Computing *FTE*

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

Hours-adjusted unemployment rate with hidden unemployment

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

$$\text{(A3.2)} \quad CU8 = \frac{PTE_{UH} + UN_{FT} + UN_{PT} + HU_{FT} + HU_{PT}}{FTE + PTE_{H} + PTE_{UH} + UN_{FT} + UN_{PT} + HU_{FT} + HU_{PT}}$$

where the additional terms are HU_{FT} the estimated discouraged workers who want to work full-time multiplied by the average full-time working hours; and HU_{PT} is the estimated number of discouraged workers who want to work part-time multiplied by the average part-time working hours. We used the proportions that apply to the official unemployed to allocate the estimated hidden unemployed between the two categories.

CHAPTER 4

Demographic and industry employment changes in a high pressure economy

William F. Mitchell

4.1 Introduction

In this Chapter we reassess some of the key propositions of the cyclical upgrading hypothesis, popularised by Arthur Okun and others in the 1960s and early 1970s, in the light of the vast changes that have occurred in the labour market over the last 20 years. The major strands of the upgrading hypothesis were discussed in Chapter 1. In Chapter 2, we considered the cyclical labour force participation effects and the implications of these for hidden unemployment. We found that the incidence of hidden unemployment was closely tied to the evolution of the business cycle and that significant upgrading effects from the rising participation in the labour market would accompany full employment. In this Chapter we extend this analysis and consider the likely changes to the industrial composition of employment and the age-gender composition of employment if the economy returned to a 2 per cent unemployment rate.

Specifically, two major questions are investigated:

- How is the total employment gap distributed across industries? By estimating the industry composition at full employment and relating it to several broad characteristics of the industries (like productivity performance, wage levels, proportion of full-time jobs, incidence of fringe benefit payments) we can conjecture whether upgrading effects are likely.
- What is the distribution of the extra jobs across the various demographic groups and industries? A shift-share analysis allows us to distinguish between the proportionate increases in demographic employment by industry and the extra jobs arising from increased shares in industry employment.

In contrast with Okun's upgrading mechanisms, Mitchell et al. (1995) examined an alternative cyclical adjustment path suggested by Thurow (1983). They concluded that the changing composition of total employment, with increasing numbers of workers being employed in sectors with low productivity levels and declining productivity growth rates, have been more influential in explaining the productivity slump observed over the last 20 years. The

conclusion suggests that in order to evaluate Okun's upgrading hypothesis we have to examine the changing composition of industry employment. In Australia and across the OECD economies generally, the low productivity service sector has been responsible for most of the growth in employment since the late 1970s. If two further related facts are added to the discussion, namely, that these industries (a) have higher part-time employment shares, and (b) larger female and teenage participation, then a less glamorous picture of upgrading emerges.

We should expect to see more jobs created in the service sector as the employment gap is closed. We should also expect teenagers and females to receive a significant number of these jobs. But whether we would want to construe this as a ladder-climbing shift is questionable. The new jobs are likely to be biased towards low-pay, fractional positions. Further, the effect on aggregate productivity as the composition of output and employment shifts further to these service industries, is likely to be less than desirable.

Section 4.2 estimates the cyclical responsiveness of employment for each industry and calculates the industry employment gaps. Section 4.3 estimates the cyclical responsiveness of the share of employment in each industry for 8 demographic groups: ages 15-19, 20-24, 25-54, and 55-64 for both male and females. The estimates facilitate a shift-share analysis, and the industry employment gaps are distributed in net terms across the demographic groups taking into account proportions and share shifts. Concluding remarks follow and suggest that the upgrading effects of full employment are less clear than in the early 1970s.

4.2 Industry employment gaps and cyclical elasticities

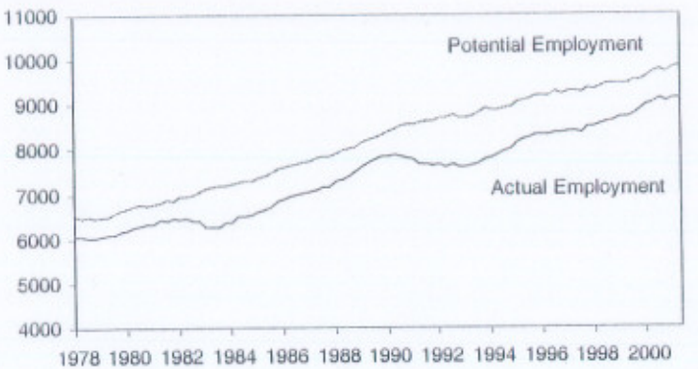
Figure 4.1 shows the evolution of potential and actual employment since 1978. The methodology used to compute potential employment is explained in the Appendix to Chapter 2. Potential total employment is defined as 98 per cent of potential total labour force using the 2 per cent unemployment rate as the full employment benchmark. Table 4.1 compares the major actual and potential aggregates for the February and May observations of 2001. In May 2001, the total employment gap was 728.2 thousand jobs (9837.9 minus 9109.7) and 'full employment' unemployment would be 196.8 thousand (2 per cent of the total potential labour force).

In which industries would the extra jobs be generated if the economy closed the employment gap? To calculate the employment gaps by industry, the following log-linear regression was estimated

$$(4.1) \qquad N_{it} = \beta_1 + \beta_2 TIME + \beta_3 N_{it-1} + \beta_4 N_t + \varepsilon_t$$

where *TIME* is a linear time trend included to distinguish cyclical forces from secular movements in the data; N_{it} is the i^{th} industry's employment at time t; N_t is total economy-wide employment at time t; and ε_t is a stochastic error term. We experimented with both a sector-specific trend term (*TIME*) and an economy-wide trend term (the part-time employment ratio) but the additional variable provided no meaningful extra information (Burgess, Mitchell and Watts, 2000). The long-run elasticities are calculated as $\beta^* = \beta_4 / (1 - \beta_3)$. All the equations were satisfactory in terms of the standard diagnostic criteria.[1]

Figure 4.1 Actual and potential employment, Australia, 1978-2001 (thousands)



Source: ABS, The Labour Force, Australia, 6203.0 and author's calculations. See the Appendix to Chapter 2 for an explanation of the derivation of the potential employment series.

Table 4.1 Major actual and potential labour force aggregates, Australia, 2001 (thousands)

	Actual			Potential		
	Labour Force	Employment	Unemployment	Labour Force	Employment	Unemployment
Feb-01	9764.0	9098.6	665.4	9978.7	9783.0	195.7
May-01	9806.0	9109.7	696.3	10034.6	9837.9	196.8

Source: see Figure 1.

Table 4.2 shows the estimated elasticities for each industry. Inertia is β_3, short-run is β_4, and trend is β_2. The β^* estimates clearly indicate the divergent cyclical sensitivities of the sectoral employment levels to changes in total employment. A value above unity indicates that employment in that industry

increases disproportionately as total employment rises. A value below unity indicates a less than proportionate response by that industry's employment to total employment expansion. A negative value indicates a counter-cyclical response. Finance and Insurance is the most cyclically sensitive industry (employment increases by 2.41 per cent for every one per cent increase in aggregate employment). Other highly sensitive industries ($\beta^* > 1$) are Construction (1.81); Accommodation, Cafes, and Restaurants (1.63); Wholesale Trade (1.55); Communications (1.53); Property and Business Services (1.35), and Mining (1.06). It is in these industries that the bulk of the employment growth would be found. Only Electricity, Gas and Water exhibits counter-cyclical behaviour.

Table 4.2 Estimated employment elasticities by industry, Australia, 1984-2001

Industry	Inertia Elasticity β^3	Short-run Elasticity β^4	Long Run Elasticity β^*	Trend β^2
Agriculture, Forestry and Fishing	0.45	0.47	0.85	-0.002
Mining	0.45	0.58	1.06	-0.005
Manufacturing	0.81	0.17	0.89	-0.001
Electricity, Gas and Water	0.73	-0.11	-0.43	-0.004
Construction	0.72	0.51	1.81	-0.001
Wholesale Trade	0.68	0.50	1.55	-0.001
Retail Trade	0.33	0.74	1.11	0.001
Accommodation, Cafes and Restaurants	0.80	0.32	1.63	0.001
Transport and Storage	0.68	0.22	0.68	0.000
Communications	0.81	0.29	1.53	-0.001
Finance and Insurance	0.72	0.68	2.41	-0.003
Property and Business Services	0.71	0.39	1.35	0.002
Government Administration and Defence	0.80	0.08	0.41	0.000
Education	0.70	0.16	0.52	0.001
Health and Community Services	0.50	0.36	0.71	0.002
Cultural and Recreational Services	0.48	0.41	0.79	0.003
Personal and Other Services	0.62	0.24	0.64	0.002

Source: Author's calculations.

Converting these elasticities into gap estimates is straightforward. First, the total gap is expressed as a percentage of actual total employment. This figure represents the percentage change in total actual employment that would be required to instantly eliminate the gap. From Table 4.1, in May 2001, total employment would have to be 7.994 per cent higher to close the gap of 728.2 thousand jobs. If employment was to (suddenly) grow by this amount, the aggregate unemployment rate (taking into account cyclical participation movements) would be equal to 2 per cent, our assumed full employment level of activity.[2]

Second, the gap for each industry is initially estimated by multiplying β^* by 7.994 per cent by the current industry employment shown in Table 4.3. For example, for Manufacturing in May 2001, the gap calculation is 0.89 times 0.07994 times actual employment in manufacturing of 1123.0 thousand. This gives an initial gap of 79.9 thousand. Due to the stochastic nature of the modelling the estimated industry gaps do not exactly equal the total gap of 728.2 thousand. The second round allocation involved distributing the residual across industries in accordance with each industry's gap as a percentage of the total first round gap distribution.

Table 4.3 reports the employment by industry and the distributed employment gaps as at May 2001. The gaps are clearly a product of the current distribution of employment and the cyclical sensitivity of industry employment. Retail trade (15.1 per cent of the total gap), Property and Business Services (14.5 per cent), Construction (12.2 per cent) and Manufacturing (10.1 per cent) are the major components of the total gap, accounting for around 52 per cent of all the jobs which would be created if the economy moved to full employment. Other significant job creating industries are Finance and Insurance (8.6 per cent), Accommodation, Cafes and Restaurants (7.5 per cent), Wholesale trade (6.7 per cent), and Health and Community Services (6.5 per cent). As a group these industries account for 81.8 per cent of the total gap. Although Construction is a relatively small industry (7.4 per cent of actual total May 2001 employment) it is so cyclically sensitive that it accounts for 12.2 per cent of the total gap. Manufacturing is the opposite. Being only moderately sensitive ($\beta^*= 0.89$), it generates a relatively large employment gap (10.1 per cent of the total gap) because it is a relatively large employer *per se* (12.3 per cent of total May 2001 employment).

Table 4.4 (at the end of the Chapter) ranks the industries in descending order by their employment gaps and provides a range of broader industry characteristics. The data allow us to speculate on the types of jobs that might be created if the economy closed each of the industry employment gaps. The indexes are computed by expressing the raw value for each individual industry as a percentage of the corresponding All Industry value. To simplify the discussion, we divide the industries into High Gap (gaps > 40 thousand), Medium Gap (20 < gaps < 40), and Low Gap (gaps < 20). To help in our interpretation, Table 4.5 shows the simple correlations between the industry employment gaps and the broader measures of industry characteristics. We can

summarise the results in the following manner noting that the data is primarily as at May 2001 unless otherwise denoted.

Table 4.3 Industry employment gaps, Australia, May 2001

Industry	GAP		ACTUAL	
	(000's)	% of Total	(000's)	% of Total
Agriculture, Forestry and Fishing	26.9	3.7	432.2	4.7
Mining	6.0	0.8	77.8	0.9
Manufacturing	73.4	10.1	1123.0	12.3
Electricity, Gas and Water	-2.0	-0 3	65.3	0.7
Construction	88.8	12.2	669.7	7.4
Wholesale Trade	48.5	6.7	425.9	4.7
Retail Trade	110.1	15.1	1354.0	14.9
Accom. Cafes and Restaurants	54.8	7.5	458.0	5.0
Transport and Storage	20.8	2.9	419.5	4.6
Communications	21.1	2.9	187.6	2.1
Finance and Insurance	62.5	8.6	353.8	3.9
Property and Business Services	105.5	14.5	1067.7	11.7
Govt Administration and Defence	11.2	1.5	371.8	4.1
Education	23.6	3.2	615.8	6.8
Health and Community Services	47.0	6.5	905.1	9.9
Cultural and Recreational Services	13.0	1.8	222.2	2.4
Personal and Other Services	16.9	2.3	360.3	4.0
TOTAL	728.2	100.0	9109.7	100.0

Source: ABS, *The Labour Force*, Australia, Cat. No. 6203.0 and author's calculations.

First, the proportion of prime-age males (25-54 years) in an industry may indicate the stability of employment although this traditional relationship is now more tenuous as a result of changing households and family structures. While prime-age male employment accounted for 42.6 per cent of total employment in February 1978, it has steadily declined since that time and by May 2001, it stood at 39.6 per cent of All Industry employment. Burgess, Mitchell and Watts (2000) show that there have been significant declines in the prime-age male proportions in several of the High Gap industries – Construction, Accommodation, Cafes and Restaurants, Retail Trade, and Property and Business Services. There appears to be a dichotomy among the High Gap industries (eight in all) with four of the five lowest prime-age ratio industries being represented. Retail trade (26.1 per cent of total employment being prime-age male), Accommodation, Cafes and Restaurants (25.4 per cent), Finance and Insurance (35 per cent), and Health and Community Services (16.1 per cent) are well below the All Industry prime-age male representation. On the other hand, Manufacturing (55.7 per cent), Construction (64.4 per cent), and Wholesale trade (51.2 per cent) have strong prime-age male representation in their total employment. In general, prime-age males do not dominate the High Gap industries. If each industry filled its May 2001 employment gap with an unchanged demographic composition of industry employment, prime-age males would have filled 289.6 thousand of the extra 728.2 thousand jobs. We show in the next section that the shift effects are predominantly negative for this demographic group.

Table 4.5 Correlations between industry employment gaps and broader industry characteristics

	Gap	Full-time %	LP Index	AWE Index	PA Index	FB Index	TU Index
Employment Gap	1.00						
Full-time as % total	-0.31	1.00					
Labour Prod. Index	-0.46	0.64	1.00				
AWE Index	-0.45	0.86	0.88	1.00			
Prime-age Index	-0.29	0.88	0.68	0.79	1.00		
Fringe Benefits Index	-0.33	0.74	0.57	0.80	0.48	1.00	
TU Index	-0.52	0.45	0.46	0.52	0.33	0.68	1.00

Source: see Table 4.4.

Second, the fringe-benefits index was derived from the annual ABS *Employee Earnings, Benefits, and Trade Union Membership* publication (Cat. No. 6310, August 2000), and is based on the table covering the proportion of employees receiving standard benefits, including superannuation, sickness benefits, holiday pay, and long-service leave. In the absence of more detailed data on fringe-benefits and other non-wage benefits, this column is a (very) proximate measure of the degree of long-term attachment between employers and employees. Labour market theory suggests that primary labour market jobs typically reward their incumbents with above-average earnings, which are supplemented by above-average fringe benefits. In addition, employers must also pay higher fixed costs of hiring and firing and related employment costs in these areas. The benefit to them is that they gain a skilled and stable labour force. Put together, a motivation exists on both sides of the bargain to preserve the relationship. The homogeneity of the index indicates their standard nature. In that sense, a value below 100.0 may indicate poorly developed primary labour market characteristics. The evidence is mixed. The High Gap industries contain two sectors (Retail Trade and Accommodation, Cafes, and Restaurants), which have

the lowest proportions of employees receiving these benefits but in general the industries in this group are slightly better than average. For Finance and Insurance (the highest relative to average) above-average superannuation is significant.

Third, the pattern is also unclear when it comes to the pay characteristics of the High Gap industries as measured by the comparison of Average Weekly Earnings (AWE) in each industry to the All Industries AWE (ABS *Average Weekly Earnings*, Cat. No. 6302.0, November 2000). The two lowest paid industries (Retail Trade and Accommodation, Cafes, and Restaurants) are among the High Gap industries but overall only around 37 per cent of the jobs created would go to below average pay industries. Only one of the top six paying industries is included in the High Gap group. However, it cannot be concluded from this that the newly created jobs will necessarily pay above the All Industries average (for further evidence showing that the newly created jobs are likely to be below average paying jobs, see Mitchell *et al.*, 1995).

Fourth, there are no available labour productivity (output per person hour) estimates for the level of industry aggregation required. We computed the Gross Industry Value Added at basic prices (excluding dwelling ownership) divided by total employment. Around 86 per cent of the gap is located in industries where productivity is below the All Industries average. There is thus no evidence that a move back to full employment will generate major productivity increases on a national level. This is clearly a different story from that found in the USA by Okun (1973) where a productivity bonus was one of the important elements of the submerged iceberg.

Fifth, the Trade Union membership index (from ABS *Employee Earnings, Benefits, and Trade Union Membership*, Cat. No. 6310, August 2000) suggests that most of the jobs from the High Gap group of industries will be in industries with low to very low levels of unionisation. Carlson, Mitchell and Watts (2001) show that the workers who allowed their unions to collectively bargain wage outcomes, enjoyed superior wages growth in recent years.

Sixth, in the context of the high levels of underemployment discussed in Chapter 3, it is important to consider how much full-time employment would accompany the closure of the total employment gap. The full-time to total employment ratio for each industry is expressed in percentage rather than index terms. The All Industry average shows that 72.4 per cent of all employment is full-time. The High Gap industries are spread between those with above-average full-time employment shares and those which have very low shares of full-time employment. Once again these indicators present a mixed story.

From this evidence, can we draw any conclusions about the types of jobs that might be created if the employment gap were to be closed? There is no sure way of knowing or estimating the types of jobs which might be created. The analysis above is in terms of industry-wide characteristics. The results taken together do

not unambiguously accord with the earlier American work by Okun (1973). While an examination of broad industry characteristics does not allow us to be sure about the types of jobs that would be created, it would seem that the substantial upgrading effects (higher wages, higher productivity, more primary labour market jobs) found in the earlier studies are not found in this work. According to this analysis, the bulk of the extra employment would go to, at best, average productivity industries, paying below average weekly wages with no clear superiority in fringe benefits. Further, the jobs would be likely to increase the ratio of part-time to total employment, other things being equal.

4.3 Estimating the cyclical sensitivity of demographic employment shares

An important component of the upgrading hypothesis is that the demographic composition of industry employment should vary with the level of economic activity and in an upturn provide disproportionately more jobs to the disadvantaged demographic groups (teenagers and females). While the other aspects of the upgrading hypothesis do not seem clear cut in the present study, it remains to be seen whether upgrading opportunities for women (and other less advantaged groups in the labour market) arise from changes in the demographic composition of industry employment.

Thus, in this section we estimate which demographic groups would gain the extra jobs if the total employment gap was closed? To estimate the cyclical responsiveness of demographic employment shares ABS data for employment by industry by age and gender was used. To simplify the analysis, four broad age groups were used for each gender: 15-19, 20-24, 25-54 (prime-age), and 55-64 years. All data was seasonally adjusted.

The following regression framework was estimated as the basis of our calculations:

$$(4.2) \qquad \left(N_{ij}/N_i\right)_t = \alpha_0 + \alpha_1 TIME + \alpha_2 \left(GAP/N\right)_t + \varepsilon_t$$

where N_{ij} is the employment of the j^{th} group in industry i; N_i is total employment in industry i; *TIME* is a linear time trend intended to decompose sectoral factors and cyclical factors; and (*GAP/N*) is the Total All Industry employment gap to total employment ratio.

For each industry, the eight demographic employment share equations constitute a system with interesting properties not unlike those found in cost or expenditure share equations. First, the sum of the shares (the dependent variables) is always unity and thus only seven of the eight equations are linearly independent. This means that the residual covariance matrix is singular given that for each observation, the residuals sum to zero across the equations. Second, the sum of the share shift coefficients has to be zero ($\Sigma\, \alpha_2 = 0$). This

imposes strong constraints on the sum of the remaining coefficients over time. Third, the appropriate way of dealing with the singularity is to drop one of the equations and estimate the α_2 coefficient from the dropped equation indirectly by imposing the constraints that the share shifts have to sum to zero. Barten (1969) showed that under multivariate normality, if Maximum Likelihood estimation is applied to the n-1 share equations, the log-likelihood values and estimated standard errors will not be sensitive to the choice of which equation we drop. In strict terms, normality is untenable because the shares are restricted to the [0, 1] interval. However, as long as the observed shares are not on the boundaries of the interval this will, in practice, not be a significant problem. Further, given that the regressors are identical, Normal-MLE and Seemingly Unrelated Regression will generate identical estimates to OLS. The industry systems were all estimated using ML estimation with the female 55-64 equation being dropped in each case.

The coefficient α_2 measures the cyclical sensitivity of a specific demographic industry employment share. If the value of $\alpha_2 > 0$, then the demographic employment share in that industry decreases when the employment gap decreases and the share of that group in that industry's employment is maximised when the gap is maximised. These demographic groups experience their largest employment share when the economy is at its lowest ebb. If $\alpha_2 = 0$, the demographic employment share in question is not cyclically sensitive. Accordingly, the number of jobs that would be received by these groups in an expansion is in proportion to their current share in total industry employment. When $\alpha_2 < 0$, the specific demographic group's employment share in the relevant industry increases when the employment gap decreases. These groups thus experience increasing employment shares as economic activity expands.

Table 4.6 reports the estimates of α_2 for each demographic group by industry. It is clear that teenage males and females benefit from increasing employment share in all industries to varying degrees. Prime-age males lose share in all industries except for Education and Personal and Other Services whereas prime-age females lose share in all but Mining, Accommodation, Cafes, and Restaurants, and Transport and Storage. In general, the 55-64 age groups for both males and females experience increasing employment shares in most industries. Results across industries are less clear for the 20-24 year-old groups for both genders.

Table 4.6 Coefficients measuring cyclical sensitivity of demographic employment shares

IND	Males				Females			
	15-19	20-24	25-54	55-64	15-19	20-24	25-54	55-64
AGR	-0.1010	-0.0755	0.0698	0.0405	-0.0382	-0.0576	0.1530	0.0089
MIN	-0.0308	-0.0358	0.2311	0.0045	-0.0036	-0.0201	-0.1430	-0.0022
MAN	-0.1209	0.0732	0.1133	-0.1275	-0.0436	0.0454	0.0921	-0.0320
EGW	-0.0556	0.0359	0.2531	-0.3044	-0.0892	-0.0378	0.2369	-0.0390
CON	-0.1767	0.0069	0.0527	-0.0144	-0.0037	-0.0014	0.1341	0.0026
WHO	-0.1355	0.0042	0.2135	-0.1500	-0.0998	-0.0074	0.2022	-0.0273
RET	-0.2065	0.0969	0.1872	0.0095	-0.1637	0.0339	0.0858	-0.0430
ACR	-0.0729	0.1570	0.0026	-0.0566	-0.1352	0.2188	-0.1262	0.0125
T&S	-0.1206	-0.0141	0.3359	-0.1483	-0.0501	0.0348	-0.0188	-0.0189
COM	-0.0913	-0.2138	0.4494	-0.2593	-0.1026	-0.0346	0.3174	-0.0652
F&I	-0.1928	0.1246	0.0883	-0.0780	-0.4644	0.3002	0.2624	-0.0403
PBS	-0.0684	-0.0685	0.3507	-0.0857	-0.1695	-0.0230	0.1146	-0.0502
GAD	-0.0244	0.0272	0.2745	-0.1032	-0.1097	-0.0649	0.0212	-0.0208
EDU	-0.0129	0.0136	-0.0403	-0.0293	-0.0186	-0.0317	0.1622	-0.0429
HCS	-0.0206	0.0243	0.0699	-0.0246	-0.1090	0.0198	0.1353	-0.0953
CRS	-0.1367	-0.0856	0.0025	-0.0641	-0.0834	0.0844	0.3611	-0.0782
POS	-0.0610	-0.0004	-0.0263	-0.0128	-0.2798	0.0971	0.2743	0.0089

Source: Author's calculations.

Table 4.7 (at the end of the Chapter) shows the results of the shift-share distribution of the industry employment gaps across the eight demographic groups analysed (ages 15-19, 20-24, 25-54, and 55-64 for males and females). For each industry, three figures are reported for each demographic group. First, the row denoted *Share* measures the 'share' or 'scale' effect which would result if each industry closed its May 2001 employment gap and allocated the extra jobs across these demographic groups in accordance with their May 2001 employment share in each industry. For example, 25-54 year old males employed in manufacturing accounted for 56.2 per cent of total manufacturing employment and would have received 41.3 thousand of the 73.4 thousand jobs created if the manufacturing employment gap was eliminated. Second, the row denoted *Shift* shows the 'shift' effect or the upgrading movements that occur when the economy operates at higher levels of activity. A positive shift effect for a demographic group means that as the stronger economy creates more jobs it also changes the composition of employment in favour of that particular group. The estimates in the *Shift* row are calculated by multiplying the α_2

coefficient for the relevant demographic industry pair by total employment in that industry in May 2001 times the negative of the employment gap for May 2001. For example, if demographic shares were constant, 25-54 year-old males would receive 28.3 thousand jobs of the 110.1 thousand created in Retail Trade. Computing the shift effect – the α_2 coefficient (from Table 4.6) 0.1872 times 1,321 thousand (seasonally adjusted employment in May 2001) times -0.079924 (the total economy employment gap in May 2001) gives -3.8 thousand. Thus prime-age males would lose share and end up with an extra net 24.5 thousand jobs in the Retail Trade industry. So prime-age males lose some of their share in this industry to other demographic groups, principally teenage males and females and older females.

Table 4.8 summarises the gross shift and share effects from Table 4.7. We see there is considerable cyclical sensitivity in the demographic employment shares across industries. All groups share in the 728.2 thousand-job expansion. Teenage females (total shift effect of 59.8 thousand), teenage males (49.6 thousand), older males (42.8 thousand), and older females (15.9 thousand) are the demographic groups which gain through favourable shift effects. The other groups all lose shares, with prime-age males being the worst hit with a share loss equivalent to 80 thousand jobs. Prime-age females also lose a significant number of jobs (69 thousand) as their overall share in industry employment declines.

Table 4.8 Summary shift and share effects by demographic group (thousands)

Effect	Males				Females				Total
	15-19	20-24	25-54	55-64	15-19	20-24	25-54	55-64	All
Share	27.9	42.7	289.8	39.3	27.4	39.7	235.4	26.1	728.2
Shift	49.6	-2.1	-80.0	42.8	59.8	-16.9	-69.0	15.9	0.0
Total	77.4	40.6	209.7	82.0	87.2	22.8	166.4	42.0	728.2

Source: Author's calculations.

Apart from the counter-cyclical industry (Electricity, gas and water), prime-age males also leave Mining, Communications, and Property and Business Services. Communications is a high elasticity industry with high pay and high productivity, slightly above-average standard benefits, and above-average full-time shares. However, its actual employment gap is small and so the traditional upgrading opportunities (from low pay to high pay, etc.) which would go to teenagers and older males, are trivial in this case. Property and Business Services is much closer to the All Industry average but has a substantial employment gap. Therefore, these modest benefits arising from an expansion would be enjoyed by younger and older males and females. However, there would not be an economy-wide productivity bonus arising in this case.

The overall evidence on upgrading is unclear. Teenage males and females gain in all industries. Of particular note is that both enjoy substantial share movements in Finance and Insurance, a relatively high paying and high productivity industry. However, they would also gain substantial numbers of jobs in Retail Trade, which does not carry the upgrading connotation. Older males and to a lesser extent older females, also enjoy increased shares in higher paying industries. Whether the increased employment they actually gain has the average characteristics for the particular industries is moot.

4.4 Conclusion

The results have shown that the upgrading thesis has to be questioned. There is no guarantee that an employment recovery would be accompanied by a preponderance of better paid and higher productivity jobs. There is evidence that a recovery would produce a significant number of low productivity and low paid jobs. The projections accord with the explanation for the slowdown in productivity since the mid-1970s based on increasing shares in output of low productivity service industries. With more jobs projected to be created in the service sector than the goods producing sector, this trend towards lower productivity growth is likely to continue.

The principle source of upgrading comes from the changing demographic composition of industry employment. It is estimated that in many industries, the employment shares of teenagers and older workers increase as the total employment gap is closed. In other words, these groups gain a larger share of the extra jobs than their current share in industry employment would predict. Prime-age males and females lose shares in most industries.

The results also suggest that the ratio of part-time to full-time employment will increase as the aggregate employment gap is closed. In other words, more low-paying, low-productivity and fractional jobs, particularly for women, are predicted to be created. There appears to be a long term increase in the incidence of female part-time employment across industries and occupations, which has been accompanied by an increase in the percentages of both part-time males and females who are seeking more hours of work. Part-time employment tends to be insecure and disadvantaged, an issue examined further in Chapter 8.

Notes

[1] The complete results are available on request from the author.

[2] The choice of a 2 per cent unemployment rate to represent full employment is in line with the hidden unemployment estimates. No convincing evidence exists to assume that the economy is incapable of reaching this target (see Mitchell, 1987b).

Table 4.4 Summary characteristics of industry and the employment gaps

	GAP ('000) May 2001	GAP % of Total May 2001	Elasticity β^* May 2001	Emp. % of Total May 2001	FT % of Total May 2001	LP Index 2000	AWE Index Nov 2000	Prime -age Index May 2001	Fringe Bens. Index Aug 2000	TU M'ship Index Aug 2000
HIGH GAP INDUSTRIES										
Retail Trade	110.1	15.1	1.11	14.9	53.9	40.4	61.1	65.9	87.2	71.7
Property and Business Serv.	105.5	14.5	1.35	11.7	74.6	94.2	108.8	100.1	100.7	31.6
Construction	88.8	12.2	1.81	7.4	85.7	61.0	114.9	162.4	99.8	106.9
Manufacturing	73.4	10.1	0.89	12.3	89.1	85.0	115.6	140.5	105.9	125.9
Finance and Insurance	62.5	8.6	2.41	3.9	80.9	158.6	128.2	88.4	106.5	98.4
Accomm. Cafes and Rests	54.8	7.5	1.63	5.0	50.7	49.8	60.7	64.0	88.2	41.7
Wholesale Trade	48.5	6.7	1.55	4.7	83.8	92.2	110.0	129.1	105.0	42.1
Health and Comm. Services	47.0	6.5	0.71	9.9	58.2	66.7	93.0	41.0	104.2	130.8
MEDIUM GAP INDUSTRIES										
Ag, Forestry and Fishing	26.9	3.7	0.85	4.7	75.7	51.2	na	103.9	89.6	21.9
Education	23.6	3.2	0.52	6.8	66.6	67.2	104.4	63.8	105.0	178.1
Communications	21.1	2.9	1.53	2.1	87.3	145.1	137.2	145.5	105.1	152.6
Transport and Storage	20.8	2.9	0.68	4.6	82.5	95.4	123.2	148.2	102.2	147.4
LOW GAP INDUSTRIES										
Personal and Other Services	16.9	2.3	0.64	4.0	71.6	64.3	98.9	99.8	98.8	112.1
Cultural and Rec. Services	13.0	1.8	0.79	2.4	60.4	86.1	71.5	93.5	90.9	69.2
Gov. Admin. and Defence	11.2	1.5	0.41	4.1	84.0	100.8	121.7	104.9	107.6	154.3
Mining	6.0	0.8	1.06	0.9	94.7	414.1	211.5	197.4	108.9	130.8
Electricity, Gas and Water	-2.0	-0.3	-0.43	0.7	96.6	328.3	158.1	170.7	109.1	215.0
TOTAL	728.2	100.0		100.0	72.4	100.0	100.0	100.0	100.0	100.0

Source: Author's calculations.

Table 4.7 Demographic allocations of industry employment gaps, May 2001

Age-Gender		AGR	MIN	MAN	EGW	CON	WHO	RET	ACR	T&S	COM	F&I	GAD	PBS	EDU	HCS	CRS	POS	ALL
	GAPS	26.9	6.0	73.4	-2.0	88.8	48.5	110.1	54.8	20.8	21.1	62.5	105.5	11.2	23.6	47.0	13.0	16.9	728.2
MALE																			
15-19	Share	1.3	0.1	2.3	0.0	4.5	1.4	12.2	4.0	0.3	0.1	0.2	1.8	0.1	0.2	0.2	0.8	0.3	27.9
	Shift	3.1	0.9	3.7	1.7	5.4	4.1	6.3	2.2	3.7	2.8	5.9	2.1	0.7	0.4	0.6	4.2	1.9	49.6
	Total	4.3	1.0	6.0	1.7	9.9	5.5	18.5	6.2	4.0	2.9	6.1	3.9	0.8	0.6	0.8	5.0	2.2	77.4
20-24	Share	1.8	0.2	5.6	-0.1	8.8	3.6	8.3	5.0	1.0	1.3	2.3	6.1	0.3	0.5	0.9	0.8	0.6	42.7
	Shift	2.3	1.1	-2.2	-1.1	-0.2	-0.1	-3.0	-4.8	0.4	6.5	-3.8	2.1	-0.8	-0.4	-0.7	2.6	0.0	-2.1
	Total	4.1	1.3	3.4	-1.2	8.6	3.5	5.4	0.2	1.5	7.8	-1.5	8.1	-0.5	0.1	0.2	3.4	0.6	40.6
25-54	Share	12.0	4.7	41.3	-1.4	57.5	25.1	28.3	13.8	12.3	12.2	22.0	42.0	4.7	5.8	7.5	4.8	6.7	289.8
	Shift	-2.1	-7.0	-3.5	-7.7	-1.6	-6.5	-5.7	-0.1	-10.2	-13.7	-2.7	-10.7	-8.4	1.2	-2.1	-0.1	0.8	-80.0
	Total	9.9	-2.3	37.8	-9.1	55.9	18.6	22.6	13.7	2.1	-1.5	19.3	31.3	-3.7	7.0	5.4	4.7	7.5	209.7
55-64	Share	3.1	0.2	4.9	-0.2	7.0	3.7	4.0	1.6	1.7	1.0	1.8	6.3	0.7	0.9	1.3	0.5	0.7	39.3
	Shift	-1.2	-0.1	3.9	9.3	0.4	4.6	-0.3	1.7	4.5	7.9	2.4	2.6	3.1	0.9	0.7	2.0	0.4	42.8
	Total	1.9	0.1	8.8	9.1	7.4	8.3	3.7	3.3	6.3	8.9	4.2	8.9	3.8	1.8	2.1	2.4	1.1	82.0
FEMALE																			
15-19	Share	0.4	0.0	0.5	0.0	0.3	0.3	15.6	4.2	0.2	0.3	1.3	2.3	0.1	0.2	1.1	0.7	0.9	27.4
	Shift	1.2	0.1	1.3	2.7	0.1	3.0	5.0	4.1	1.5	3.1	14.1	5.2	3.3	0.6	3.3	2.5	8.5	59.8
	Total	1.6	0.1	1.8	2.7	0.4	3.4	20.6	8.4	1.7	3.5	15.4	7.4	3.4	0.7	4.4	3.2	9.4	87.2
20-24	Share	0.5	0.1	1.9	0.0	1.0	1.8	9.5	5.5	0.7	0.8	5.2	6.5	0.4	1.3	3.3	1.0	1.3	39.7
	Shift	1.8	0.6	-1.4	1.2	0.0	0.2	-1.0	-6.7	-1.1	1.1	-9.1	0.7	2.0	1.0	-0.6	-2.6	-3.0	-16.9
	Total	2.2	0.7	0.5	1.1	1.0	2.1	8.5	-1.2	-0.3	1.9	-3.9	7.2	2.4	2.2	2.7	-1.6	-1.6	22.8
25-54	Share	6.3	0.6	15.4	-0.3	8.8	11.5	28.8	18.5	4.1	5.1	28.5	36.8	4.6	13.0	28.9	4.1	5.9	235.4
	Shift	-4.7	4.4	-2.8	-7.2	-4.1	-6.2	-2.6	3.8	0.6	-9.7	-8.0	-3.5	-0.6	-4.9	-4.1	-11.0	-8.4	-69.0
	Total	1.6	5.0	12.6	-7.5	4.7	5.4	26.2	22.4	4.7	-4.6	20.5	33.3	4.0	8.0	24.7	-6.9	-2.5	166.4
55-64	Share	1.6	0.1	1.5	0.0	1.0	1.0	3.2	2.2	0.4	0.2	1.3	3.8	0.3	1.8	3.9	0.4	0.5	26.1
	Shift	-0.3	0.1	1.0	1.2	-0.1	0.8	1.3	-0.4	0.6	2.0	1.2	1.5	0.6	1.3	2.9	2.4	-0.3	15.9
	Total	1.3	0.1	2.5	1.2	0.9	1.9	4.6	1.8	0.9	2.2	2.5	5.3	0.9	3.1	6.8	2.7	0.2	42.0
TOTAL	Share	26.9	6.0	73.4	-2.0	88.8	48.5	110.1	54.8	20.8	21.1	62.5	105.5	11.2	23.6	47.0	13.0	16.9	728.2
	Shift	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total	26.9	6.0	73.4	-2.0	88.8	48.5	110.1	54.8	20.8	21.1	62.5	105.5	11.2	23.6	47.0	13.0	16.9	728.2

Source: Author's calculations.