Female Earnings in 1981 and 1991: A Comparison.

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Abstract

This paper provides a detailed and comprehensive examination of female relative earnings over the period 1981 to 1991. Comparisons are made with male estimates. The data are disaggregated by sector of employment, revealing important and differing underlying trends. In the public sector, for example, the return to education fell for both males and females. In the private sector there was a rise in the relative earnings of female high school and diploma graduates, and a decline amongst female degree holders. Private sector male degree holders experienced an increase in their relative earnings.

I Introduction

Much has been written on the male wage structure in Australia. We know, for example that: males earn around 14 per cent more than females; males from English speaking countries earn around 3 per cent more than their Australian born counterparts; married males earn around 12 per cent more than males who have never married; and structural factors (specifically sector, industry and occupation of employment) are important determinants of male earnings (for a detailed review of the literature see Preston 1997).

Much less is known, or reported, about the female wage structure in Australia. In studies employing wage equations the emphasis is predominantly on males (e.g. Borland and Suen, 1990; Chiswick and Miller, 1985 and 1995; Hatton and Chapman, 1989; McNabb and Richardson, 1989; Tran-Nam and Nevile, 1988; and Nevile and Saunders, 1998). The exception, of course, are studies of the gender wage gap (e.g. Gregory and Daly, 1992; Chapman and Mulvey, 1986; Kidd and Viney, 1991; Rummery, 1992; and Langford, 1995). However, the use of different data sets, models and time frames makes it difficult to comprehensively assess and comment on the determinants of female earnings and how they have changed over time. Miller and Mulvey (1996) probably provide the most current insight as to the determinants of female earnings[1]. The emphasis in their paper is, however, on unions and firm size. Thus, apart from reporting the full-set of female coefficient estimates, little discussion is given to the wage structures (aside from the union and firm size effects).

In this paper overcome this gap in the literature and provide a detailed analysis of the female relative earnings over the period 1981 to 1991. Comparisons may be made with male estimates in Preston (1997). The remainder of the paper is structured as follows: Section II briefly outlines the human capital model. Section III discusses the data and estimation method.

[1] Miller and Mulvey (1996)use the 1993 *Survey of Training and Education*.

Section IV examines the effects of human capital endowments and demographic characteristics on earnings. Section V reports on the role and importance of structural factors. Section VI provides a summary and conclusion.

II The Human Capital Model

The standard human capital earnings function to explain variation across individuals in the acquisition of earnings power, as first derived by Mincer (1974), may be stated as follows:

$$\ln Y_{it} = \beta_0 + \beta_1 S_i + \beta_2 X_{it} + \beta_3 X_{it}^2 + u_{it} \qquad (1)$$

Where:
Y_{it} = actual earnings of individual i in year t;
S_i = years of schooling, assumed to be constant in the post-school or labour market period;
X_{it} = years of potential labour market experience (defined as age-S-5) of individual i in year t;
u_{it} = stochastic error term.

When applied to cross-sectional data the parameter β_0 provides an estimate of the earnings capacity for a person with zero schooling or labour market experience; β_1 provides an estimate of the rate of return to schooling (assumed to be constant in this model); β_2 and β_3 depend on the initial investment ratio when work commences, the rate of return to post-school investments, and the rate at which the human capital investment ratio declines with accumulated years of labour market experience.

The model is not without its critics (see Blinder, 1976). Amongst other things it is assumed that: (a) there is equality of schooling and training quality, access and ability; (b) in the period of formal schooling no time is spent in the employed labour force[2]; and (c) after schooling all time is spent in the employed labour force. The advantage of assumption (c) is that, when combined with the assumption that during schooling no time is spent working, it allows Mincer to replace the variable 'X' (actual experience) (a variable which in practice is difficult to observe) with a proxy, potential experience. Mincer measures potential experience as Age-S-5 (this measure is more commonly known as the 'Mincer proxy').

While the Mincer proxy may be approximately correct for prime-aged males[3], it is generally acknowledged that it is a poor proxy for female actual labour

[2] Some authors relax this assumption and instead assume that student earnings are the same as direct educational expenditures (see, for example, Chapman and Iredale, 1993, p.382).

[3] Nevile and Saunders (1998), however, note that "Even for men the convention that years of experience can be measured by age less age at which formal education was completed is becoming suspect as long spells of unemployment become more and more common …" (p.281).

market experience as a result of their intermittent participation. However, Blinder (1976) notes that in the absence of data on actual work experience any measure (including those which are imputed) will be plagued by statistical biases. Rummery (1992) shows that the use of actual rather than potential is of more importance where the focus is on measuring the size of the gender wage gap (potential experience is inclined to overstate the size of the gap).

III Data and Estimation Method

The data for this study are drawn from the 1981 and 1991 Census Household Sample Files (HSFs). In both cases the samples are restricted to full-time wage and salary earners aged between 16 and 64 years. (Appendix A in Preston (1997) provides details on the data and variables used.) There are 11,609 and 10,440 females in the 1991 and 1981 samples, respectively.

The dependent variable in all cases is the natural logarithm of weekly earnings ($\ln Y$). This variable picks up the weekly earnings from *all* sources (including overtime, allowances, interest etc.). The income data are grouped, thus the midpoints of each interval are used to estimate weekly earnings. Following Chiswick and Miller (1995) the open-ended upper limit is given a value of 1.5 times the lower threshold level.

In order to make comparisons with the male results (previously reported in Preston, 1997) the same model specifications are used. No attempt is made to impute female experience or adjust for sample selection bias.[4] The estimation technique is ordinary least squares (OLS). Amongst other things, this procedure assumes that the population disturbances are distributed with constant variance. A violation of this assumption means that OLS is no longer efficient and that the OLS estimator of the variance of the slope coefficients is biased and inconsistent. Standard errors may, consequently, be too large or too small, thus affecting the construction of confidence intervals for the testing of hypotheses. To minimize these adverse consequences of heteroskedasticity White's technique (White, 1980) is used. The technique provides a consistent estimates of the standard errors, and thus reliable (although unnecessarily large) confidence intervals.

In the analysis below the Breusch-Pagan (BP) test is used to detect whether or not heteroskedasticity is present. In all cases the null hypothesis of no heteroskedasticity was rejected and the *t*-statistics corrected using White's technique.

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[4] With respect to sample selection bias it may be that there are biases associated from estimating over a non-representative sample. In other words, it may be that the females in full-time employment are statistically different from their sisters elsewhere (e.g. in terms of motivation) and that this influences wages. There are techniques to deal with this (e.g. Heckman, 1979), however, Miller and Rummery (1991) argue that the problems introduced to the wage equation using the selectivity bias correction term may be greater than the bias associated with the analysis of a non-random sample in the first place. For this reason, and to facilitate comparisons with Preston (1997), we choose not to control for sample selection.

IV Determinants of Earnings: Contribution of Human Capital and Demographic Characteristics

Earnings and human capital endowments

In this section we commence with 'The' standard human capital earnings function described at equation (1) above. The results from this model show a decline in the rate of return to female schooling over the 1980s; falling from 9.4 per cent in 1981 to 8.8 per cent in 1991 (t=2.52). Amongst males the return to schooling (*S*) remained constant at 9 per cent.

When *S* is replaced with four dummy variables capturing the highest education level achieved (*hschool, cert, diploma* and *degree*) there is a decline in the relative rates of return at all (female) education levels, except *hschool* (where the rate remained constant). The male results are similar; except males experienced a decline in the rate of return at *all* education levels (including *hschool*) (see Preston, 1997).[5]

The findings of declining rates of return to education are consistent with those reported elsewhere. Nevile and Saunders (1998) note that with globalization this is a 'minor puzzle' and suggest that aggregation, which ignores the particular employment experience in the public sector[6], is hiding the underlying trends. When Nevile and Saunders estimate separate (male) wage equations for the public and private sectors they find that over the 1980s the extra earnings of those with degrees declined in the public sector and increased by more than 50 per cent in the private sector.

Following Nevile and Saunders the male and female wage equations are re-estimated disaggregated by sector of employment. Table 1 below presents the female results.[7] As with Nevile and Saunders, the results show that different types of study do not have the same effect on earnings. There are also differences between the sexes and between sectors of employment.

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[5] These male results contradict the schooling results (i.e. controlling for years of schooling rather than the levels approach used above). Two possible explanations may be advanced to explain the contradiction. Firstly, there has been an increase in the average educational attainment among those in the benchmark group which is captured using '*S*', but not using the 'levels' approach. Secondly, the '*S*' approach, being a linear variable, is not sufficiently sensitive to capture changes in the returns at higher educational levels. This may suggest that an alternative functional form should be used, for example, the use of *S* and S^2 together in the equation.

[6] Nevile and Saunders (p.280) note that, as compared to the private sector, the public sector has in the past offered favourable employment conditions as measured by security, superannuation etc. They have also employed a higher proportion of employees with degrees and, because of the low propensity to leave for the private sector, have not had to resort to attraction wages to retain their employees. Further, public sector pay was influenced by the operation of the Accord, with the Accord tending to reduce wage rates and limit wage dispersion.

[7] In the 1981 Census data the top 'hours' bracket was 35 or more hours per week. The 1991 Census data allowed for more disaggregation on the upper hours information. From this we are able to create an 'overtime' variable defined as working more than 40 hours per week. This variable is significant in all earnings equations estimated. For comparative purposes we omit it from models detailed in Table 1. Table A.1 in the appendix presents the 1991 results when overtime is included in the model estimated at Table 1 below.

Over the 1980s females employed in the private sector experienced an increase in the returns associated with the completion of high school or a diploma. There was no change in the returns associated with certificate credentials and the returns associated with the completion of a degree actually fell. Amongst females in the public sector there was a decline in the rate of return at all education levels.[8]

TABLE 1

Earnings, Education and Experience: Females, by Sector, 1981 and 1991

	1981: Private Sector			1981: Public Sector		
	Coeff.	t-stat	mean	Coeff.	t-stat	mean
constant	4.747	383.128		4.895	248.248	
hschool	0.135	12.760	0.405	0.139	7.551	0.335
cert	0.237	16.089	0.145	0.264	14.799	0.196
diploma	0.411	16.131	0.035	0.541	28.917	0.140
degree	0.655	22.410	0.031	0.666	30.749	0.135
exp	0.040	29.351	14.731	0.031	17.459	13.703
$exp^2/100$	-0.078	22.788	3.762	-0.060	13.737	3.295
$\ln Y$	5.168			5.389		
R^2 adjusted	0.222			0.380		
BP test	201.266			132.211		
n	7020			3420		
	1991: Private sector			1991: Public sector		
	Coeff.	t-stat	mean	Coeff.	t-stat	mean
constant	5.484	345.615		5.690	253.224	
hschool	0.141	11.380	0.463	0.124	6.046	0.286
cert	0.233	15.586	0.127	0.191	8.572	0.121
diploma	0.434	21.103	0.057	0.403	20.329	0.178
degree	0.604	31.325	0.104	0.530	27.820	0.282
exp	0.041	27.756	15.640	0.029	16.179	16.575
$exp^2/100$	-0.081	21.440	3.830	-0.056	12.097	3.921
$\ln Y$	6.000			6.231		
R^2 adjusted	0.244			0.326		
BP test	155.675			156.334		
n	7743			3866		

Male degree holders in the private sector experienced an increase in their relative returns. (The returns at all other education levels fell). This finding on university degrees is consistent with that of Nevile and Saunders, although the magnitude of the increase uncovered here is much smaller. In the latter the return to a university degree increased by more than 50 per cent over the

[8] Nevile and Saunders estimate a slightly different form of model here. They control for years of schooling in addition to education level. This approach treats the years spent acquiring a qualification as different from years in formal training. Using this approach we find that amongst females in the private sector there is an *increase* in the returns to education at all levels. In the public sector there is a decline at all levels, except high school (where an increase is revealed).

decade. In the present study the increase is only in the order of five per cent.[9] In the public sector the rate of return to (male) High School, Diploma and Degree credentials fell. The rate of return associated with (male) Certificate qualifications remained constant over the period.

Turning to experience, over the decade there has been no change in the rate of return to (female) general labour market experience and no change in the years taken for their experience earnings profile to peak (26 years). In 1981 an additional year of experience increased female earnings by 2.30 per cent; by 1991 the comparable estimate was 2.33 per cent (evaluated at 10 years of labour market experience). These results are consistent with the male estimates, where the returns to experience were constant at 3.2 per cent (using the same model specification) and the years to peak was 29.

As before data aggregation masks underlying trends. In 1981 an additional year of labour market experience increased female earnings by 2.45 per cent in the private sector and 1.91 per cent in the public sector. The corresponding estimates for females in 1991 were 2.49 per cent (private sector) and 1.78 per cent (public sector). Thus, over the decade, there was a very slight increase in the rate of return to experience in the private sector and a decline in the public sector.[10]

Earnings, Human Capital and Demographic Characteristics

In the literature the human capital model used above is frequently augmented with demographic controls such as marital status, dependant children and nationality. The marital status and dependant children controls are included to capture or account for the intermitted labour market experience of females. Birthplace or nationality controls capture discrimination and the difficulties faced in transferring skills acquired overseas to the Australian labour market. In the remainder of this section we examine the determinants of female relative earnings by sector using an augmented wage equation.[11] The female results are reported in Table 2.

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[9] As noted in the previous footnote, Nevile and Saunders use a different model specification controlling for years of schooling along with education level. Adopting this approach we find that over the 1980s the coefficient on the degree variable increases by 9 per cent. Nevile and Saunders also specify a more detailed wage equation on their private sector sample, controlling for demographic characteristics, location, and industry of occupation.

[10] By comparison, over the 1980s the returns to male experience increased from 3.36 per cent to 3.59 per cent in the private sector. In the public sector there was no change in the rate of return. In both 1981 and 1991 it was equal to 2.73 per cent.

[11] In addition to the human capital variables outlined above, we also control for marital status (two dummies used are: *married* controlling for those who are married; and *wsd* controlling for those who are either widowed, separated or divorced); dependant children (four controls are used: *nkid1, nkid2, nkid3, nkid4* controlling for the number of dependant children present (equal to 1, 2, 3 and 4 or more respectively)); birthplace (two controls are used: *esb* controlling for those born abroad in an English-speaking country; and *nesb* controlling for those born in a non-English speaking country).

TABLE 2:
Earnings, human capital and demographic characteristics, by sector, 1981 and 1991

	1981				1991			
	Private Sector		Public Sector		Private Sector		Public Sector	
	Coeff.	t-stat	Coeff.	t-stat.	Coeff.	t-stat	Coeff.	t-stat
constant	4.724	387.740	4.875	246.000	5.459	338.678	5.673	253.107
hschool	0.131	12.784	0.134	7.339	0.141	11.506	0.127	6.158
cert	0.228	15.791	0.254	14.437	0.233	15.678	0.190	8.583
diploma	0.410	16.099	0.540	29.471	0.436	21.280	0.413	21.06
degree	0.655	22.848	0.658	31.089	0.615	32.077	0.534	27.883
exp	0.045	27.078	0.039	20.775	0.048	27.294	0.033	15.853
$exp^2/100$	-0.091	23.956	-0.077	17.240	-0.097	23.327	-0.066	12.502
esb	0.006	0.469	-0.005	0.270	0.029	2.136	-0.012	0.613
nesb	-0.065	5.269	-0.075	4.180	-0.067	4.660	-0.060	3.936
married	0.080	9.941	0.029	2.520	0.026	2.187	0.017	1.321
wsd	0.156	9.534	0.025	1.138	0.051	3.155	0.051	2.958
nkid1	-0.136	8.646	-0.101	4.449	-0.112	7.159	-0.062	3.197
nkid2	-0.163	8.651	-0.154	6.384	-0.151	9.242	-0.068	4.074
nkid3	-0.268	7.803	-0.272	5.470	-0.196	5.896	-0.080	3.465
nkid4	-0.190	2.896	-0.139	1.772	-0.214	3.738	-0.255	3.288
R^2 adjusted	0.256		0.400		0.263		0.337	
BP test	7020		328.404		265.507		397.365	
n	7020		3420		7743		3866	

In the literature there are numerous studies demonstrating a significant difference in the wage structure of non-migrants and migrants (particularly those born in a non-English-speaking country). In the case of males, migrants from English-speaking backgrounds typically perform as well (if not better) than their Australian-born counterparts. Migrants from non-English-speaking backgrounds, in contrast, earn significantly less (see, for example, Preston, 1997; Chapman and Mulvey, 1986; and Langford, 1995).

At an aggregated level there is no significant difference in the earnings of Australian born females and those born in English-speaking countries (*esb*).[12] Females born in non-English-speaking countries (*nesb*) are, however, at an earnings disadvantage. In 1991 these females earned 7 per cent less than their Australian born counterparts. Over the decade there was been no change in their relative position. This parallels the male experience.[13]

A different trend is apparent when the data are disaggregated by sector. In the private sector in 1991 females born in English-speaking countries had an earnings advantage of 2.9 per cent relative to their Australian born counterparts. Females born in non-English-speaking countries earned 6.7 per

[12] The aggregated results are contained in Table A2 in the appendix.

[13] In Preston (1997) the coefficient on the *nesb* dummy variable was equal to –0.107 in 1981 and –0.085 in 1991. This would suggest that an improvement had occurred over the decade. However, the 1991 model includes a variable for overtime work. When the same model (i.e. with no overtime control) is estimated on the 1981 and 1991 data the results show no significant difference in the performance of migrant males over the decade.

cent less than Australian born females. In the public sector there was no significant difference in the earnings of *esb* and Australian born females. In contrast, females born in *nesb* countries earned 6 per cent less.

Over the decade 1981 to 1991 there has been an improvement in the relative earnings of *esb* females in the private sector. In the public sector *esb* females have performed as equally well as their Australian born counterparts (in both periods there was no significant difference in their earnings). There was also no change in the relative earnings of *nesb* females in the private sector over the same period. In the public sector *nesb* females improved their relative earnings by 1.5 percentage point (moving from an earnings disadvantage of -7.5 per cent to a disadvantage of 6 per cent).[14]

We turn now to marital status and dependant children. According to Becker (1985) marriage may induce women to "… seek more convenient and less energy intensive jobs". Marriage may also "… influence many young women during their prematernal employment to acquire less job training than men with comparable education" (Mincer and Polachek, 1974, p.S83). For this reason we would expect a negative sign on the dummy variable *married*.

In the literature the evidence is mixed. Langford (1995) and Rummer (1992) find no significant difference in the earnings of females disaggregated by marital status.[15] In contrast Kidd and Viney (1991) and Chapman and Mulvey (1986) show that females who had never married are at a significant earnings *disadvantage*. The results in Table 2 are consistent with the findings of the latter. They also parallel the male experience, except in the case of the males the earnings premium associated with marriage is much higher. In 1991 married females (at an aggregated level) earned 2.7 per cent more than their never married counterparts (see Table A2 in the appendix). The corresponding figure for males was 11.9 per cent.

At a disaggregated level we find that marriage is associated with a much higher premium in the private sector than it is in the public sector, although the premium attached to marriage has declined over the decade (see Table 2). In 1981 married females in the private sector received 8 per cent more than their never married counterparts. By 1991 this premium had been reduced to 2.6 per cent. Similarly, in 1981 married females in the public sector earned 2.9 per cent more than their never married counterparts, but by

[14] The following table presents the male 'birthplace' coefficient estimates associated with a model similar to that reported in Table 2.

	1981	1991
ESB		
Private	0.0405 (t=4.542)	0.0574 (t=5.189)
Public	-0.0339 (t=2.806)	-0.0209 (t=1.669)
NESB		
Private	-0.0939 (t=11.206)	-0.1072 (t=10.454)
Public	-0.1328 (t=10.604)	-0.1023 (t=7.845)

[15] The finding that marriage has little or no relationship with women's wages is consistent with that reported in overseas literature (see Korenman and Neumark, 1992, for an overview).

1991 there was no difference between the earnings of married and never married women in the public sector.

The results with respect to widowed, separated and divorced women (*wsd*) are also of interest. In 1981 females falling into this category in the private sector had an earnings premium of 15.6 per cent, although by 1991 this had fallen to 5.1 per cent. In the public sector in 1981 there was no difference in the earnings of *wsd* women and the reference group. However, by 1991 they had a relative earnings advantage also equal to 5.1 per cent.

Whilst marriage appears to be positively associated with female earnings, the same cannot be said of children. As predicted, the presence of dependant children is associated with significantly lower earnings. The penalty for having children is greater in the private sector than it is in the public sector (see Table 2). The finding that children lower earnings is consistent with that reported elsewhere (e.g. Gregory and Daly, 1990; Langford, 1995; and Miller and Mulvey, 1996).

The result may be picking up the effects of an intermittent work history on experience. It may also reflect reduced levels of investment in human capital, either by the individual or the employer or both. It is interesting to note that amongst males there is no penalty associated with having dependent children. In fact, males with 2 or 3 dependent children present earned significantly more than the omitted category in 1981 (in the public sector) and 1991 (in the private sector). In the public sector in 1991 there was no significant different between the earnings of males with or without dependent children present.

So far we have explored the determinants of female earnings focussing exclusively on human capital and demographic factors. Disaggregating the data by sector we show that the rewards associated with these characteristics vary across the public and private sectors and by sex. At the mean females in the public sector in 1991 earned 23 per cent more than their private sector colleagues.

To investigate the determinants of this large (female) public sector premium we use a procedure proposed by Blinder (1973) and Oaxaca (1973) to decompose the sector wage differential.[16] Adopting the public sector wage structure as the non-discriminatory norm, the raw wage gap of 23 per cent ($\overline{\ln Y_{pub}} - \overline{\ln Y_{priv}}$) may be decomposed as follows:

$$\overline{\ln Y_{pub}} - \overline{\ln Y_{priv}} = (\overline{V}_{pub} - \overline{V}_{priv})\hat{\beta}_{pub} + \overline{V}_{priv}(\hat{\beta}_{pub} - \hat{\beta}_{priv}) + (\hat{\beta}_{0\,pub} - \hat{\beta}_{0\,priv}) \qquad (2)$$

where *pub* denotes the public sector, *priv* denotes the private sector, $\overline{V}$ is a vector of the means of the independent variables and $\hat{\beta}$ is a vector of estimated slope coefficients. The first term of the decomposition calculates the portion of the gap attributable to differences in individual characteristics,

[16] The procedure is more commonly used to examine gender wage discrimination.

and is often labeled the *explained portion* (or skill differential). The second term calculates differences in returns to these characteristics, and is generally known as the *unexplained portion*. The third term represents differences in the constants ($\hat{\beta}_0$). Together the last two terms can be seen as being an indicator of the extent of discrimination (Blinder, 1973) and/or data deficiencies. Table 3 presents the results from the decomposition exercise.

TABLE 3
Decomposition of the 1991 (female) sector wage gap.

	Raw Wage Gap	Explained Gap	Explained as a % of Raw Wage Gap	Unexplained Gap	Unexplained Gap as a % of Raw Wage Gap	Private/ Public Earnings Ratio
human capital (ed. and exp)		0.1467	63			
birthplace		0.0014	1			
marital status		0.0013	1			
Children		-0.0045	-2			
TOTAL	0.2311	0.1449	63	0.0863	37	91.4%

Source: regressions reported in Table 2:

The estimates in Table 3 suggest that the raw wage gap of 23 per cent (in favour of public sector employees) predominantly arises because of differences in the human capital endowments of females in the two sectors. Females in the public sector are better qualified than their private sector counterparts. After taking these differences into account the adjusted wage gap falls to 8.62 per cent (i.e. private sector female earn 91.4% of their public sector counterparts).[17,18] This 8.62 per cent gap may be regarded as an indicator of the level of discrimination in the private sector. It also measures data deficiencies. The private sector may be rewarding unobserved individual differences (e.g. motivation) not captured in the data here.

Using a similar decomposition approach we also examine how the gender pay gap varies within the public and private sectors. Separate male (*m*) and female (*f*) wage equations of the form $\ln \hat{Y}_{im} = \hat{\beta}_{0m} + V_{im}\hat{\beta}_m$ and $\ln \hat{Y}_{if} = \hat{\beta}_{0f} + V_{if}\hat{\beta}_f$ are estimated for each sector. Adopting the male wage structure in each sector as the non-discriminatory norm the raw wage gap may be decomposed as follows:

$$\overline{\ln Y_m} - \overline{\ln Y_f} = (\overline{V}_m - \overline{V}_f)\hat{\beta}_m + \overline{V}_f(\hat{\beta}_m - \hat{\beta}_f) + (\hat{\beta}_{0m} - \hat{\beta}_{0f}) \qquad (2)$$

[17] In 1981 the raw wage gap was equal to 22 per cent, of which 57 per cent could be explained by differences in the human capital endowments across the sectors. After adjusting for observed differences the adjusted wage gap fell to 8.84 per cent.

[18] This premium is consistent with that estimated in other studies. Langford (1995), for example, estimates a public sector (female) premium of 7.96 per cent. It is also consistent with the coefficient on a dummy variable in an aggregate regression controlling for education (4 dummies), experience and its square, birthplace (2 dummies), martial status (2 dummies) and children (4 dummies) and sector of employment (1 dummy). Using 1991 data the 'sector dummy' coefficient was equal to 7.48 (t=9.850).

Tables 4 and 5 present, respectively, the 1991 private and public sector results. The raw wage gap in the private sector is higher than that of the public sector (equal to 23 and 14.8 per cent respectively). However, after adjusting for differences in the human capital endowments within the two sectors we find that the adjusted wage gaps are very similar in each sector; equal to 14.8 per cent in the private sector and 13.5 per cent in the public sector.

It is interesting to note that the model is better able to account for the wage gap in the private sector than it is in the public sector. In the private sector 19 per cent of the gap reflects differences in the human capital endowments of the sexes, and 18 per cent is due to differences in overtime worked. The model is able to explain 41 per cent of the observed differences in the wage gap in this sector.

In contrast, the human capital model is only able to account for 12 per cent of the difference in the gender wage gap in the public sector. Moreover, the negative sign on the human capital grouping indicates that females have, on average, higher levels of human capital than males. As a result the female wage gap is in fact 1.18 percentage point higher than it otherwise would have been had females had the same endowments as males, other things being equal.[19]

[19] In 1981 the raw wage gap in the private sector was equal to 31.9 per cent, and differences in human capital endowments and demographic characteristics could explain 33 per cent of this gap. After adjusting for these factors the wage gap was reduced to 21.27 per cent. In the public sector in 1981 there was a raw wage gap of 23.9 per cent, with human capital endowments (education and experience) accounting for 14 per cent (or 3.38 percentage points) of this gap. Overall human capital endowments and demographic characteristics could explain 25 per cent of the public sector wage gap in 1981. Taking these factors into account the adjusted wage gap falls to 17.86 per cent.

Over the decade the portion of the gap unexplained by the model has fallen in the private sector and risen in the public sector.

TABLE 4
Decomposition of the Private Sector Wage Gap, 1991.

	Raw Wage Gap	Explained Gap	Explained Gap As A % Of Raw Wage Gap	Unexplained Gap	Unexplained Gap As A % Of Raw Wage Gap	Female/ Male Earnings Ratio
human capital (education and experience)		0.0449	19			
birthplace		-0.0013	-1			
marital status		0.0120	5			
children		0.0032	1			
overtime		0.0421	18			
metro		-0.0056	-2			
Total	0.2305	0.0953	41	0.1351	59	86.5%

Note: The male estimates are taken from Table 3 in Preston (1997, p.60). For conformity with those results we re-estimate the female models at Table 2 (this article) and include two additional variables: a control for overtime work (41 hours or more per week) and a dummy variable equal to 1 if the person resides in a metropolitan area.[20]

TABLE 5
Decomposition of the Public Sector Wage Gap, 1991.

	Raw Wage Gap	Explained Gap	Explained Gap As A % Of Raw Wage Gap	Unexplained Gap	Unexplained Gap As A % Of Raw Wage Gap	Female/ Male Earnings Ratio
Human Capital (education and experience)		-0.0118	-8			
birthplace		0.0004	0			
marital status		0.0124	8			
children		0.0007	0			
overtime		0.0165	11			
metro		-0.0011	-1			
TOTAL	0.1482	0.0171	12	0.1310	88	86.7%

Notes: see notes to Table 4.

In concluding this section we note that significant determinants of female earnings are human capital endowments and demographic characteristics such as birthplace, marital status and children. We also note that there are significant difference between the public and private female wage structures and that the human capital model is better able to explain public sector female earnings than it is private sector earnings. However, the model is less well equipped to account for gender wage differences in the public sector, leaving a large portion of the gap (88 per cent) unexplained.[21]

We know from the literature that other structural factors (such as industry and occupation of employment) are important determinants of male and female earnings (e.g. Preston, 1997; Langford, 1995; and Miller and Mulvey, 1996).

[20] The overtime dummy was previously not used so that comparisons could be made with the 1981 data. In the 1981 HSF it is not possible to separately identify persons working 41 hours or more per week.

[21] Langford, (1995, p.74) similarly finds evidence of a larger unexplained component in the public sector.

In the following section we further explore the relationship between structural factors and female earnings.

V Determinants of Earnings: Contribution of Job Characteristics

In this section we examine the effect on female earnings of geographic location, industry and occupation of employment. Whilst acknowledging that the determinants vary by sector of employment we opt to control for sectoral differences with a single dummy variable (equal to 1 if the person is employed in the public sector). The models are thus estimated at an aggregate level. This has the advantage of allowing comparisons with published male results. However, towards the end of this section we incorporate these additional structural factors into a disaggregated (sector) analysis of the gender pay gap.

(i) Geographic location

Empirical estimates in the literature show that females (and males) residing in a metropolitan area have a significant earnings advantage over their rural counterparts (e.g. Gregory and Daly, 1992 and Chapman and Mulvey, 1986). Using 19 detailed geographic or locational controls we explored this phenomenon further with the 1991 Census data on females.

In the first instance we conducted a test for the joint significance of the 19 locational dummy variables. We found that geographic location exerted an independent and significant force on female earnings ($F=16.45 > F_{19,11609}= 1.905$). We then proceeded to normalise the inter-regional wage differentials as deviations from the overall mean.[22] On doing this we find that females residing in lower north New South Wales had the highest relative earnings; equal to 11.9 per cent more than the overall average. This was followed by Sydney residents (7.8 percent) and Melbourne residents (5.6 per cent). At the bottom of the continuum we find that females residing in Richmond and Tweed area earned 14.27 per cent *less* than the overall mean.

Using a composite measure designed to split the data into metropolitan and rural geographic location we find that, consistent with the above, females in metropolitan areas have an earnings advantage equal to 9 per cent, significant at the one per cent level.[23] (The corresponding estimate for males was 8.3 per cent).

(ii) Industry of Employment

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[22] Krueger and Summers (1988) and Borland and Suen (1990) detail the methodological approach used to calculate the proportionate effects as deviations from the mean.

[23] It is difficult to clearly separate the data into two categories, metropolitan and rural. Residents in Canberra are, for example, aggregated with residents from Tasmania. Metropolitan areas are, nevertheless, defined as consisting of: inner Sydney, Sutherland and Liverpool, outer south west New South Wales, lower north New South Wales, Hunter and Illawarra, western and outer Melbourne, central Melbourne, east outer Melbourne, Brisbane, Adelaide and Perth. In 1991 71.8 per cent of the female sample lived in these areas.

To examine how industry of employment affects female earnings we controlled for mainly two digit industry groups (33 in total). An F test for the joint significance of the industry dummies led to a rejection of the null hypothesis that the coefficients on each of the controls were simultaneously equal to zero ($F=23.6>F_{33,11559}=1.66$). Industry is an important determinant of female earnings and its inclusion increases the explanatory power of the model by 12 per cent as measured by the adjusted R^2 (i.e. from 0.332 to 0.373).[24]

Earnings vary considerably across the industry groups controlled for. In 1991, for example, females employed in the Coal and Oil Industry earned 40 per cent *more* than the average earnings from all industries. The group enjoying the second highest premium was Metallic Minerals. Females employed in this industry sub-group earned 32 per cent more than the average earnings for all industries. At the other end of the scale females in Agriculture, Forestry, Fishing and Hunting (AFFH) earned 43 per cent *less* than the average earnings. The second lowest earnings industry sub-group was Personal Service Workers. They earned 21 per cent less than the average industry earnings. This was followed by Welfare workers; their earnings were 17 per cent less than the industry average.[25] Reflecting these wide disparities in average earnings across the industries the standard deviation of the inter-industry wage differentials was equal to 9.3 per cent in 1991.

When compared with the 1981 data some changes are apparent.[26] First of all the dispersion of inter-industry average wages was narrower. In 1981 the standard deviation was equal to 7.8 per cent. Consistent with this females employed in the highest paid industry, Other Mining, only earned 20 per cent more than the average earnings for all industries. Females employed in Metallic Minerals earned 19 per cent more than the average. At the other end of the scale, females in AFFH earned 42 per cent *less* than the average.

Other noticeable differences relate to industries such as Coal and Oil and Metallic Minerals. In 1981 the relative (to the average) earnings in these two industries were 17 and 19 per cent respectively. In 1991 the differential had widened to 40 and 32 per cent respectively. Over the same period females in the Fabricated Metal Industry found that their relative earnings disadvantage widened from 1 per cent to 10 per cent. It is unlikely that these changes relate to differences in supply over the period. The proportion of the female sample employed in Coal and Oil and Metallic Minerals remained unchanged over the 1980s. In the Fabricated Metal Industry there was a fall in the share of females working in this industry.

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[24] The independent variables in the model now comprise: 4 human capital dummies; experience and its square, 2 birthplace dummies; 2 marital status 2 dummies, 4 children 4 dummies; 1 geographic location dummy; 1 sector of employment dummy; and 33 industry dummies.

[25] These estimates differ slightly from those reported in Preston (1997) due to a different specification of the model. The model used here excludes overtime in order that comparisons may be made with the 1981 data.

[26] A full set of industry coefficients and per cent deviation estimates for 1981 and 1991 are presented in Table A3 in the appendix to this paper.

Notwithstanding these disparities, there is still a high degree of similarity between the 1981 and 1991 inter-industry female wage structures. For example, the Spearman rank correlation coefficient is equal to 0.829 (significant at the one per cent level). This indicates that the ranking of the industries according to the size of the wage differentials are similar in both years. A number of studies have sought to explain this phenomenon of persistent inter-industry differentials and, so far, have failed to find any strong explanation (e.g. Preston, 1997; Borland and Suen, 1993; Gregory and Daly, 1992; and Chang and Miller, 1996).

(iii) Occupation of Employment

As with the inter-industry wage structure, a dominant feature of the Australian labour market is persistent wage differences across occupations. Estimates in Chapman and Mulvey (1986), for example, show that amongst females Professional, Administrative and Clerical workers earn significantly more than all other broad occupational groups. Langford (1995) uses Labourers and Related workers as a reference group and similarly shows that, amongst females, those employed in a managerial or professional capacity, clerical or sales position earn significantly more than tradespersons, plant operators and labourers.

In this study we use mainly two digit occupational controls (19 dummies) to provide a more detailed analysis of the inter-occupational wage structure. As expected the estimates show the presence of a distinct occupational hierarchy (the results for 1981 and 1991 are presented in Table A4 in the appendix)[27] At the top of the 1991 hierarchy are: (a) health diagnosticians and treatment practitioners; (b) managers and administrators; and (c) police. They earn, respectively, 25, 24, and 23 per cent *more* than the average for all occupations. At the bottom of the female occupational hierarchy are: (a) tradespersons, labourers and related workers; (b) cleaners; and (c) farm managers. These three groups earn, respectively, 21, 23 and 28 per cent *less* than the average for all occupation groups taken together.

Using the standard deviation as an indicator of the extent of dispersion it would appear that there has been little change over the 1980s.[28] In 1981 the standard deviation of the inter-occupational female wage structure was equal to 15.9 per cent. By 1991 it had fallen to 15.7 per cent. However, a closer analysis reveals that, unlike the inter-industry female wage structure, there has been a compression of relativities above the mean and a widening of relativities below the mean. In other words, in 1981 the lowest paid occupational group earned 19 per cent less than the mean. By 1991 the lowest paid group earned 28 per cent less than the mean. Similarly, in 1981

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[27] Adding 19 occupational dummies raises the adjusted R^2 by 14 per cent to 0.4229 (using the 1991 sample). Further, an *F* test for the joint significance of the occupational dummies led to a rejection of the null hypothesis that the coefficients on each of the controls were simultaneously equal to zero. ($F=53.8 > F_{19,11540}1.9$).

[28] Spearman's rank correlation coefficient of the inter-occupational wage structures in 1981 and 1991 is equal to 0.6825 (significant at the one per cent level), indicating a high degree of correlation between the two wage structures.

the highest paid occupational group earned 32 per cent more than the mean. By 1991 this had fallen to 25 per cent.

Reflecting these shifts we find that in 1981 School Teachers (*schlt*) earned 25 per cent more than the mean. By 1991 their earnings advantage had been reduced to 13 per cent. This change may reflect an increasing share of females in teaching, although the proportion only increased from 6.2 per cent to 7.6 per cent over the period. The statistics on police are also of interest. In 1981 they had a relative earnings advantage of 32 per cent. By 1991 this had fallen to 23 per cent. Over this period the share of females in the police force only increased by 0.1 percentage point (from 0.1 to 0.2 per cent).

(iv) The Gender Wage Gap: including structural factors

It may be recalled that we earlier observed a significant difference in the earnings of males and females by sector of employment. After adjusting for observed differences in the human capital endowments and other characteristics of the sample we found that female/male earnings ratio was equal to 86.5% in the private sector and 86.7% in the public sector.

In the public sector decomposition the model was only able to explain 12 per cent of the variation in the earnings by gender. However, we now know that other structural factors, specifically industry and occupation are important determinants of earnings. To see how, if at all, the gender wage differential varies when these controls are included a further decomposition is undertaken using more detailed regressions (i.e. additionally controlling for mainly two digit industry and occupation groups).

The revised private and public sector decomposition results are contained in Tables 6 and 7, respectively. After adjusting for the observed differences between the gender groups the female/male earnings ratio is equal to 83.7 per cent in the private sector and 88.5 per cent in the public sector. The private sector gender ratio is lower than previously reported as the more detailed model is less well able to explain the observed differences in this sector. The portion of the gap unexplained has increased from 59 per cent to 71 per cent. In the case of the public sector the opposite holds, with the portion of the gap unexplained falling from 88 per cent to 78 per cent.

In both cases the results show that current occupational distribution of females serves to reduce rather than widen the gender wage gap. This result is consistent with other Australian studies (e.g. Chapman and Mulvey, 1986; Hawke, 1991; and Kidd 1993). If females had the same occupational distribution as males the gender wage gap would be 4.69 percentage points greater in the private sector and 2.87 percentage points higher in the public sector, other things being equal. This is because females in male dominated occupations receive lower relative wages (Langford, 1995, p.70).

Industry of employment, however, works in the opposite direction. Females are generally employed in low wage industry sectors. Had they been distributed across industries in the same way as males the gender wage gap

would have been 3.2 and 3.3 percentage points lower in the private and public sectors respectively. Langford (1995, p.71) similarly finds that industrial distribution accounts for a substantial proportion of the explained wage gap (27-28 per cent).

TABLE 6
Decomposition of the Private Sector Wage Gap, 1991.

	Raw Wage Gap	Explained Gap	Explained Gap As A % Of Raw Wage Gap	Unexplained Gap	Unexplained Gap As A % Of Raw Wage Gap	Female/ Male Earnings Ratio
human capital (education and experience)		0.0432	19			
birthplace		-0.0008	0			
marital status		0.0094	4			
children		0.0019	1			
overtime		0.0327	14			
metro		-0.0038	-2			
industry		0.0320	14			
occupation		-0.0469	-20			
Total	0.2305	0.0678	29	0.1627	71	83.7%

Notes: The defence industry and the police occupational group are excluded from the analysis here.

TABLE 7
Decomposition of the Public Sector Wage Gap, 1991.

	Raw Wage Gap	Explained Gap	Explained Gap As A % Of Raw Wage Gap	Unexplained Gap	Unexplained Gap As A % Of Raw Wage Gap	Female/ Male Earnings Ratio
human capital (education and experience)		0.0059	4			
birthplace		0.0003	0			
marital status		0.0095	6			
children		0.0017	1			
overtime		0.0112	8			
metro		-0.0006	0			
industry		0.0334	23			
occupation		-0.0287	-19			
TOTAL	0.1482	0.0328	22	0.1154	78	88.5%

Notes; the mining and manufacturing industrial groups have been aggregated to the one digit level as there were no females in some of these groups at the more disaggregated level.

VI Summary and Conclusion

In this paper we use Australian census data to examine trends in female relative earnings over the period 1981 to 1991. Comparisons are made with male results reported in Preston (1997). The key findings with regard to (female) earnings and human capital endowments are as follows:

- At an aggregate level the rate of return to schooling (*S*) fell from 9.4 per cent in 1981 to 8.8 per cent in 1991 (t=2.52). This trend also shows up in a levels approach (controlling for highest education level attained).

- When the data are disaggregated by sector we find that there has been a decline in the rate of return at all education levels in the public sector. In the private sector the returns associated with the completion of high school or a diploma credential increased over the 1980s. There was no change in the returns associated with certificate credentials and the returns associated with the completion of a degree actually fell.

- There was a slight increase in the rate of return to general labour market experience in the private sector and a decline in the public sector. At an aggregate level there was no change over the decade.

Turning to demographic characteristics the inter-decade analysis shows that:

- There has been an improvement in the relative earnings of *esb* females in the private sector (in 1991 they earned 2.9 per cent more than the reference group (Australian born females)) and no change in their relative earnings in the public sector.

- There was no change in the relative earnings of *nesb* females in the private sector (their earnings disadvantage was equal to 6.7 per cent) whilst in the public sector *nesb* females improved their relative earnings by 1.5 percentage point (thus in 1991 they earned 6 per cent less than Australian born females).

- Over the decade the premium attached to marriage fell in both the public and private sectors. By 1991 there was no difference in the earnings of married and never married females in the public sector. In the private sector the premium was equal to 2.6 per cent.

- The premium associated with being either widowed, separated and divorced (*wsd*) declined in the private sector and increased in the public sector. By 1991, in both the public and private sectors females falling into this category earned 5.1 per cent more than their never married counterparts.

- The penalty associated with having children declined, but remained significant in both the public and private sectors. It was greater in the

private sector than in the public sector. In the private sector in 1991 female with one dependant child earned 11 per cent less than those with no dependant children. The corresponding figure in the public sector was 6 per cent.

A decomposition of female and male earnings by sector also revealed differing underlying trends. Table 8 below summarises the key findings. In the private sector the 1991 unadjusted (or raw) wage differential was equal to 23 per cent, with differences in human capital endowments being the main explanatory factor. Taking into account the productivity related differences between the sexes the raw gap of 23 per cent was reduced to an adjusted wage gap of 13.52 per cent. This adjusted wage gap is comparable with the corresponding public sector estimate (13.11 per cent), although in the latter case the raw wage gap was much lower (equal to 14.82 per cent).

TABLE 8
Accounting for the Public and Private Sector Wage Gaps, 1991

sample	Wage Gap (%)	Component	Model I: human capital, demographic characteristics and an urban residence control (percentage points)	Model I plus controls for segregation (industry and occupation) (percentage points)
Public	14.82	Productivity	1.71	3.28
		Unexplained	13.1	11.54
Private	23.05	Productivity	9.53	6.78
		Unexplained	13.52	16.27

Notes: The summary presentation here follows Langford (1995, Table V, p.75)

In 1991 public sector females had better human capital attributes than their male counterparts. Other things being equal, had females had the same human capital endowments as their male colleagues the adjusted public sector wage gap would have been 1.18 percentage points higher (i.e. equal to 14.29 per cent).

Including segregation variables (i.e. mainly two digit industry and occupation controls) in the decomposition changes the portions of the gap attributable to productivity and discrimination/omitted variables. We now find, consistent with Langford (1995), a fall in the level of 'discrimination' in the public sector and a rise in the level of 'discrimination' in the private sector. The adjusted wage gaps in these two sectors are, thus, 11.54 per cent and 16.27 per cent, respectively.

If females in both the public and private sectors had the same industrial distribution as males the gender wage gap would be around 3 percentage points lower in both cases (i.e. equal to 8.24 per cent in the public sector and 13.07 per cent in the private sector). However, if females had the same occupational distribution as males the wage gap would, in fact, be 2.87 percentage points higher in the public sector and 4.69 percentage points

higher in the private sector. As Langford (1995) notes, this arises because females in male dominated occupations are relatively poorly paid.

Overall the results presented in this paper show that the determinants of earnings differ by gender and by sector of employment. Although females in the private sector have experienced increasing returns to education and labour market experience, they nevertheless remain at a significant earnings disadvantage. The level of disadvantage is higher in the private sector, but only marginally. In both sectors the disadvantage is substantial.

Although the gap has reduced over the 1980s there is reason to be sceptical that the trend will continue into the 1990s. Since the late 1980s Australia has been gradually moving towards a more decentralised system of bargaining. The prediction in the literature is that females will be worse off under this system (Wooden, 1997). The results here lend further support to this hypothesis.

The marginally lower levels of discrimination in the public sector has been attributed to union initiatives and better implementation of equal pay initiatives (Langford, 1995). However, union membership levels have declined and decentralise bargaining makes it harder to implement equal pay. In addition, unlike their private sector counterparts, females in the public service experienced declining returns to education and labour market experience over the 1980s. In view of these facts one might predict increasing rather than decreasing levels of discrimination in the public sector in the future.

In addition to the above, females in both sectors are disadvantaged by their industrial composition. If females are under-represented in industries making gains under enterprise bargaining (e.g. Mining) then this may also cause the gender wage gap (in both sectors) to widen.

The inter-industry wage structures are stable (in terms of their ranking), however, there is evidence to show a widening of relativities, particularly at the top of the distribution. In 1981, for example, females in Coal and Oil earned 17 per cent more than the average for all industries. By 1991 the corresponding figure was 40 per cent. Similarly, in 1981 females in Retail Trade earned 7 per cent less than the average for all industries. By 1991 their relative earnings disadvantage had declined to 10 per cent. It thus remains to be seen whether or not there will be a further widening of relativities at the top of the inter-industry wage structure over the 1990s, and whether or not this will further exacerbate attempts to narrow the gender wage gap.

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APPENDIX A

Table A1
Earnings and Human Capital Endowments, Females, by Sector, controlling also for overtime work.

	1991 private sector			1991 public sector		
	coeff.	t-stat	mean	coeff.	t-stat	mean
constant	5.468	345.678		5.686	254.521	
hschool	0.133	10.878	0.463	0.120	5.860	0.286
cert	0.221	14.904	0.127	0.185	8.360	0.121
diploma	0.416	20.183	0.057	0.395	19.835	0.178
degree	0.571	29.733	0.104	0.508	26.362	0.282
exp	0.040	27.231	15.640	0.028	15.781	16.575
$exp^2/100$	-0.080	20.977	3.830	-0.055	11.746	3.921
otime	0.143	11.754	0.228	0.105	6.416	0.169
ln*Y*	5.995			6.231		
R^2 adjusted	0.262			0.336		
BP test	377.252			321.185		
n	7743			3866		

TABLE A2
Returns to Human Capital and Demographic Characteristics, Females.

	1981			1991		1991		
	coeff.	t-stat.	mean	coeff.	t-stat.	coeff.	t-stat.	mean
constant	4.760	458.269		5.508	418.880	5.495	419.550	
hschool	0.140	15.531	0.382	0.140	13.272	0.135	12.880	0.404
cert	0.253	23.189	0.162	0.228	28.542	0.221	18.083	0.125
diploma	0.531	39.007	0.069	0.465	36.338	0.458	35.802	0.097
degree	0.700	45.191	0.065	0.604	50.125	0.582	48.460	0.163
exp	0.044	34.175	14.394	0.044	32.527	0.043	31.940	15.951
$exp^2/100$	-0.088	29.514	3.609	-0.089	27.048	-0.087	26.448	3.860
esb	0.001	0.067	0.120	0.014	1.224	0.014	1.246	0.119
nesb	-0.076	7.446	0.127	-0.070	6.361	-0.063	5.776	0.121
married	0.065	7.777	0.463	0.026	2.957	0.027	3.132	0.476
wsd	0.113	8.611	0.104	0.053	4.387	0.054	4.507	0.125
nkid1	-0.124	9.494	0.103	-0.093	7.619	-0.091	7.783	0.120
nkid2	-0.163	10.763	0.090	-0.121	10.102	-0.115	9.683	0.105
nkid3	-0.276	9.683	0.029	-0.152	6.861	-0.147	6.725	0.035
nkid4m	-0.178	3.453	0.010	-0.237	5.094	-0.228	4.906	0.008
otime	-	-	-	-	-	0.113	11.607	0.209
R^2 adjusted	0.329			0.318		0.328		
BP test	648.2			325.9		747.8		
n	10440			11609		11609		

TABLE A3

Comparison of the 1981 and 1991 female inter-industry wage structures

1991					1981				
Industry label	Coeff.	t.stat.	mean	% deviation from overall mean	Industry label	Coeff.	t.stat.	Mean	% deviation from overall mean
coil	0.341	3.970	0.001	0.40	omin	0.150	1.919	0.002	0.20
metmin	0.263	3.963	0.002	0.32	metmin	0.141	1.681	0.002	0.19
omin	0.176	2.473	0.001	0.23	coil	0.121	1.050	0.001	0.17
chem	0.101	2.333	0.008	0.16	egw	0.056	1.145	0.007	0.10
defen	0.069	1.628	0.007	0.12	ent	0.032	0.762	0.011	0.08
bank	0.068	2.822	0.068	0.12	nonmet	0.026	0.400	0.003	0.07
metal	0.065	1.253	0.003	0.12	ins	0.020	0.563	0.020	0.07
ins	0.040	1.408	0.025	0.10	bank	0.018	0.610	0.061	0.07
pbs	0.030	1.206	0.081	0.09	chem	0.017	0.414	0.010	0.07
paper	omitted		0.017	0.06	ocs	0.011	0.301	0.017	0.06
tstore	-0.004	-0.137	0.029	0.05	tstore	0.011	0.316	0.025	0.06
wt	-0.005	-0.191	0.055	0.05	pbs	0.007	0.225	0.060	0.06
const	-0.007	-0.174	0.012	0.05	metal	0.000	0.003	0.005	0.05
mach	-0.009	-0.283	0.013	0.05	paper	-	-	0.015	0.05
ocs	-0.013	-0.416	0.024	0.04	pubad	-0.002	-0.076	0.054	0.05
nonmet	-0.015	-0.239	0.002	0.04	wt	-0.003	-0.092	0.057	0.05
egw	-0.024	-0.372	0.006	0.03	ed	-0.014	-0.441	0.105	0.04
pubad	-0.026	-0.975	0.063	0.03	defen	-0.014	-0.279	0.006	0.03
ent	-0.051	-1.235	0.013	0.00	vehic	-0.032	-0.781	0.011	0.02
com	-0.059	-1.659	0.014	0.00	health	-0.047	-1.606	0.160	0.00
vehic	-0.065	-1.037	0.007	-0.01	com	-0.050	-1.344	0.019	0.00
ed	-0.067	-2.745	0.124	-0.01	mach	-0.054	-1.593	0.025	-0.01
health	-0.073	-2.999	0.144	-0.02	fabmet	-0.059	-1.419	0.011	-0.01
rest	-0.098	-3.604	0.033	-0.04	food	-0.074	-2.233	0.029	-0.03
text	-0.100	-2.537	0.005	-0.04	const	-0.083	-2.128	0.014	-0.03
food	-0.109	-3.851	0.025	-0.05	text	-0.094	-2.194	0.010	-0.05
wood	-0.119	-2.746	0.005	-0.06	wood	-0.100	-2.114	0.007	-0.05
mman	-0.138	-3.638	0.007	-0.08	mman	-0.103	-2.525	0.012	-0.05
rt	-0.154	-6.566	0.120	-0.10	rt	-0.116	-4.084	0.136	-0.07
fabmet	-0.156	-2.948	0.006	-0.10	rest	-0.136	-4.066	0.027	-0.09
cloth	-0.209	-7.022	0.020	-0.15	cloth	-0.175	-5.489	0.038	-0.13
welf	-0.225	-6.634	0.028	-0.17	welf	-0.237	-6.358	0.016	-0.19
person	-0.268	-8.568	0.021	-0.21	person	-0.240	-6.207	0.014	-0.19
affh	-0.482	-7.017	0.010	-0.43	affh	-0.470	-11.143	0.011	-0.42
R^2 adj.	0.373				R^2 adj.	0.375			
BP test	1473				BP test	2239			
n	11609				n	10440			

Note: The other variables in the regression are listed at footnote 25 above. A description of the variable labels may be found in the appendix to Preston (1997).

TABLE A4

Comparison of the 1981 and 1991 female inter-occupation wage structures

1991					1981				
Occupation label	coeff.	t.stat.	mean	% deviation from overall mean	Occupation label	coeff.	t.stat.	mean	% deviation from overall mean
hlthd	0.275	7.101	0.013	0.25	pol	0.316	4.636	0.001	0.32
mgrad	0.266	15.925	0.063	0.24	hlthd	0.267	7.921	0.013	0.28
pol	0.261	5.538	0.002	0.23	mgrad	0.261	6.477	0.013	0.27
nats	0.195	4.608	0.005	0.17	schlt	0.239	9.155	0.062	0.25
busprof	0.193	11.388	0.037	0.16	bldprof	0.221	2.246	0.000	0.23
schlt	0.163	8.971	0.076	0.13	farmmgr	0.190	1.469	0.003	0.20
miscpf	0.145	6.472	0.018	0.12	miscpf	0.189	6.452	0.012	0.20
bldprof	0.144	3.251	0.002	0.11	nats	0.158	3.019	0.001	0.17
socprof	0.140	3.165	0.010	0.11	instrct	0.153	3.816	0.013	0.16
artists	0.132	3.381	0.008	0.10	artists	0.125	2.596	0.008	0.13
regnur	0.115	5.663	0.052	0.09	regnur	0.099	5.010	0.056	0.11
engass	0.114	2.308	0.003	0.09	techo	0.091	2.380	0.007	0.10
instrct	0.109	2.167	0.010	0.08	engass	0.030	1.088	0.009	0.04
mispp	0.101	5.937	0.033	0.07	socprof	0.016	0.220	0.008	0.02
clerw	Omitted	-	0.348	0.00	clerw	Omitted	-	0.420	0.01
techo	-0.005	-0.167	0.007	-0.03	busprof	-0.005	-0.225	0.027	0.00
salesw	-0.056	-5.207	0.161	-0.09	mispp	-0.082	-3.353	0.022	-0.07
trdlab	-0.179	-14.229	0.137	-0.21	salesw	-0.104	-6.981	0.111	-0.09
clean	-0.199	-6.467	0.013	-0.23	trdlab	-0.171	-13.518	0.161	-0.16
farmmgr	-0.249	-1.457	0.003	-0.28	clean	-0.199	-10.276	0.051	-0.19
R^2 adj.	0.419				R^2 adj.	0.422			
BP Test	2092				BP Test	2711			
n	11609				n	10440			

Note: The other variables in the regression include those listed at footnote 25, plus the 33 industry dummies at Table A1 above. A description of the variable labels may be found in the appendix to Preston (1997).