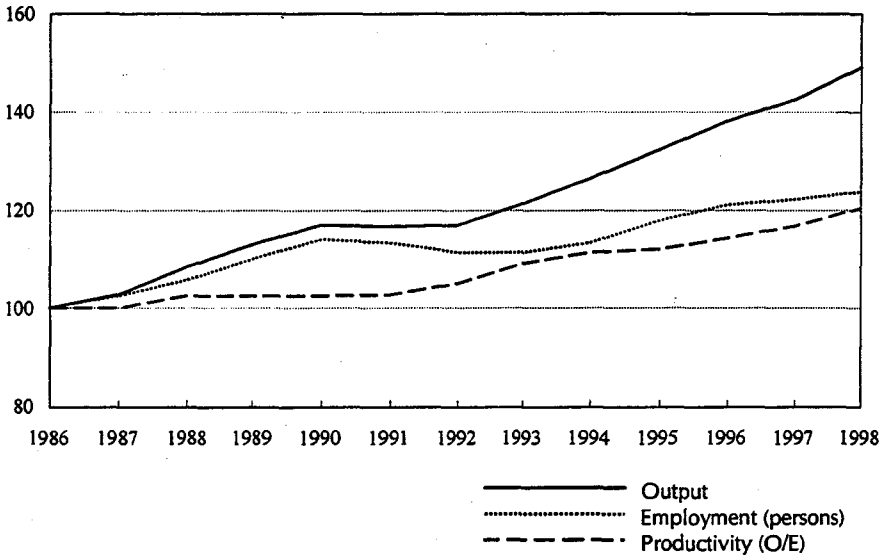
3. The Output / Employment Ratio

The relationship between changes in the unemployment rate and GDP growth can be analysed in terms of the Okun's Law identity which implies that *to maintain a constant unemployment rate, aggregate output must grow at a rate equal to the sum of the growth rates in the labour force and in output per person employed.* Thus we have a benchmark for GDP growth. Growth in aggregate production of goods and services must be sufficient to generate enough extra jobs to provide for a growing work force, and to provide for the fact that each worker can produce a higher volume of output. (This is not to imply that an appropriate cure for unemployment is to reduce productivity growth. The point is, that to avoid increased unemployment, productivity growth must be used to increase production of goods and services, rather than to save on the number of jobs.) If output growth falls below the benchmark, the unemployment rate will increase. For a reduction in the unemployment rate, output growth is required to be greater than the benchmark rate. Table 1 depicts labour force growth for Australia 1987-1998

Table 1. Year-ended Growth – Total Economy

	Labour force L %	Output O %	Employment E(persons) %	Productivity O/E(persons) %	Employment E(hours) %	Productivity O/E(hours) %
1987	3.08	2.85	2.69	0.16	3.00	-0.15
1988	2.45	5.42	3.01	2.34	3.69	1.67
1989	2.75	4.17	4.03	0.13	3.49	0.65
1990	3.24	3.68	3.75	-0.07	4.81	-1.07
1991	1.73	-0.30	-0.63	0.33	-1.61	1.33
1992	0.33	0.24	-1.87	2.16	-2.42	2.74
1993	0.66	3.71	-0.04	3.75	-0.31	4.04
1994	1.42	4.14	1.92	2.18	3.32	0.79
1995	2.19	4.63	4.01	0.60	4.17	0.44
1996	2.01	4.49	2.58	1.87	2.70	1.75
1997	1.18	3.17	0.96	2.19	0.25	2.91
1998	0.96	4.64	1.38	3.22	1.20	3.40

For the period of sustained GDP growth from 1993-1998, the year on year growth rate in the labour force averaged 1.40 percent per annum. In the period from 1984 to 1990 – also a period of sustained GDP growth – the labour force growth rate averaged 2.68 percent per annum. Over the previous decade (1974-1983) which included two recessions, labour force growth still averaged 1.6 percent per annum. Unusual increases on the labour supply side cannot therefore be held responsible for the disappoint-

Figure 3. Output and Employment (persons) – Total Economy

Legend:
— Output
.... Employment (persons)
— — — Productivity (O/E)

ing failure of the unemployment rate to fall significantly in the 1993-1998 period.

Given labour force growth, the benchmark growth rate depends on the output/employment ratio (O/E). Table 1 also presents output (GDP) growth, employment growth (persons), and the implied growth in O/E for the aggregate economy for the period 1987-1998. Figure 3 provides index numbers for these three variables to depict their growth paths.

Year-ended GDP growth over the six years from 1993 to 1998 averaged 4.13 percent per annum. Given the potential detrimental effects of the East Asian recession, this compares favourably with the 4.02 percent per annum averaged over the period 1984 to 1990.

What has been different in the most recent recovery has been the growth in output per person employed. For the 1993-1998 period growth in O/E has averaged around 2.4 percent per annum. The strong GDP growth therefore has delivered employment growth of only 1.7-1.8 percent per annum, just beating the low labour force growth. In comparison, over the 1984-1990 period O/E grew at an average rate of around 0.8 percent per annum and employment growth averaged 3.23 percent per annum.

The measurement of the output / employment ratio may be distorted by the inclusion of sectors of the economy for which the measurement of output is based on input values. Table 2 presents output (GDP) growth, employ-

ment growth (persons), and the implied O/E ratio, for the 'Market Sector' which excludes Finance and Insurance, Property and Business Services, Government Administration and Defence, Education, Health and Community Services, and, Personal and Other Services. Figure 4 provides the growth path for the three variables.

Table 2. Year-ended Growth – Market Sector

	Output O %	Employment E(persons) %	Productivity O/E(persons) %	Employment E(hours) %	Productivity O/E(hours) %
1987	0.9	1.5	-0.6	1.5	-0.6
1988	5.7	2.2	3.4	3.2	2.4
1989	6.2	4.8	1.4	3.5	2.7
1990	2.7	3.1	-0.4	3.8	-1.1
1991	-1.1	-2.2	1.1	-3.1	2.0
1992	-1.2	-3.2	2.0	-3.8	2.6
1993	3.3	-0.8	4.1	-0.3	3.6
1994	5.2	2.2	3.0	3.2	1.9
1995	3.2	3.7	-0.6	4.0	-0.8
1996	4.2	1.6	2.6	1.0	3.2
1997	4.4	0.6	3.8	0.1	4.3
1998	4.6	0.4	4.2	0.5	4.1

As would be expected, growth in the measured O/E ratio over the period 1993 to 1998 has generally been stronger when 'non-market' sectors are excluded. The output / employment ratio is a crude measure of average labour productivity.

Many studies of productivity seek to allow for changes in capital inputs and estimate 'Multi Factor Productivity' (MFP). (See Productivity Commission 1997; 1999). We do not follow that approach here because our interest is in the employment / output ratio rather than the allocation of productivity changes between factors, and we are not prepared to make the strong assumptions necessary to define and estimate MFP.

As the output / employment ratio is the reciprocal of factor intensity for labour input measured in persons, changes in the aggregate ratio are a reflection of:

i) changes in the structure of the economy which change the relative contribution of sectors with differing factor intensities;

ii) changes in aggregate average hours worked per person employed, reflecting changes in average hours within sectors; and

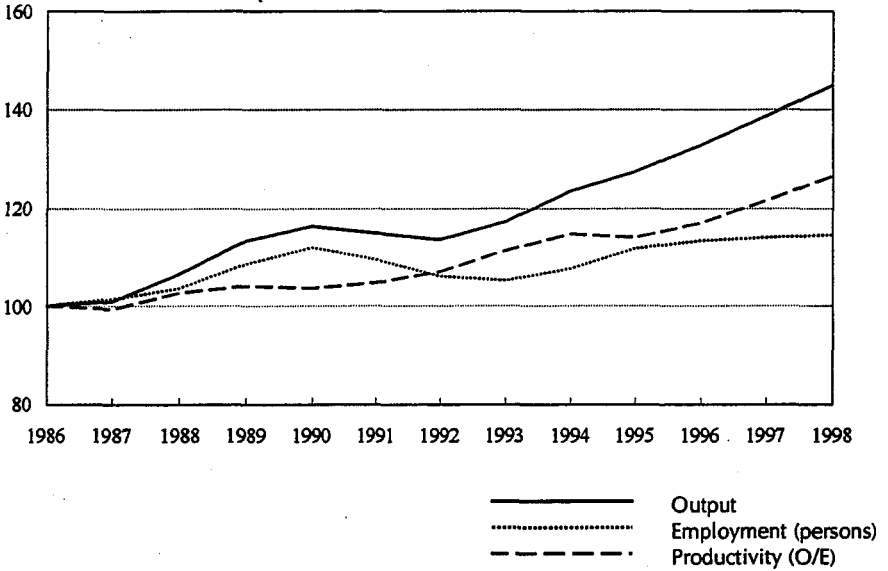**Figure 4.** Output and Employment (persons) – Market Sector

——————		Output
··························		Employment (persons)
— — — — ·		Productivity (O/E)

Figure 5. Output and Employment (persons) Weighted by Sector – Market Sector

——————		Constant Share O/E
— — — — —		O/E
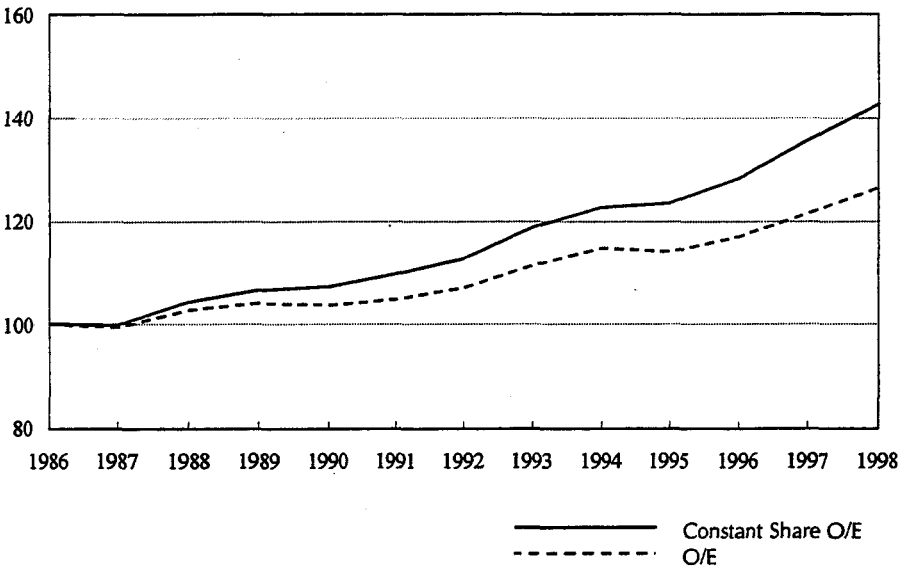
Figure 6. Output and Employment (hours) – Total Economy

Output
Employment (hours)
Productivity (O/E)
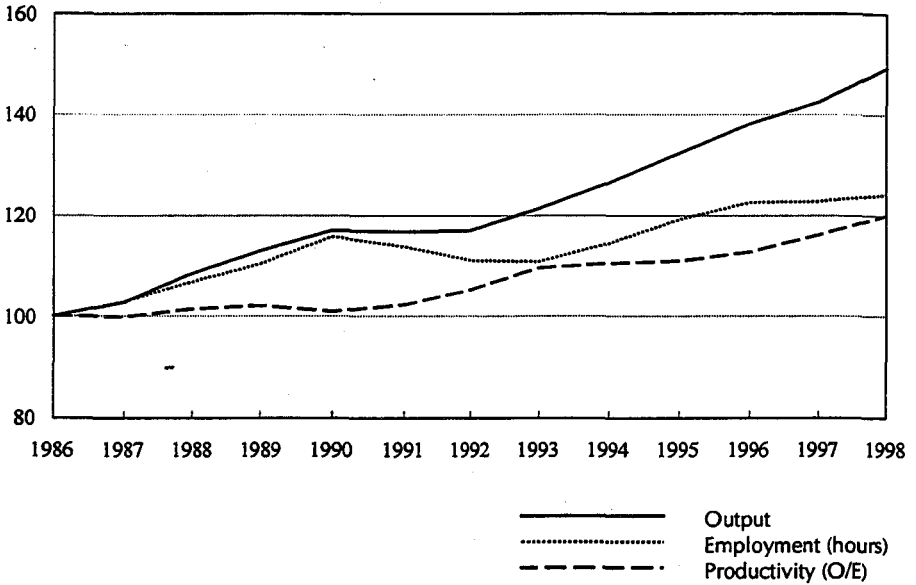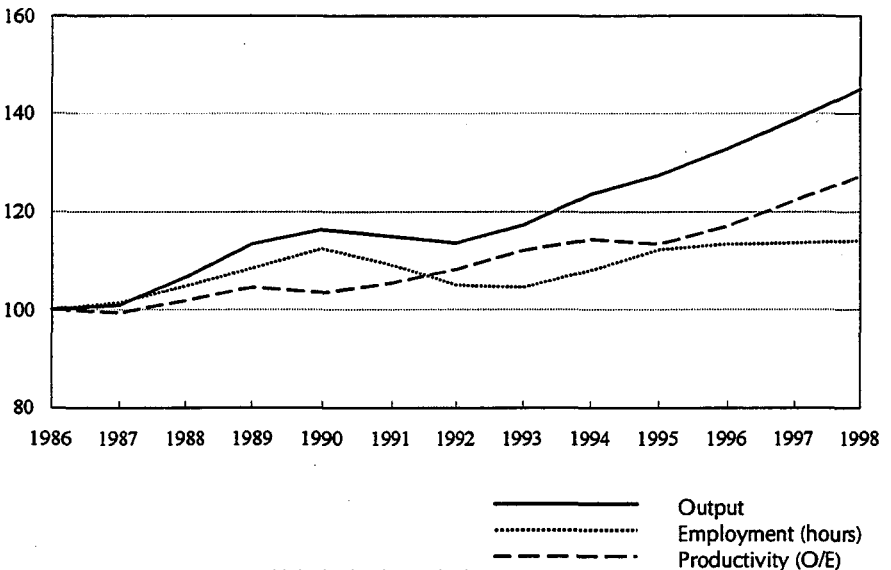
Figure 7. Output and Employment (hours) – Market Sector

Output
Employment (hours)
Productivity (O/E)

iii) changes in factor intensities within sectors, reflecting changes in the technology and operational efficiency of production.

To gauge the effect of changes in the sectoral composition of output, we compute the hypothetical value of the output / employment ratio over the period, weighting each sector's contribution according to its relative share of total employment in the initial period (See Figure 5). Comparing this fixed weight O/E ratio to the actual aggregate ratio demonstrates that changes in the sectoral composition have acted to reduce the O/E ratio. That is, growth in output per person employed would have been even higher if the structure of the economy had not changed over the period.

We now turn to the effects of changes in average hours. The last two columns of Tables 1 and 2 report growth rates for employment and implied productivity, when employment is measured in hours rather than persons, for the total economy and the market sector respectively (Figures 6 and 7 depict these growth rates in index numbers).

A comparison of Figures 6 and 7 (hours), with Figures 3 and 4 (persons), shows no significant differences. This reflects the fact that aggregate average hours have remained relatively constant over the period. This is somewhat surprising given the substantial rise in the proportion of part-time employment: Part-time employment steadily increased from 18.4% of total employment in 1986 to 25.5% of total employment in 1998.

The rise in part-time and casual employment resulting from the institutional changes over the period has been the subject of some analysis (see Campbell and Webber 1996). Concurrent rises in the proportion of part-time workers who desire more hours implies that a significant proportion of part-time work represents under-employment. In September 1998, the ABS estimated that almost one quarter of all part-time workers wanted to work more hours (ABS Catalogue No. 6265).

The main factor offsetting the effect of an increased proportion of part-time employment over the period is the increase in average hours for full-time employment (See Figure 8).

Since neither changes to the structure of the economy nor changes in aggregate average hours worked have generated increases in the output / employment ratio, we conclude that increases in the ratio have mainly resulted from within sector changes in technology and improvements in the operational efficiency of production.

Table 3 presents output growth and employment growth (in both persons and hours) for particular sectors, and the implied growth in productivity measures.
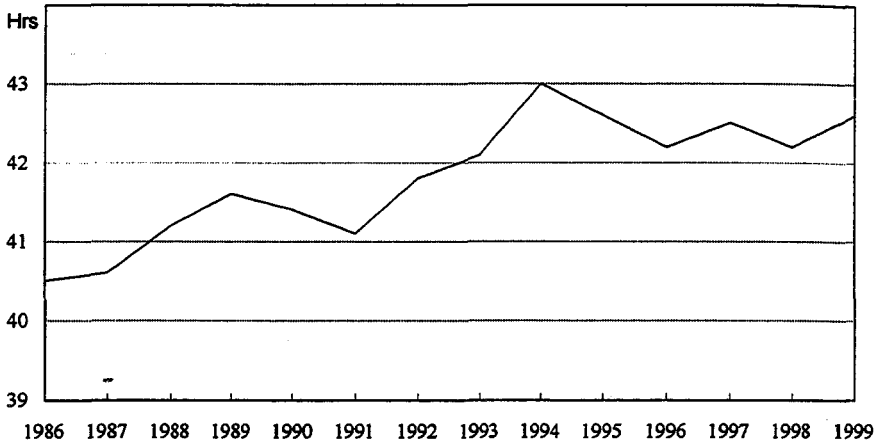
Figure 8. Average Full-Time Hours (per week)

Table 3. Growth in Output, Employment and Productivity by Industrial Sector, 1986–1998

	Output O %	Employment E(persons) %	Productivity O/E(persons) %	Employment E(hours) %	Productivity O/E(hours) %
Agriculture, Forestry and Fishing	23	1	23	-1	25
Mining	88	-22	140	-7	101
Manufacturing	26	-1	27	4	22
Electricity, Gas and Water	40	-55	214	-51	185
Construction	42	25	13	31	8
Wholesale Trade	56	17	33	20	30
Retail Trade	36	31	4	19	15
Accommodation, Cafes and Restaurants	48	77	-16	71	-14
Transport and Storage	46	8	35	14	28
Communication	185	-2	191	6	170
Finance and Insurance	93	6	81	10	75
Property and Business Services	89	99	-5	106	-8
Government Administration and Defence	30	3	27	7	22
Education	33	29	3	44	-7
Health and Community Services	52	40	8	37	11
Cultural and Recreational Services	46	60	-9	53	-4
Personal and Other Services	50	53	-2	59	-6

Note: Because of the magnitude of the changes over the 12 year period, the useful approximate identity
Output growth rate = Employment growth rate + Productivity growth rate does not hold.
Sectoral year-on-year growth rates are available from the authors on request

The highest growth rates in the O/E ratio have been in Mining; Electricity, Gas and Water; Communication; and Finance and Insurance. While the mining sector has experienced significant changes in industrial relations, the latter three are sectors which have experienced significant product market reforms through competition policy. The concentration of the economy's productivity growth in these industries suggests that, rather than reflecting the general effects of labour market reform, productivity growth has been more the result of industry-specific product market reforms. Retail Trade and Accommodation, Cafes and Restaurants evidence a surprising lack of productivity improvement. This may be due to unmeasured 'quality' improvement with the deregulation of trading hours (see Productivity Commission 1999).

4. Conclusion

Analysis of Beveridge Curve variables and the determinants of the output-employment ratio for Australia suggest the following conclusions:

The labour market works more efficiently when workers who suffer a spell of unemployment do not become long term unemployed. Long term unemployment, by eroding job skills, search effectiveness, and job readiness, creates structural inefficiencies in the labour market. Recessions in GDP growth do long term damage to the efficiency of the labour market through the persistence mechanisms of the hysteresis hypotheses.

Changes in labour market flexibility in recent Australian experience, interpreted in terms of changes in the efficiency of matching, reflect the cyclical effects of hysteresis rather than the effects of deregulation and reform.

While growth rates in output over the period 1992-1998 have been high, the failure of the unemployment rate to fall significantly should not be surprising given the arithmetic of the Okun's Law benchmark. Recovery in unemployment after a recession requires sustained rates of GDP growth in excess of the sum of the growth rates in output per person and the labour force. Labour force growth has been low in the recent period, but strong growth in output per person employed has weakened the translation of GDP growth into employment growth.

The increase in the aggregate output / employment ratio is a reflection of strong growth in average hours for full time workers, offsetting an increased proportion of part-time workers. Thus we see the development of a bifurcated labour market – a declining proportion of workers who have full-time permanent jobs, but these jobs have longer average hours, and an

increasing proportion of workers with 'precarious' employment in casual and part-time jobs working insufficient hours. This phemonenon is reminiscent of the 'dual labour market' hypothesis of Doeringer and Piore (1975).

The increase in output per hour worked for the economy is the result of increased labour productivity in particular sectors – Mining; Electricity, Gas and Water; Communication; and, Finance and Insurance. These increases seem to reflect specific industry reforms particularly in product markets, rather than general labour market reform.

As a general conclusion, we believe that the evidence for hysteresis, and the limits to generating sufficient sustained GDP growth in a recovery to match labour force and productivity growth, mean that contractionary macroeconomic policy has significant long run detrimental effects – in contrast to what is suggested by New Classical and Rational Expectations theories.

Note
1 Changes in the Australian Bureau of Statistics definition for the vacancy series led to our decision to omit data from 1998-1999 from this study, as there are insufficient data points under the new definition for a reliable assessment of the effects of the changes on the vacancy series.

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Appendix

The data series in this paper were taken from ABS Catalogue Nos. 6202.0, 6203.0, 6354.0, 5204.0 and 5206.0. The data is available on disk from the authors by request.

Year-ended growth indices were calculated as in ABS Catalogue No. 5204.0. They relate to annual observations for the year ending June. As noted in footnote 1, changes in the Australian Bureau of Statistics definition for the vacancy series led to our decision to omit data from 1998-1999 from this study.