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Accounting for the unemployment decrease in Australia

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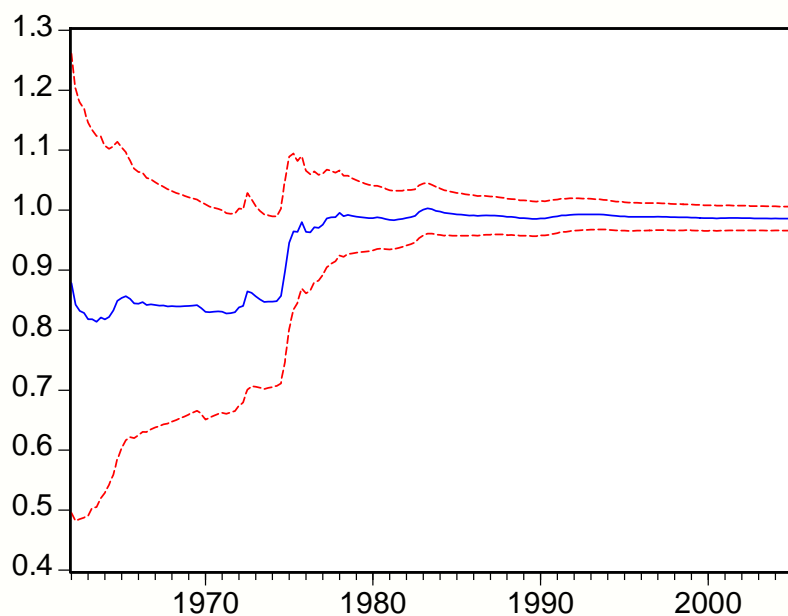
1. Introduction

Australia has enjoyed a long period of expansion since the early 1990s recession. A beneficial feature of this expansion has been the reductions in official unemployment, although there has been a concomitant increase in underemployment (Mitchell and Carlson, 2001). In this paper, we provide an accounting of the decline in unemployment since the peak in 1992 and compare the results with the decline in unemployment that occurred following the peak in the previous recession in 1982. We seek, as part of a broader spatial analysis of long-term unemployment in Australia, to separate out the factors that might be operating from the supply side from those operating from the demand side. We stress that this is an accounting exercise and is a precursor to a more detailed behavioural/structural study of regional unemployment (see Mitchell and Bill, 2005).

Mitchell (2001) examined the persistence of the unemployment rate across 18 OECD economies. The general conclusion is that all the countries examined exhibited significant degrees of persistence to negative shocks. Mitchell (2001) also found that the persistence was compounded by the cyclical asymmetry in the behaviour of the unemployment rate. In other words, when the labour market contracts significantly the rise in unemployment is large and rapid and improves very slowly over a protracted period as the economy enters the upturn. The costs of a recession are therefore magnified and spread out over a lengthy period.

Figure 1 shows the changing estimates of the AR(1) parameter in the recursive least squares regression of log unemployment rate on one lag and a constant for the sample of 1959:4 to 2005:1. It shows that the degree of persistence (measured by the AR1 coefficient) is very high (0.98) and shifted dramatically upwards during the 1974-75 recession (see Mitchell, 2001 for more analysis).

Figure 1 Recursive estimates of the AR(1) parameter for unemployment, Australia



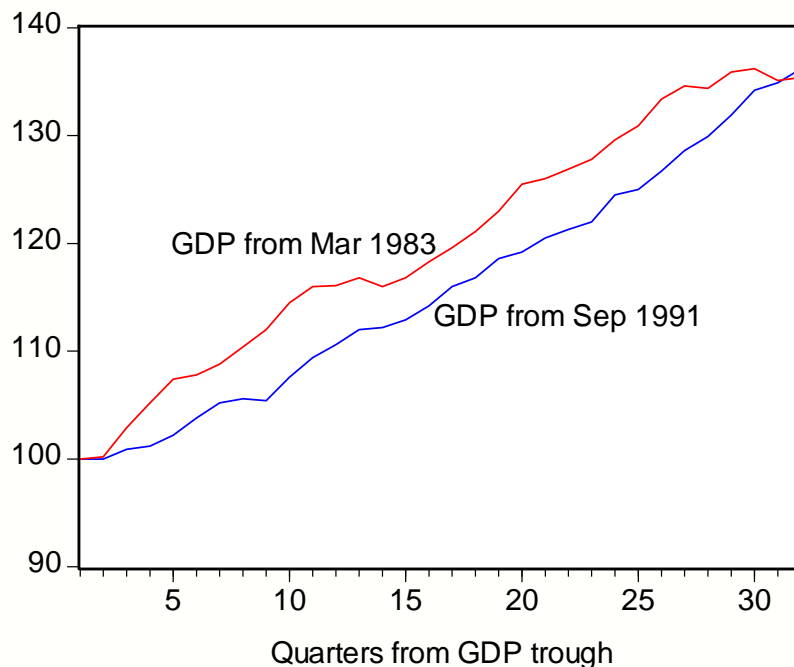
Source: Recursive least squares regression of log unemployment rate on one lag and a constant. The plotted coefficient is the estimated AR(1) parameter for 1959:3 to 2005:1.

The paper is laid out as follows. Section 2 introduces some stylised facts about key labour market relationships in Australia over the last two business cycles. The aim is to provide the basis for the labour market accounting framework outlined in Section 3. Section 4 considers demand decompositions while Section 5 considers the supply decomposition. Section 6 examines the results over the entire recent business cycle (until now) and concluding remarks follow. The overwhelming result is that unemployment is largely a function of too few jobs being produced by the economy.

2. Some stylised facts about GDP recoveries in Australia

What has been the relationship between employment and Gross Domestic Product (GDP) over the last two business cycles? Figure 2 shows the evolution of GDP for 30 quarters following its trough in the respective business cycles (March 1983 and September 1991). Clearly, the 1980s expansion was more robust initially, but once growth got underway in the 1990s it soon outstripped the 1980s mid-term growth performance.

Figure 2 Index of GDP expansions, 1980s and 1990s recoveries

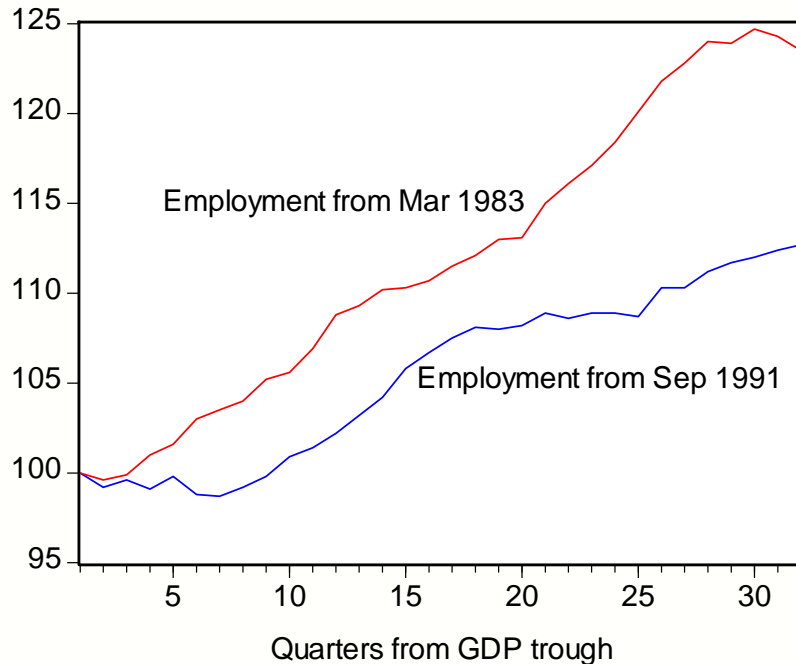


Source: ABS Ausstats, March 1983=100 and September 1991 = 100, in respective panels.

Figure 3 presents a corresponding comparison of the evolution of employment over the two recovery periods (32 quarters following the respective GDP troughs). The strong employment growth (Australia had the strongest growth in the OECD during the latter half of the 1980s) in the 1980s is by contrast to the sluggish employment evolution following the 1991 GDP trough. As GDP grew in the latter part of 1991 and into 1992, employment continued to fall. It took 10 quarters before it reached an index value of 100.9 and entered positive growth. This is by contrast to the 1980s when even though employment growth lagged GDP growth, the index reached 101.0 after only 4 quarters. Further in the latter part of the expansion – around 5 years into the 1990s growth phase, employment growth accelerated while at this point in the 1990s

recovery, employment growth was starting to falter. What explains these disparate movements in employment growth despite the strong relative GDP growth in the mid-cycle of the 1990s?

Figure 3 Index of employment expansions, 1980s and 1990s recoveries.



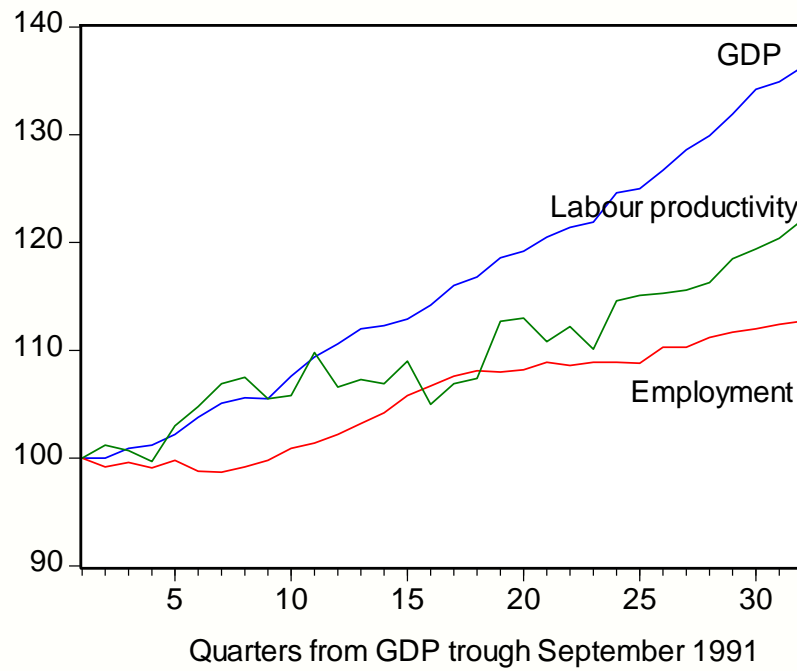
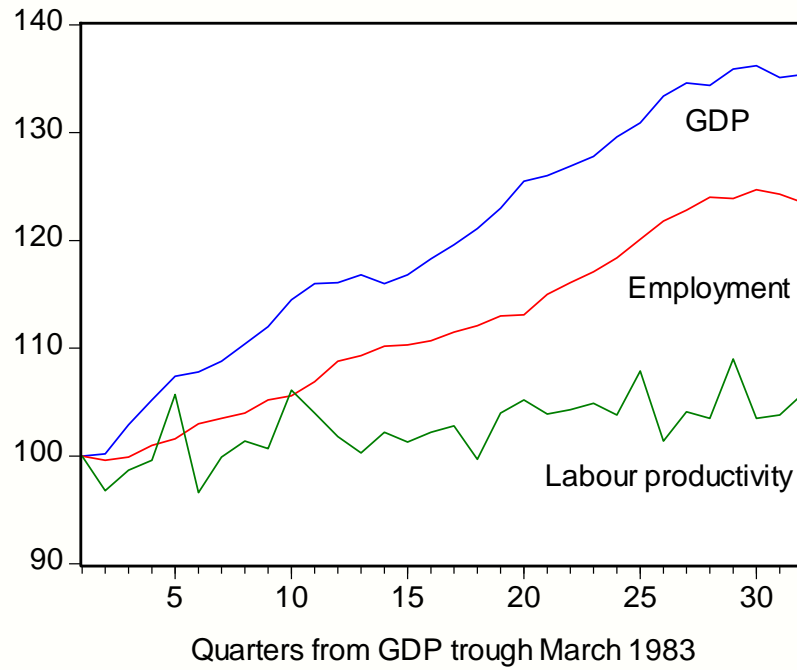
Source: ABS Ausstats, March 1983=100 and September 1991 = 100, in respective panels.

Figure 4 shows the GDP and employment indexes for 30 quarters following the GDP trough in March 1983 (until June 1990 which was the next cyclical GDP peak and the end of the cycle).

A striking point is that productivity growth has behaved differently in the growth phases following the last two recessions. Labour productivity growth (measured in labour hours) was much higher in the 1990s recovery than in the 1980s and as a consequence employment growth was slower. The responsiveness of employment to GDP growth was extremely slow in the 1990s recovery and contributed to the increasing duration of unemployment throughout the 1990s when compared to the 1980s. The slow responsiveness is also demonstrated in Figure 5, which compares the relationship between GDP growth and employment growth during the recoveries from the GDP trough in the 1980s and 1990s. The results reveal that in the early growth phase in the 1990s recession, employment growth remained negative for longer. The recovery in employment after the 1980s GDP trough (March 1983) was more speedy.

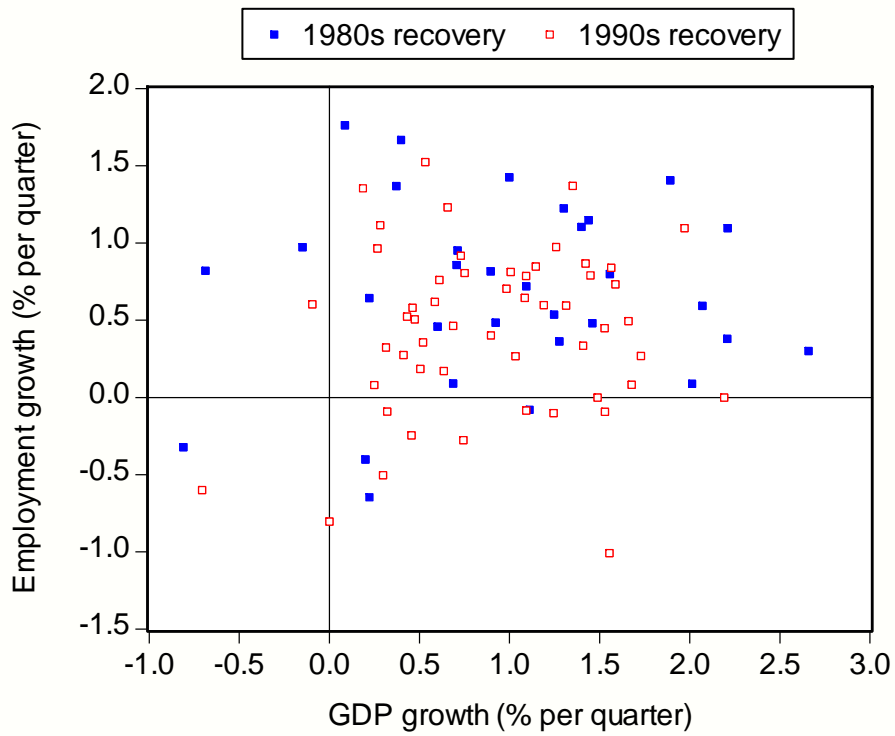
The behaviour of unemployment (see Figure 6) reflects these ‘demand’ side trends although there are variations on the supply side that are also important. In the next section we outline an accounting framework for decomposing the demand and supply side influences so that their individual contributions can be assessed more carefully.

Figure 4 GDP, employment and productivity indexes for 1980s and 1990s recoveries



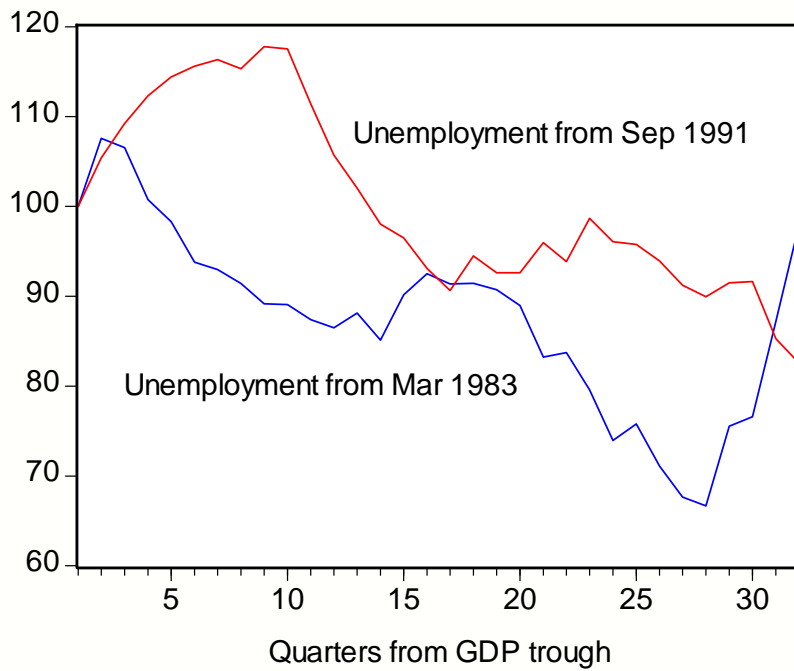
Source: ABS Ausstats, March 1983=100 and September 1991 = 100, in respective panels.

Figure 5 Growth in GDP and employment, 1980s and 1990s recoveries



Source: ABS Ausstats, Labour Force Survey, author's calculations.

Figure 6 Unemployment during the 1980s and 1990s recoveries



Source: ABS Ausstats, Labour Force Survey, author's calculations.

3. A labour market accounting framework

Over any business cycle there are both demand and supply forces operating which combine to produce a given quantity outcome. In this section we outline an accounting framework that allows us to present changes in unemployment in terms of labour demand and supply decompositions.

3.1 Labour supply decomposition

The supply side of the labour market can be expressed in terms of the following identity:

$$(1) \quad E \equiv WAP * (LF / WAP) * (E / LF)$$

where E = employed persons, WAP is the working age population, and LF is the labour force (employed + unemployed). So LF/WAP is the labour force participation rate and E/LF is the employment rate. The relationship can then be expressed in growth rates where the growth of persons employed (e) is approximately equal to the sum of the growth in working age population (p), labour force participation (pr) and the employment rate (er).

$$(2) \quad e \approx p + pr + er$$

3.2 Labour demand decomposition

Similarly, the demand side can be decomposed by the following identity, which links gross domestic product (GDP) to persons employed times average quarterly working hours per person employment (AWT) times labour productivity per hour worked (LP).

$$(3) \quad Y \equiv E * QWT * LP$$

In growth rates, output growth (y) is approximately equal to the sum of the growth of persons employed (e), total hours worked per person (h) and labour productivity (g):

$$(4) \quad y = e + h + g$$

We can also segment employment on the demand side into a GDP effect, an hours effect, and a labour productivity effect. The following equation generates the (approximate) decomposition.

$$(5) \quad \Delta N \approx \left(\frac{\Delta Y}{Y} \right) N_0 - \left(\frac{\Delta P}{P} \right) N_0 - \left(\frac{\Delta H}{H} \right) N_0$$

where ΔN is the total change in employment, ΔY is the change in GDP , H is the average quarterly hours worked, and P is the measure of labour productivity in hours. The subscript refers to the base period.

4. Decomposing labour supply factors

Based on Equations (1) and (2), Table 1 shows the components of employment growth on the supply side of the labour market, which capture demographic and employment behaviour (see Werner, 1999). The two recoveries exhibit strikingly different behaviour. The muted 1991 recovery is echoed by all components of employment growth on the supply side.

The 1983 recovery was much more immediate and quickly began to reduce the unemployment that had risen sharply. By contrast, the 1991 recovery was associated with negative employment growth (and a declining employment rate) for two years after the GDP trough. Fortunately, labour force growth was very low and so the resulting rise in unemployment from this source was less than it may have been had labour force growth been of the same magnitude as in earlier recoveries.

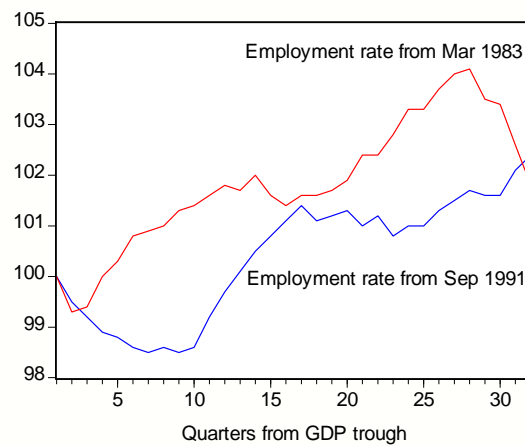
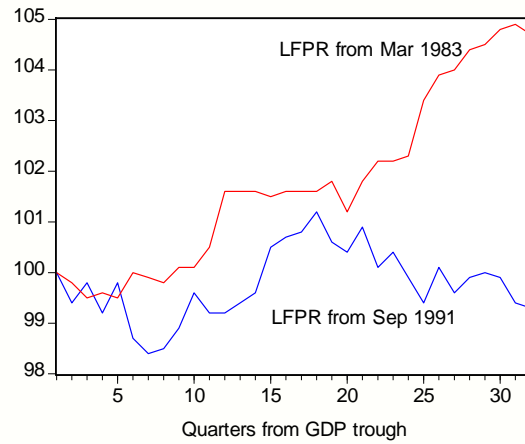
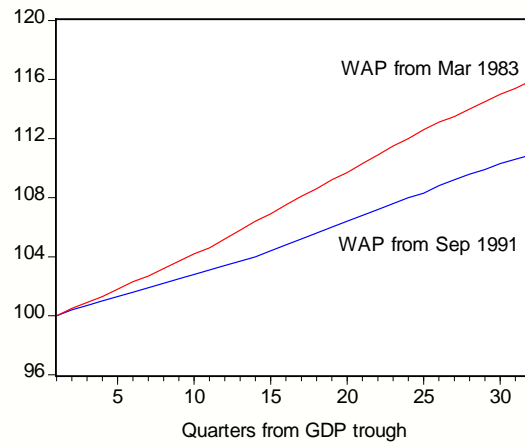
Table 1 Components of employment growth on supply side, 1980s and 1990s

Quarters from trough	%Δ EMP	%Δ WAP	%Δ LFPR	%Δ EMPR
From Mar 1983				
4	1.56	1.81	-0.52	0.27
8	5.18	3.68	0.13	1.32
12	9.33	5.79	1.62	1.69
16	11.49	8.05	1.58	1.57
From Sep 1991				
4	-0.22	1.27	-0.23	-1.25
8	-0.23	2.47	-1.12	-1.53
12	3.17	3.72	-0.63	0.10
16	7.55	5.21	0.84	1.37

Source: Percentage changes between the recession troughs (March 1983 and September 1991) and various horizons in terms of quarters. The numbers do not add exactly to meet the relevant identity constraints. EMP is total employment, WAP is the working age population, LFPR is the labour force participation rate, and EMPR is the employment rate (employment as a percentage of the labour force).

Figure 7 presents these respective supply components of employment growth. The impact of the sluggish employment performance early in the 1990s recovery on unemployment was attenuated by the declining working age population growth and the slight downward movement in the labour force participation rate. Had these trends following the 1980s patterns unemployment would have been significantly worse through the 1990s. In other words, supply factors meant the unemployment rate was actually lower than it might have otherwise been. Part of this is explained by the increasing numbers of older (male) workers who left the labour force in the early 1990s and took disability support pensions (DSP) or early retirement. A significant number of the older not in the labour force category actually reflected a lack of jobs rather than lifestyle decisions about retirement. It is also likely that the rising incidence of DSP recipients in this period was in part due to the state of the labour market. In 1990, there were 328.2 on DSP and 91.9 thousand classified as Disability Support Pension. By 1997 the DSP recipients had skyrocketed to 527.5 thousand with 91.3 classified as Disability Support Pension-Wives (see DSS, various).

Figure 7 Indexes of the working age population, labour force participation and the employment rate, 1980s and 1990s recoveries.



Source: ABS Ausstats, March 1983=100 and September 1991 = 100, in respective panels.

Table 2 converts the supply decompositions by percentage changes into actual persons. While unemployment fell by a greater amount in the 4 years following the September 1991 GDP trough compared to the 4 years following the March 1983 GDP trough it was a result of sluggish labour force growth rather than employment growth. The real problem was the failure of the economy to generate an employment growth rate commensurate with the previous recession.

Table 2 Supply side contributions to change in unemployment

	Change in EMP (000s)	Change in LF (000s)	Contribution to Change in UN (000s)
From Mar 1983			
4	99.8	89.7	10.1
8	332	266.9	65.1
12	597.3	526	71.3
16	735.7	683.9	51.8
From Sep 1991			
4	-17.4	88.5	-105.9
8	-18.2	112.5	-130.7
12	246.5	261.4	-14.9
16	587.6	518.9	68.7

Source: Absolute changes between the recession troughs (March 1983 and September 1991) and various horizons in terms of quarters. EMP is total employment, LF is the labour force, and UN is aggregate unemployment (LF-EMP).

5. Decomposing labour demand factors

Based on Equations (3) and (4), Table 3 shows the components of employment growth on the demand side of the labour market – that is, the economic growth factors. There are two notable features shown in this table. When GDP growth is strong, employment growth is strong. The behaviour of labour hours productivity (and labour force growth) in the 1974 recovery goes a long way to explaining why unemployment rose so quickly and failed to return to previous levels. Even with assistance from sharp declines in average weekly hours worked, the GDP growth rate was not sufficient to match the job losses implied by the productivity growth. The economy was only able to generate a net increase in employment of 53 thousand over the two year recovery period. With labour force growth only showing modest declines, no ground was made in reducing the large stocks of the unemployed. Once the economy resumed more normal aggregate relationships, the stock of unemployment was trapped in this historical episode. The last thing that was required in this period was a move to tighter monetary and fiscal policy. Unfortunately, that is exactly what happened. The 25 year period of persistently high unemployment had begun.

Table 3 Components of employment growth on demand side, 1980s and 1990s

	% Δ GDP	% Δ EMP	% Δ QTW	% Δ LP
From Mar 1983				
4	7.42	1.56	0.03	5.74
8	12.00	5.18	5.75	0.69
12	16.82	9.33	6.55	0.28
16	19.60	11.49	4.33	2.82
From Sep 1991				
4	2.24	-0.22	-0.55	3.04
8	5.46	-0.23	0.16	5.54
12	12.03	3.17	1.16	7.34
16	15.99	7.55	0.87	6.92

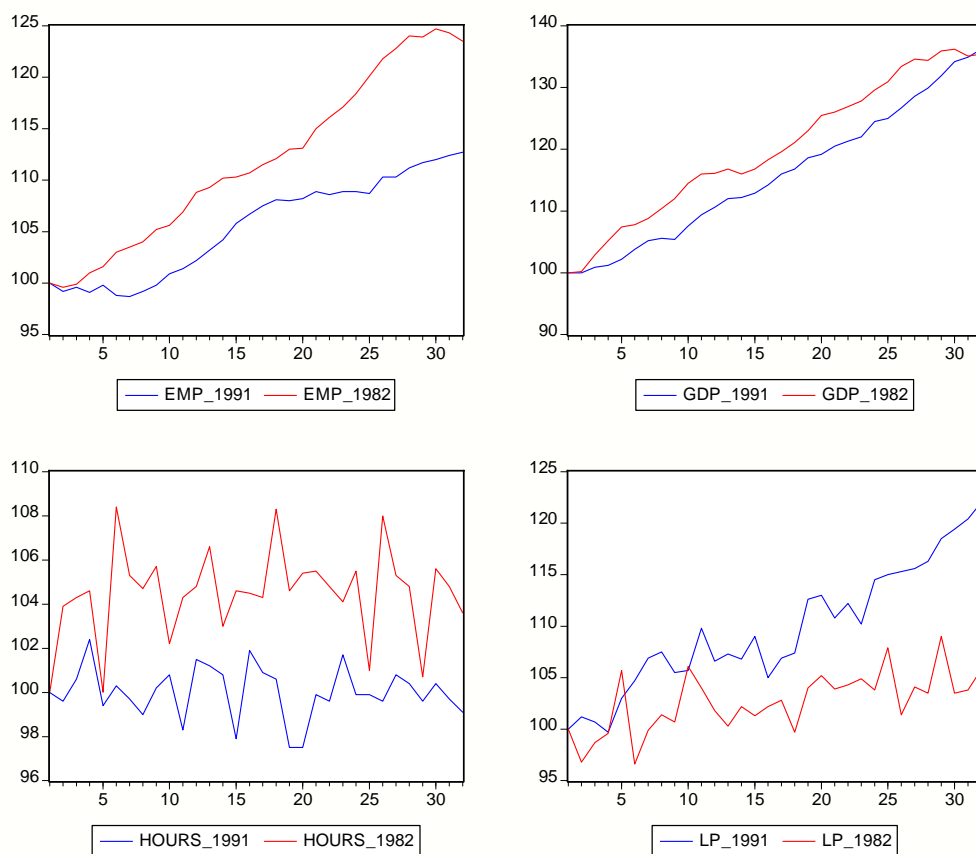
Source: Percentage changes between the recession troughs (March 1983 and September 1991) and various horizons in terms of quarters. The numbers do not add exactly to meet the relevant identity constraints. EMP is total employment, GDP is gross domestic product, QTW is quarterly total hours worked per person, and LP is labour productivity in hours.

In the first 4 years in to the 1990s recovery, both total hours worked and output grew more slowly than in the corresponding period for the 1980s recovery and labour productivity was almost 2.5 times more robust. As a result, the demand side contribution to employment growth in the 1990s recovery was weaker. GDP growth in 1992 was not able to offset productivity growth plus the modest hours effect and as a result the unemployment continued to rise. This is in contrast to the 1980s recovery where the output growth almost immediately added jobs. The growth phase leading out of the 1983 trough was quite different to this (and in many ways similar to the 1960s behaviour). In that recovery, strong GDP growth outstripped the strong labour force and labour productivity growth to generate an increasing employment rate. Little wonder the unemployment rate began to fall in this period.

Figure 8 presents the indexes for the demand components of employment growth for the 32 quarters following the respective GDP trough. Most of the trends shown in Figure 8 have been commented on in Section 2. The new pair-wise comparisons shown are for working hours and labour productivity. They clearly behaved in contrary ways in the recovery periods in the 1980s and 1990s. The lower labour productivity growth combined with stronger hours effect allowed employment to more than absorb the labour force growth in the 1980s.

In the same way that we decomposed the contribution to persons employed on the supply side, Table 4 reports the demand side decomposition into a GDP effect, an hours effect, and a labour productivity effect based on the approximate decomposition in Equation (5). In the 16 quarters from March 1983, GDP growth contributed almost an equivalent amount of jobs to the 16-quarter period following the September 1991 GDP trough. The 150 thousand less actual jobs created in the 1990s period is a consequence of the significantly higher productivity growth (attenuated by a modest expansion in intensity).

Figure 8 Labour demand aggregates, Australia 1980s and 1990s



Source: ABS Ausstats, March 1983=100 and September 1991 = 100, in respective panels

Table 4 Demand side accounting for changes in employment, thousands

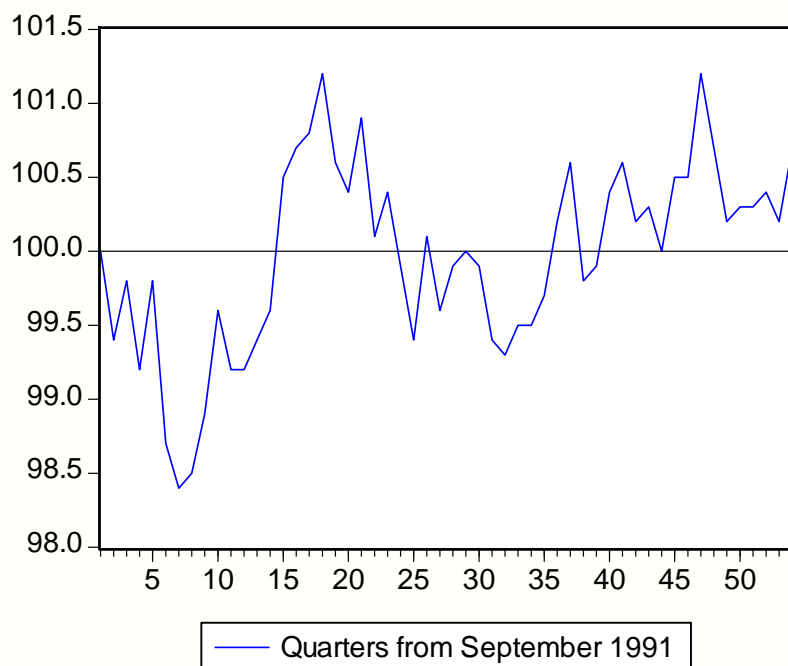
	GDP Effect	Hours Effect	Productivity Effect	Net Employment
From Mar 1983				
4	474.9	1.6	367.6	99.8
8	768.4	368.0	44.3	332.0
12	1076.9	419.6	17.9	597.3
16	1254.9	277.2	180.7	735.7
From Sep 1991				
4	174.7	-42.9	236.8	-17.4
8	424.9	12.3	431.2	-18.2
12	935.9	90.2	571.5	246.5
16	1244.0	67.4	538.3	587.6

Source: The base period is the respective recession troughs. Note the interactive effects between GDP, Hours, and Labour Productivity are assumed to be equal to zero and thus numbers in columns 2 to 4 do not add to column 5.

6. The recent growth cycle

In this section we briefly analysis the demand and supply behaviour over the entire period from September 1991 until now. The purpose of this analysis is to determine whether there have been major shifts in behaviour over this recovery in terms of factors contributing to the declining unemployment. As a result of the 13.5 year long recovery period (despite a one-quarter blip in December 2004), unemployment has slowly fallen and is now around 5.1 per cent (seasonally adjusted). In addition, long-term unemployment has also fallen significantly to 148.3 thousand in February 2005 (27.8 per cent of total unemployment) from its peak of 321.5 thousand in May 1993 (32.4 per cent of total unemployment). Mitchell and Bill (2005) examine whether the dynamic behaviour of long-term unemployment can be described as irreversible (meaning that it resists cyclical improvement and requires supply side remedies). One hypothesis supporting the irreversibility hypothesis is that long-term unemployment improvement is attributable to declining participation. Figure 9 provides no support for this proposition although there could be a specific cohort effect disguised by the aggregate data.

Figure 9 Labour force participation index, September 1991 = 100



Source: ABS Ausstats, September 1991 = 100.

Table 5 summarises the absolute percentage growth in demand and supply side components of employment growth to further highlight what has been going on in the economy since September 1991 with respect to the labour market aggregates. The data shows that 2.1 million jobs were added between September 1991-December 2004 and unemployment fell by only 250 thousand. Around 5/6 of the GDP growth was absorbed by labour force and labour productivity growth. GDP growth had to be significantly stronger than it was to provide for a return to full employment. Consequently, unemployment still hovers around 5 per cent. It would be much higher if participation had have growth more robustly. The change in hours worked also hides the two contrasting trends – significantly longer hours for some workers and

rising underemployment for other workers (now standing at around 3.5 per cent of the labour force (see latest CLMI, February 2005).

Table 5 Changes in demand and supply components, September 1991 to December 2004.

Aggregate indicator	Percent
% change in employment	26.5
% change in the working age population	20.4
% change in labour force participation	0.7
% change in the labour force	21.3
% change in GDP	61.2
% change in average quarterly hours worked	-1.7
% change in labour productivity	29.6
	000's
Change in employment	2065.0
Change in unemployment	-249.9

7. Conclusion

In this brief paper, we have decomposed the contributions of the demand and supply influences that combine to account for employment changes (and unemployment). We have noted that in the recent recovery phase the major problem appears to be inadequate GDP growth. The strong labour productivity growth over the course of the 1990s has provided for a recovery in real wages but has meant that GDP growth also had to be commensurately stronger if unemployment was to fall to true full employment levels.

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