THE GENDER WAGE GAP IN THE 1990s*

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I. INTRODUCTION

The gender weekly wages gap between 1969 and 1979 fell from 42 per cent to 20 per cent (Mumford, 1989). This was primarily due to the Equal Pay decisions of 1969, 1972 and 1974 (Gregory and Duncan, 1981). Economists generally concluded that the remaining wage gap was the result of market factors as opposed to the setting of minimum awards (Short, 1986, p.321). Making this assumption, various studies using data from the early 1980s found that the remaining gap was due to labour market discrimination and women's lack of work experience (Nevile and Tran-Nam, 1992).

With the introduction of the *Sex Discrimination Act* 1984, the *Affirmative Action Act* 1986 it was hoped that labour market discrimination would steadily become insignificant. The remaining gap would be the result of women's lack of work experience. For many economists, this is not a policy concern since it supposedly results from a pure supply-side 'rational choice' (McConnell and Brue, 1992, p.366-72). Nevertheless, women's work experience was expected to increase as policies aimed at helping working mothers were introduced and attitudes within society concerning women working were changing.

Chart 1, however, reveals that the gender *weekly* wages gap has remained obstinately constant during the period 1982-93. This casts doubt on the assumptions made above.

First, Short (1986) questions the assumption that the wage gap is only due to market factors. She argues that the 1972 Equal Pay decision is yet to be fully implemented. Secondly, legislation and changing attitudes appear to have had little impact on the gender wage gap, because their effect is either long-term or insignificant.

This paper, while acknowledging the plausibility of Short's institutional explanation utilises a market-based human capital approach to determine the causes of the gender wage gap.[1] This method disaggregates the causes of the wage gap into two major factors: (i) demand-side discrimination and (ii) supply-side human capital choices.

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[1] This institutional explanation is not to be confused with dual labour market theories which are concerned with stratification due to the market, not a central regulatory body (Doeringer and Piore, 1971). This research program, has its own explanation of the gender wage gap. It is included, to an extent, in the present analysis with the inclusion of job factors such as occupation, industry and sector. Human capital theory though includes these variables from a supply and not demand perspective.

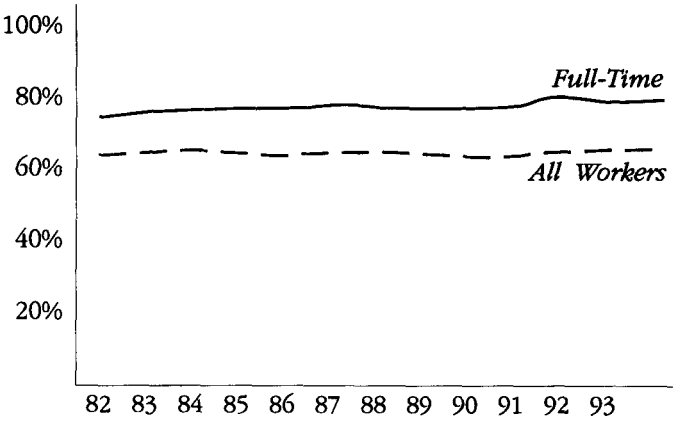

CHART 1

Average Weekly Earnings Gender Ratio

Source: Australian Bureau of Statistics, *Average Weekly Earnings* 1984, 1987, 1990, 1992 (Catalogue no. 6302.0)

The paper attempts to determine in 1990 what were the principal causes of the persistent gender wage gap and whether the results from the 1980s are still valid. A previously unavailable variable, tertiary education choices, is included and is found to be a significant cause of the wage gap. The paper also provides an empirical test of the controversy over the decomposition procedure between neoclassical and structuralist economists. The analysis is then extended by dividing the workforce into the public and private sectors and examining the level of discrimination within each sector. The effectiveness of interventionist policies, in light of this analysis, are subsequently assessed.

The outline of the paper is as follows. Section II contains a review of past studies and a presentation of the methodology. The data and regression results are examined in Section III and the decomposition procedure and a test on its validity are presented in Section IV. Discrimination in the public and private sectors is considered in Section V. Conclusions and policy implications are discussed in Section VI.

II. Literature Review and Methodology

Twelve Australian studies, following the human capital approach to earnings have attempted to explain the gender wage differential. The early studies of Haig (1982), Jones (1983) and Chapman and Miller (1983) were hampered by a lack of information on hourly earnings. The studies by Haig and Jones also suffered from misspecification of independent variables. Chapman's (1984) examination of a single occupation in the public service overcame these problems but the results presented little substance for general conclusions.

Chapman and Mulvey's (1986) research however, became the central work of the decade with access to a data set which included information on hourly wages and job tenure. They found that 23-49 per cent of the 15.4 per cent wage differential could be explained by productivity variables with the remainder a result of employer discrimination and other unspecified factors.

Since then, most studies have attempted to refine and extend this study. Kidd and Viney (1991) and Miller and Rummery (1991) attempted to correct the bias introduced by examining observed and not offered wages. They found that this bias accounted for a significant proportion of the discrimination figure. Hawke (1991) and Kidd (1991) examined the issues raised by occupational segregation. They discovered that most of the differential is due to intra-occupational discrimination and productivity factors. Inter-occupational segregation, a result of both choice and discrimination, accounted for very little of the gap.

Gregory and Daly (1990) conducted a cross-country analysis between the US and Australia. They found that human capital theory explains about 50 per cent or less of the earnings gap in each country but not the differences in the wage gaps between the two countries. Rummery (1992) and Drago (1989) concentrated on smaller data sets enabling access to better measures of labour market experience and workplace variables respectively. Rummery found that actual work experience contributed to 30 per cent of the wage gap. Drago found that job variables accounted for about two-thirds of the gap while traditional human capital variables explained little of the gap.

Most of the studies use data from the early 1980s.[2] This study seeks to explain the gender wage gap at the beginning of the 1990s and discover whether the same factors remain significant. Furthermore, a new variable containing tertiary education field choices is introduced, a test of the decomposition procedure is conducted and the analysis is extended to an examination of discrimination in the public and private sectors.

The methodology of the present study finds its origin in Becker's (1971) seminal paper. He suggested that the difference between an individual's wages (w) and their marginal productivity (MP) could be explained by a discrimination coefficient (d). This discrimination coefficient resulted from a taste for discrimination by employers (prejudice) amongst other things.[3] Discrimination can be simply defined as an employer taking into account non-productive characteristics of an employee in the determination of the employee's remuneration.

If only women experience discrimination, and men do not encounter nepotism from employers, we can write the following[4]

$$\frac{MP^F}{MP^M} = \frac{(1+d)w^F}{w^M} \qquad \text{where } F = \text{Females, } M = \text{Male} \tag{1}$$

[2] Hawke (1991) uses the 1986 Income Distribution Survey and Drago (1989) uses a National Institute of Labour Studies survey of 23 workplaces conducted in mid-1988.

[3] Lack of knowledge about an applicant's productivity (statistical discrimination) fits easily within this analysis (see Becker, 1971, p.16 and Arrow, 1973) as does union or employee tastes for discrimination (Becker, 1971).

[4] Following Butler (1982)

Taking logarithms of both sides

$$\ln w^M - \ln w^F = \ln (1 + d) + \ln MP^M - \ln MP^F \tag{2}$$

which implies that the gender wage gap can be explained by discrimination and differences in marginal productivity.

Emerging at the same time was human capital theory which postulated that the log of earnings was a function of a person's productive characteristics (X) which are approximations of marginal productivity, and the returns to these characteristics (b)

$$\ln w_i^s = b^s X_i^s \qquad \text{where } s = M, F \quad i = 1,\ldots,n \text{ individuals} \tag{3}$$

More specifically, Mincer's (1974) reduced-form equation can be written as

$$\ln w_i = b_0 + b_1 ED + b_2 EXP + b_3 EXP^2 + b_4 Z + \varepsilon \tag{4}$$

where ED is education, EXP is post-school labour market experience and Z is a vector of other variables.[5]

Oaxaca (1973) combining these two concepts, decomposed the logarithmic wage differential into quantifiable productivity and discrimination factors

$$\ln \overline{w}^M - \ln \overline{w}^F = \left(\overline{X}^M - \overline{X}^F\right) b^M + \left(b^M - b^F\right) \overline{X}^F \tag{5}$$

The first term is the portion of the wage gap due to differences in productivity and corresponds to the ($\ln MP^M - \ln MP^F$) term in equation (2). The second term indicates discrimination, which is shown by differences in returns, and corresponds to the ($1 + d$) term in equation (2).

Neumark (1988), amongst others, has suggested that the male wage structure is not the appropriate wage structure by which to measure the deviation of female wages. This method assumes that women, in the absence of discrimination, would receive the same returns for the human capital investments as men. An alternative approach would be to also use the female wage structure and provide a range for the discrimination coefficient (Oaxaca, 1973; Reimers, 1983). Neumark however, suggests a more general framework as follows

$$\ln \overline{w}^M - \ln \overline{w}^F = \left(\overline{X}^M - \overline{X}^F\right) b + \left[\overline{X}^M \left(b^M - b\right) - \overline{X}^F \left(b^F - b\right)\right] \tag{6}$$

where b represents the no-discrimination wage structure.

[5] See Mincer (1974), Chapman and Mulvey (1986) or Chapman and Miller (1983) for a derivation of equation (4).

If the male wage structure is the no-discrimination wage structure then $b = b^M$ and equation (6) reduces to equation (5). If the female wage structure prevails in the absence of discrimination (*i.e.* nepotism towards males exists) then $b = b^F$. Equation (6) reduces to an equation similar to (5) except that the differences in productivity are weighted by b^F and the differences in returns are weighted by X^M.

Alternatively, Neumark derives a no-discrimination wage structure from the original Becker model where discrimination is a result of employer's tastes in a perfectly competitive market. This leads to a new coefficient b^* which is the coefficients of a pooled regression of males and females. Neumark (1988) and Drago (1989) found that estimates of discrimination using b^* gave them results outside the Oaxaca range indicating that the bounds may not be accurate. The problem of which method to choose is taken up in the next section.

In this paper three regressions containing human capital (H), demographic (D) and job variables (J) will be estimated and the coefficients and the means of the variables will be substituted into the Oaxaca-Neumark decomposition (6). This will determine the extent to which productivity differences and discrimination determine wage differentials under the three no-discrimination wage regimes

$$\ln w_i^s = b_0^s + \sum_{r=1}^{k} b_r^s H_{ri}^s + \sum_{g=1}^{h} b_g^s J_{gi}^s + \sum_{p=1}^{q} b_p^s D_{pi}^s + \varepsilon_i^s \tag{7}$$

where s represents the male, female and pooled equations. The human capital variables are schooling, tertiary education fields and potential experience. The demographic variables are marital status, children status and county of birth and the job variables are occupation, industry and public/private sector.

There is however, no shortage of controversy surrounding the use of such a technique. The technique has been principally criticised for its failure to provide any information on discrimination (Butler, 1982). As a result two crucial assumptions are made in the estimation, but relaxed in the interpretation. First, that discrimination is the residual between wages and productivity. This is perhaps difficult to justify considering that the model is only loosely linked to Becker's theory of discrimination which has itself been seriously questioned (Lloyd and Niemi, 1979). Secondly, it is assumed that the specified variables reflect productivity. This is somewhat doubtful considering the crudeness of the variables, their scarcity and often the lack of theoretical justification for them.

Associated with the above, is the problem of feedback effects where productivity investments may be strongly influenced by discrimination. Bergmann (1989) amongst others contends that women's poor choices of vocation, occupation and industry and their desire for less work experience is a result of discrimination which lowers the returns for these investments. This is a prediction of human capital models and the reduced-form equation ignores such causal links.

Fuchs however, has argued that women choose to be the 'wife, mother and home maker' as a result of 'biology and culture' (Fuchs, 1989, p.28-29). They restrict their choices to jobs that contain low and flexible hours of working, little effort, and an ease of entry and exit over time. It is a rational 'supply-side' choice. Becker (1993) argues that if women are marginally less valuable

in the labour market than their spouses family utility is maximised by the husband working and the women investing her time in the household. Therefore, in decomposing the wage gap it must be assumed that discrimination does not affect human capital choices (Butler, 1982).

Lastly, the use of cross-sectional analysis ignores the effects of institutions, technology and changes in the labour market over time (Withers, 1983). The analysis however, does have value in including other variables such as human capital and allowing an examination of wage distributions across individuals (Chapman and Miller, 1983). Furthermore, the persistent nature of the gender wage gap reveals that cross-sectional analysis is not as biased as it would be in other applications. The *effective* dependent variable, the wage gap, shows little variation.

While there are considerable doubts about the method, it does provide a powerful means of breaking down gross wage differentials. It also provides a clearer understanding of some of the forces generating wage differentials which are often ignored in alternative approaches.

III. Data and Regression Results

The data set used in this study was obtained from the 1989-90 ABS Income and Distribution Survey involving a sample of 30,444 individuals for the last week in June 1990. A sub-set of 6775 men and 3462 women working full-time was extracted from the survey. Those self-employed, unemployed, not in the labour force, studying full-time or over 64 years of age were excluded. Appendix B presents the statistical characteristics of the sample.

The hourly wage dependent variable was constructed by dividing weekly wages by weekly hours. This resulted in an average hourly wage of $13.21 for men and $11.17 for women. This translates into a gender wage gap of 15.46 per cent.

Like Chapman and Mulvey, the variable total education, represents the years of total education where tertiary qualifications were converted into year equivalents (see Appendix A). Women have marginally higher levels of total education. For most of the analysis however, the schooling variable, which represents primary and secondary schooling, was combined with tertiary education field dummy variables to obtain an alternative measure of education. The imbalance amongst the vocations is quite substantial. Men were heavily concentrated in the physical trades and science/engineering/architecture vocations while women were concentrated in social sciences, nursing/health and secretarial vocations . A Duncan index calculated for the tertiary fields reveals that 30 per cent of women or men would have to change fields to achieve an equal distribution.[6]

The potential experience variable is measured by subtracting years of total education and five years of pre-education from the age of each individual. In constructing this variable it assumed that labour experience is uninterrupted once full-time education has ceased. Women's intermittent workforce participation, however, results in potential experience being a poor measure of their actual experience. Chapman and Miller (1983) and Chapman and Mulvey (1986) circumvented this problem by adjusting female potential experience using aggregate participation rates and found similar results to Rummery (1991) who used actual work experience. This present study follows Gregory and Daly (1990) by using potential experience and including a children status variable to capture the effect of child-rearing on women's labour force experience. This approach yields fairly accurate results as will be demonstrated in Section IV(b).

[6] See McConnell and Brue (1992, p. 364-5)

The demographic variables reveal that women in full-time employment were more likely to be unmarried with no children whereas males were more likely to be married with dependent children. The job variables reveal a high level of segregation.[7] The majority of men were concentrated in managerial, trades person and labouring occupations while women were concentrated in clerical, sales and professional occupations. The professional figures were to a large extent misleading as 53 per cent of women professionals were teachers and 56 per cent of male professionals were businessmen, engineers and doctors in 1989.[8] Women were concentrated in the community services, wholesale and retail, and finance and property industries while men were more evenly concentrated across industries. Women were also slightly dominant in percentage terms in the public sector.

Appendix C presents the regression results for the male, female and pooled samples.[9] The R^2 statistics of 0.39, 0.36 and 0.38 for the three respective samples were fairly reasonable for cross-sectional human capital analysis and almost all of the variables were significant at the 0.01 per cent level. The sample size was too large to allow a full White (1980) test for heteroskedasticity. Following Maddala (1992), a simple White test and Glejser test was conducted. Both tests rejected the alternative hypothesis of heteroskedasticity. The coefficients are thus efficient and the tests of significance valid.

The results indicate that men receive higher returns on schooling while women receive higher returns on potential experience. This conforms with prior studies. Women in non-traditional vocations such as physical trades, science and medicine/law received significantly more than women in traditional vocations (except for nursing/health and service trades). Men however, in non-traditional vocations such as secretarial and nursing/health and services trades did very poorly compared to traditional male occupations of science, physical trades and medicine/law.

Married and separated women received slightly higher earnings than single women and having children of any status was a significant disadvantage. Women from America, United Kingdom, and Italy had marginally higher earnings than women from Australia and other countries. Women in managerial, professional, para-professional and clerical occupations received significantly higher wages than other occupations. Women in secondary and commercial service industries received higher wages than women in other service industries as did women in the public sector.

Married men received significantly higher wages than single and separated men and having children disadvantages men less than women. Asian men received significantly lower wages than other men as did tradespersons, salespersons, plant operators and labourers. Wages for men in the mining industry were significantly higher than other industries while men in community services and agriculture did commensurately worse. Like women, male public sector employees were better remunerated.

[7] There is a Duncan index of 38 per cent for the occupational distribution and 30 per cent for the industrial distribution.

[8] Australian Bureau of Statistics (1989), *Labour Force,* Catalogue No. 6210.

[9] The dummy variables excluded to allow estimation are no tertiary qualification, single, born in Australia, no children, labourers and related workers, recreation and personal services and private sector.

IV. Decomposition of the Wage Differential

a) Decomposition results

The decomposition of the wage differential reveals that the choice of no-discrimination wage structure is very important. Using Neumark's no-discrimination wage structure, 49 per cent of the wage differential is attributable to discrimination and 51 per cent is due to differences in productivity. The male wage structure provides similar results with discrimination and productivity differences accounting respectively for 61 per cent and 39 per cent of the differential. When the female wage structure is used discrimination accounts for the entire differential.

TABLE I
Decomposition of Wage Differential[a]

	Neumark (%)	Male (%)	Female[a] (%)
Total Discrimination	49	61	103
Total Productivity	51	39	-3
Productivity Breakdown			
Human Capital Total	*33*	*24*	*45*
School	-4	-4	-4
Potential Experience	16	15	13
Tertiary Field	21	13	35
Demographic Total	*3*	*4*	*-5*
Marital Status	4	6	1
Children Status	-1	-2	-6
County of Birth	0	0	0
Job Total	*16*	*11*	*-42*
Occupation	-9	-13	-45
Industry	28	27	5
Sector	-3	-3	-2

Note: [a] Productivity breakdown does not sum to total productivity due to rounding errors. Michael Kidd from the University of Tasmania found a similar phenomenon.

Despite the female wage structure revealing that women were disadvantaged by their lack of human capital (47 per cent) Table I shows that women were more than compensated for this by their advantageous occupational distribution. This advantage comes almost entirely from women's dominance in the clerical occupation. When the female wage structure is used the female coefficients are used to weight the productivity differences (see equation 6). Since women receive high returns for clerical work the female wage structure weights this difference very heavily resulting in occupation differences contributing minus 43 per cent to the wage gap.

For the remainder of the analysis the Neumark wage structure and male wage structure will be used as; (i) discrimination is more likely to occur than nepotism, especially in light of the historical precedent set by the Harvester judgment where women's wages were calculated as a percentage of

males wages[10] (ii) women are in classifications and occupations where the work is the same or similar to men's work but has been undervalued by the Arbitration Commission, unions and employers (iii) discrimination often occurs through job promotion and nepotism in the economic sense would imply that in its absence, very few workers would be promoted (iv) the Neumark method has stronger theoretical justification and (v) the Neumark and male wage decomposition's were almost identical.

As a result we observe that 40-50 per cent of the wage differential would be eroded if females possessed the same human capital, demographic and job distributions as males.

We now decompose the productivity differences to inspect which variables contribute most to this 40-50 per cent. The human capital variables account for 32.66 per cent (Neumark) and 23.91 per cent (Male) of the wage gap where differences in schooling slightly advantage women. Potential experience differences in spite of measurement problems account for 15-16 per cent of the wage gap and this is most probably a result of the dominance of younger women in the full-time labour force.[11]

Tertiary education field differences in the Neumark and male structure explain 21 per cent and 13 per cent of the wage gap respectively. Closer analysis revealed that while women gain from investments in social sciences and nursing/health they were severely disadvantaged by not undertaking education in physical trades and sciences. Interestingly differences in other vocations have little impact on the wage gap. Therefore, women's lack of training in the areas of science and maths (both theoretical and applied) greatly disadvantages them.

In testing how effective the tertiary education field variables were in comparison to the total education variable used in most studies, the whole procedure was repeated using the latter variable. The result was fairly self-evident with the contribution of productivity differences falling about ten per cent. Conservatively, the inclusion of a tertiary field variable increases the explanatory power of the model by about ten to twenty per cent. Removal of this imbalance would probably also have an impact on the occupational and industrial distributions.

Demographic variables however, contribute very little to the wage gap (five per cent) with only men's higher incidence of marriage having any significant effect (six per cent). The children status variable indicates that women were slightly advantaged by having less children. Appendix C shows however, that women receive significantly lower returns after having children. Therefore, the problem is not that women are concentrated in families where there are children. Rather, it is the fact that they receive lower returns in the labour market relative to men after there is a child in the family. This issue will be taken up below.

The job variables account for 15.75 per cent (Neumark) and 10.82 per cent (Male) of the wage gap. Like most studies women were advantaged by their distribution across a broad range of occupations (see Rimmer, 1991). This is because, females receive very low wages in occupations dominated by males. A redistribution of women into these occupations would lower the average female wage. This paper unlike Chapman and Mulvey (1986) and Gregory (1990) found that the industry distribution

[10] This was for the basic wage in female occupations. Women's marginal wages for skill also followed a similar pattern (Short, 1986).

[11] Women in the full-time workforce are significantly younger and less likely to be married or have children than women in the part-time workforce. Potential experience for the women employed full-time is not as biased as would be expected if all women workers were analysed.

has a significant effect on the wage gap (27-28 per cent). More detailed examination reveals that women, while advantaged by their concentration in Finance and Property, were disadvantaged by their under-representation in the mining, manufacturing, construction and transport industries.

Job distribution however, may be a result of discrimination itself. Another set of regressions were run with the exclusion of job variables. The effect was merely to increase discrimination by the same amount that job variables had affected the productivity component. If job variables are a result of discrimination as opposed to a human capital choices[12] then differences in productivity account for 30-38 per cent of the wage gap.

Chapman and Mulvey found that differences in productivity explained 23 per cent of the wage gap where the major factors were potential experience and job tenure. The current study has found that 40-50 per cent of the wage gap can be explained with differences in potential experience, tertiary education choices and industry distribution being the major factors. The remainder of the wage gap is employer discrimination.

b) Validity of decomposition results

Section II outlined the controversy over the decomposition procedure. There are essentially two conflicting schools of thoughts who both claim the decomposition procedure misrepresents the true causes of the gender wage gap. They each have a negative and a neutral argument. The first school of thought, is primarily neoclassical. They argue, negatively, that the discrimination figure is overstated because of the misspecification of human capital variables, particularly women's work experience. They argue, neutrally, that the productivity figures are otherwise correct and are not affected by employer discrimination. The structuralist school of thought argues the opposite. They argue, negatively, that the discrimination figure is understated because discrimination has a feedback effect on human capital accumulation. They argue, neutrally, that the misspecification of human capital variables is not otherwise significant.

This controversy has been tested in two ways. Firstly, a better measure of women's work experience has been used. Chapman and Mulvey's adjusted potential experience measure increased the explanation of the wage gap from 23 per cent to 48 per cent. Rummery (1992), as noted in Section II, found that actual experience accounted for 30 per cent of the wage gap. While this supports the neoclassical claim regarding the understatement of productivity differences it should be noted that discrimination still accounted for 50-70 per cent of the wage gap in the respective studies.

Secondly, Nevile and Tran-Nam (1992) tested the neoclassical claim by examining the returns on the demographic variables. Appendix C shows that women received significantly lower returns for being married or having children. This indicates that the sexual division of labour within the home, specifically the traditional role of married women rearing children, has a negative impact on women's work experience. In analysing the discrimination figures breakdown, which is not reported, 20.5 per cent of the 61 per cent discrimination figure was the result of women receiving lower returns for being married or having children.[13] However, the lower returns may be the result of employers imposing their own preferences by employing married men over married women (Nevile and Tran-Nam, 1992). This conclusion supports the neutral claim of the structuralists that the human capital variables are not misspecified.

[12] See Thurow (1970, p.28-30).

[13] Using the male base. For the Neumark base it was 15.3 per cent of the 49 per cent discrimination figure.

The controversy, however, can be tested in a more conclusive way by testing the two claims in the same framework. The results of this test indicate the negative claim of each school is not supported giving support to the findings in this paper.

The sample is firstly divided into workers with children and those without children. It is assumed that workers with no children, are not expecting to have children in the future or will not leave work to raise children. With the expansion of child-care, flexible work arrangements and the present attitudes of young working women this assumption is not unreasonable. Their accumulation of human capital, therefore, will not, be adversely affected.

The decomposition procedure was run for each sample. Table II shows that there is a higher level of discrimination exercised against those women who do not have children. This discrimination figure is unlikely to be overstated since the potential experience measure should be a good measure of actual work experience as these women are unlikely to have left the labour force. Indeed, the results showed that female workers without children were less disadvantaged by the returns on marriage which tends to pick up unmeasured experience as noted above. Therefore, female workers without children tend to make human capital investments which bring financial returns similar to male workers.

TABLE II
Decomposition of Children and No Children Samples

	No Children (%)	Children (%)
Total Discrimination	80	51
Total Productivity	20	48
Productivity Breakdown		
Human Capital Total	*14*	*23*
School	-6	-2
Potential Experience	14	11
Tertiary Field	6	15
Demographic Total	*-1*	*11*
Marital Status	-1	11
Country of Birth	0	-0
Job Total	*7*	*13*
Occupation	-21	-8
Industry	34	23
Sector	-6	-2

Examining Table III we can see that the wage gap has been split into the productivity and discrimination components using the units of the actual wage gap. The wage gap for those with children is almost twice as large as those without children. The table shows that discrimination exercised against both types of women is very similar, 8.6 per cent and 10 per cent. The difference therefore, between the two groups, is the difference in productivity.

TABLE III
Actual Portions of Wage Gap

Sample	Wage Gap	Cause	Breakdown
Without Children	10.8%	Productivity	2.2 percentage points
		Discrimination	8.6 percentage points
With Children	19.2%	Productivity	9.2 percentage points
		Discrimination	10.0 percentage points

This result lead to the following conclusion. Firstly, that the negative claim of the neoclassical school is somewhat unfounded. The level of discrimination against women without children is only marginally lower than those with children despite the former group possessing a better measure of work experience. In other words the mismeasurement of women's work experience is not significant.

Secondly, the negative claim of the structuralist school, that discrimination is understated because human capital variables are influenced by discrimination, is also dubious. For women without children human capital differences are almost insignificant. For women with children productivity differences account for almost 50 per cent of the wage gap. This would indicate that the decision and consequence of having children leads to women's lower investment in human capital as opposed to labour market discrimination.

The test thus supports the two neutral claims made by the schools and thereby gives credibility to the results and procedure presented in this study.

V. DISCRIMINATION IN THE PUBLIC/PRIVATE SECTOR

Riach and Rich (1987) in their study of employer responses to job applications from men and women who possessed the same human capital found that *employment* discrimination was 25 per cent higher in the private sector. They noted however, that the level of employment discrimination against women in the public sector (13.1 per cent of applicants) is still quite high considering the equal opportunity conventions legislation of the 1970s.[14]

With the Equal Pay decisions of the Arbitration Commission in the early 1970s, the *Sex Discrimination Act* 1984 and the *Affirmative Action Act* 1986 it would be expected that *wage discrimination* against women would decrease in the public sector for a number a reasons: (i) the government would be expected to set an example for the private sector (ii) the public sector can be monitored more easily than the private sector (iii) the *Affirmative Action Act* applies only to

[14] In 1973 the Commonwealth Government ratified Convention III of the International Organization of Labour. The Victorian State Parliament enacted Equal Opportunity Legislation in 1977; the site of their investigations.

employers of many employees[15] and the public sector (whether by department, State, Federal or national level) has on average a larger number of employees than the average private firm and (iv) unions tend to be more dominant in the public sector ensuring that the awards under the Equal Pay decisions are adhered to and that women are protected by the Acts mentioned above. Plowman (1992b), notes that 58 per cent of public sector women are unionised compared to 26 per cent in the private sector.

Rafferty (1991), however, argues that the government has been very slow in implementing the 1972 equal pay decision and that its role as employer tends to dominate its role as social regulator.

In determining the level of wage discrimination in each sector the gender wage gap is decomposed into its different components for each sector. As can be seen from Table IV, the discrimination component in the public sector is marginally higher.

TABLE IV
Decomposition of Public/Private Wage Differential

	Public (%)	Private (%)
Total Discrimination	58	54
Total Productivity	42	47
Productivity Breakdown		
Human Capital Total	*31*	*24*
School	-6	-2
Potential Experience	21	14
Tertiary Field	16	13
Demographic Total	*6*	*4*
Marital Status	6	6
Children Status	-1	-2
Country of Birth	1	-0
Job Total	*5*	*18*
Occupation	-16	-12
Industry	22	30

The wage gap, however, is much higher in the private sector. Therefore, it is necessary, as was done with the no children/children test in Section IV, to express the components in the units of the actual wage gap. This has been done in Table V.

[15] The Act applied to employers of more than 1000 employees in February 1987, 500 employees in February 1988 and 100 employees in February 1989 (Mumford, 1989).

TABLE V
Determination of Discrimination Level

Sample	Wage Gap		Method I Employer Discrimination (percentage points)	Method II Employer & Job Discrimination (percentage points)
Public	12.6%	Productivity	5.3	4.6
		Discrimination	7.3	8.0
Private	18.0%	Productivity	8.4	5.2
		Discrimination	9.6	12.8

Examining the Method I column in Table V, it can be seen that employer discrimination is 2.3 percentage points higher in the private sector. Employer discrimination accounts for 7.3 percentage points and 9.6 percentage points of the gender wage gaps in the public and private sector respectively.

The decomposition figures in Table IV show that job segregation accounts for a much smaller proportion of the total wage gap in the public sector. This job segregation may be the result of discrimination. Since one of the stated aims of the government legislation was to reduce gender segregation (Mumford, 1989), it may be appropriate to include job segregation in the definition of employer discrimination.

In Table V, Method II shows that the private sector has a significantly higher level of discrimination if we include job segregation in its definition. For the public sector discrimination rises to eight per cent but for the private sector it rises to 12.8 per cent. Therefore, discrimination in the private sector is 4.8 per cent higher in than the public sector. It should be noted though, that when the Neumark structure is used this difference is only 3.1 percent.

Whether this 3.1-4.8 per cent difference is due to legislation is open to debate, as it may be just the result of union initiatives or better implementation of the Equal Pay decisions. Theoretically the result is counter to many models of discrimination which hypothesise that monopolies bring higher discrimination.[16] Therefore, the lower discrimination must be the result of institutional factors.

While the result does not resolve the long debate over the impact of legislation on the gender wage gap[17] it does provide some encouragement to its supporters. If we were to take the private sector as the base, then discrimination in the government sector has been reduced by 28-40 per cent.

[16] See Thurow (1975), Cain (1986).

[17] See McConnell and Brue (1992, p.377-381).

VI. Conclusion and Policy Implications

This paper has estimated that 40-50 per cent of the gender wage gap is the result of women's choices concerning human capital, demographic and job status while 50-60 per cent of the wage gap is due to employer discrimination. It was also demonstrated that these figures are not significantly biased as claimed by structuralists and neo-classicals.

Employer discrimination is therefore quite substantial. Riach and Rich (1987) recommend a strengthening of the current legislation. Drawing an analogy with capital markets they suggest that governments could conduct random audits of firms to ensure that employment practices are consistent with existing legislation. In the United States such audits are conducted and lawsuits are filed against firms who fail to promote equal numbers of men and women of the same productivity. The success of this approach is quite debatable. Hoffman and Reed (1982) found that many women in the XYZ firm, which attempted to implement equal opportunity, did not apply for promotions because they did not want the responsibility or they *expected* discrimination.

Another approach would be to encourage the Industrial Relations Commission to re-evaluate the gender bias in their definitions of work value as proposed by the Commission in 1972 (Bennett, 1988). This would redress the institutional element still existing in employer discrimination. In the October 1991 National Wage Case, however, the Commission endorsed the 'enterprise bargaining principle' and a return to centralised work value cases is unlikely.

Sloan (1993) predicts that employer discrimination will decrease through greater flexibility in the labour market. Judging by the evidence of countries with decentralised labour markets this approach will take some time. Removing discrimination through government policies would, as shown above, be more difficult but more likely to expedite the closing of the gap. The government's present encouragement of enterprise bargaining is only likely to aid a few women, particularly in the higher echelons and disadvantage many as the New Zealand experience shows (see Hammond and Harbridge, 1993).

Turning now to the other influential factors, women's lack of labour market experience could be addressed through increases in child-care funding and the extension of maternity leave into the private sector for both sexes.[18] With Australia's recent ratification of the ILO Convention 156 on Workers with Family Responsibilities the Commonwealth Government is now under an international obligation to reconcile the problems that families face in working and raising children (Watts and Rich, 1992).

While this problem is economic through its impact on work experience and wages the division of responsibilities within the home is a complex question beyond the confines of this discipline. Becker (1993) however, argues that it is essentially an economic issue and that the dominance of women in the home can be explained by their comparative advantage (see above).

[18] Watts and Rich (1992). They note that increase in maternity leave may harm women's employment prospects.

The study has also shown that women's choices or restrictions in tertiary education, which also affect their industrial distribution, places them at a significant disadvantage. This disadvantage stems principally from their lack of representation in the physical trades and science/engineering/architecture. The Women's Directorate (1986) in its 'Apprentice Program for Girls' saw a need for employer, union and community education. Historically, women have been restricted entry into many apprenticeships (Short, 1986) as the trade system possessed a high status among the occupations (see Justice Higgins judgments in Plowman (1992a)). The removal of employer and union discrimination would allow more women to enter the trades. The policy however, as noted above, must also be aimed at the supply-side (the community and young women) to break down the expectations formed by tradition.

The government could also encourage women to enter the science related fields. This could be achieved through increased awareness among women in high-school, changing gender-biased teaching methods and perhaps pecuniary incentives. Secondary and mining industries which employ science graduates are generally male-dominated and would need to be encouraged to employ women as engineers, scientists and managers and not merely as ancillary staff.

Turning lastly to the public sector, the results bring further support to the hypothesis that enterprise bargaining will not benefit women as the private sector appears to possess higher levels of discrimination. The difference though between them is perhaps not as large as expected reflecting the government's commitment to restrained wage outcomes and public sector cutbacks. It would appear that the enacted legislation has had some impact.

While more women are pursuing higher education qualifications and greater work experience the gender wage gap, like occupational segregation, is likely persist for a long period of time.[19] The majority of women are still entering traditional vocations, occupations and industries, unable to acquire the necessary work experience due to the raising of children and continually facing prejudiced employers and workplaces.

APPENDIX A

Tertiary Qualification	Year Equivalent
Trade	0.25
Other qualification	0.25
Diploma or three year degree	0.50
Engineering degree	3.00
Law degree	5.00
Architecture and Medicine degree	6.00

[19] Lewis (1982) predicts little change in occupational segregation by the year 2001.

APPENDIX B

TABLE B1
Summary Statistics

	Men		Women	
Variables	Mean	Std. Dev	Mean	Std. Dev
Ln Wage	2.50	0.41	2.35	0.37
Wage	13.21	5.47	11.17	3.88
Schooling (P & S)[a]	11.04	1.62	11.26	1.39
Total Education	11.48	1.97	11.58	1.55
Potential Experience	19.48	12.37	16.34	11.58
(Potential Experience)^2	532.53	575.04	401.04	479.61
	Percentage	Sum	Percentage	Sum
Tertiary Education Field				
Social Science	6.34%	429	15.41%	534
Science & Eng & Arch	10.00%	678	3.41%	118
Commerce	6.76%	458	6.29%	218
Medicine & Law	1.26%	85	0.99%	34
Nursing & Health	0.93%	63	7.83%	271
Physical Trades	21.07%	1428	0.20%	7
Service Trades	3.39%	229	1.65%	57
Secretarial	0.28%	19	12.51%	433
Other Qualification	3.32%	225	2.38%	82
No Qualification	46.66%	3161	49.35%	1708
Marital Status				
Married	67.66%	4584	55.72%	1929
Separated	4.86%	329	9.74%	337
Single	27.48%	1862	34.54%	1196
Country of Birth				
United Kingdom	9.13%	619	8.16%	282
Italy	1.80%	122	1.35%	47
Other Europe	6.36%	431	4.55%	158
Asia	5.05%	342	5.24%	182
America	1.16%	78	0.98%	34
Africa	0.98%	67	1.20%	41
Oceania	2.62%	177	3.09%	107
Australia	72.90%	4939	75.43%	2612

Note: [a] P – Primary, S – Secondary

	Men		Women	
	Percentage	Sum	Percentage	Sum
Children Type				
Dependent Children	35.50%	2405	22.25%	770
Non-Dependent Children	16.56%	1122	17.95%	621
Dep & Non-Dep Children	13.07%	885	14.37%	497
No Children	34.87%	2362	45.44%	1573
Occupation				
Managers & Admin	9.84%	666	4.59%	159
Professional	13.71%	929	17.92%	620
Para-Professional	7.70%	521	7.84%	271
Trades persons	23.75%	1609	3.09%	107
Clerks	9.31%	631	37.53%	1299
Sales persons[b]	7.67%	520	16.48%	571
Plant Operators	11.69%	792	3.66%	127
Labourers & Related	16.33%	1106	8.89%	308
Industry				
Primary - Land[c]	2.40%	163	0.81%	28
Primary - Mining	2.56%	173	0.28%	10
Manufacturing	23.63%	1601	13.11%	454
Electricity, Gas & Water	3.07%	208	0.76%	26
Construction	8.54%	579	1.36%	47
Wholesale & Retail	16.15%	1094	16.47%	570
Transport & Storage	7.50%	508	2.71%	94
Communication	3.19%	216	1.98%	69
Finance, Property, Business	9.14%	619	17.74%	614
Public Admin, Defence	8.08%	548	7.15%	248
Community Services	12.07%	818	31.46%	1089
Recreation & Personal	3.67%	248	6.16%	213
Sector				
Government	30.42%	2061	35.01%	1212
Private	69.58%	4714	64.99%	2250
Sample Size		6775		3462

Notes: [b] and personal service workers

[c] agriculture, forestry, fishing and hunting

APPENDIX C

TABLE C1
Regression Results

Variables	Male Coeff	Std. Err.	Female Coeff	Std. Err.	Pooled Coeff	Std. Err.
Intercept	1.6019 *	(0.043)	1.5174 *	(0.061)	1.1524 *	(0.035)
Schooling (P & S)	0.0266 *	(0.003)	0.0251 *	(0.005)	0.0295 *	(0.003)
Potential Experience	0.0259 *	(0.001)	0.0312 *	(0.002)	0.0273 *	(0.001)
(Potential Experience)^2	-0.0004 *	(0.000)	-0.0006 *	(0.000)	-0.0005 *	(0.000)
Tertiary Ed Field						
Social Science	0.0665	(0.019)	0.0437	(0.020)	0.0469	(0.014)
Science/Eng /Arch	0.1767 *	(0.016)	0.1441 *	(0.031)	0.1893 *	(0.014)
Commerce	0.1538 *	(0.017)	0.0814	(0.023)	0.1397 *	(0.014)
Medicine & Law	0.4572 *	(0.037)	0.3805 *	(0.055)	0.4467 *	(0.031)
Nursing & Health	0.1043	(0.043)	0.1517 *	(0.025)	0.1221 *	(0.021)
Physical Trades	0.0939 *	(0.012)	0.2869	(0.114)	0.1245 *	(0.011)
Service Trades	0.0782 *	(0.023)	0.1306	(0.042)	0.1000 *	(0.020)
Secretarial	0.0222	(0.075)	0.0190	(0.017)	-0.0100	(0.017)
Other Qualification	0.0473	(0.023)	0.0604	(0.034)	0.0618	(0.019)
Marital Status						
Married	0.0991 *	(0.013)	0.0175	(0.018)	0.062 *	(0.010)
Separated	0.0467	(0.022)	0.0246	(0.025)	0.015	(0.015)
Country of Birth						
United Kingdom	0.0341	(0.014)	0.0357	(0.019)	0.0332	(0.011)
Italy	-0.0112	(0.030)	0.0228	(0.046)	-0.0127	(0.026)
Other Europe	-0.0296	(0.017)	-0.0151	(0.026)	-0.0336	(0.014)
Asia	-0.0798 *	(0.019)	-0.0115	(0.024)	-0.0665 *	(0.015)
America	0.0412	(0.037)	0.0550	(0.052)	0.0457	(0.030)
Africa	-0.0173	(0.040)	-0.0407	(0.047)	-0.0303	(0.031)
Oceania	0.0432	(0.025)	0.0106	(0.030)	0.0301	(0.020)

Note: * Significant at the 0.01 per cent level

Variables	Male Coeff	Std. Err.	Female Coeff	Std. Err.	Pooled Coeff	Std. Err.
Children Type						
Dependent Children	-0.0318 *	(0.011)	-0.0879 *	(0.014)	-0.0302 *	(0.009)
Non-Dep Children	-0.0511 *	(0.012)	-0.0849 *	(0.015)	-0.0635 *	(0.010)
Dependent & Non-Dep Children	-0.0655 *	(0.013)	-0.1051 *	(0.016)	-0.0757 *	(0.010)
Occupation						
Managers /Admin	0.2852 *	(0.017)	0.3131 *	(0.031)	0.2966 *	(0.015)
Professional	0.2702 *	(0.018)	0.3453 *	(0.027)	0.2748 *	(0.015)
Para-Professional	0.2133 *	(0.018)	0.2893 *	(0.030)	0.2285 *	(0.016)
Trades persons	0.0468	(0.014)	-0.0020	(0.037)	0.0585 *	(0.013)
Clerks	0.1108 *	(0.017)	0.210 *	(0.022)	0.1025 *	(0.012)
Sales persons	0.0397 *	(0.019)	0.0928 *	(0.093)	0.0247 *	(0.014)
Plant Operators	0.0207	(0.015)	-0.0117	(0.033)	0.0254	(0.014)
Industry						
Primary - Land	-0.1956 *	(0.033)	-0.1214	(0.061)	-0.1514 *	(0.028)
Primary - Mining	0.4755 *	(0.033)	0.1818	(0.010)	0.5041 *	(0.029)
Manufacturing	0.1415 *	(0.023)	0.1176 *	(0.027)	0.1585 *	(0.017)
Electricity, Gas, Water	0.1538 *	(0.033)	0.1589	(0.064)	0.1950 *	(0.028)
Construction	0.1793 *	(0.026)	-0.0788	(0.049)	0.1983 *	(0.020)
Wholesale/Retail	0.0606	(0.023)	0.0407	(0.026)	0.0825 *	(0.017)
Transport /Storage	0.1051 *	(0.026)	0.1051	(0.039)	0.1500 *	(0.021)
Communication	0.0921	(0.033)	0.0591	(0.045)	0.1144 *	(0.026)
Finance, Property	0.1609 *	(0.025)	0.1353 *	(0.026)	0.1804 *	(018)
Public Admin, Defence	0.0740	(0.028)	0.0832	(0.033)	0.1112 *	(0.021)
Community Services	-0.0479	(0.026)	0.0002	(0.027)	-0.0164	(0.019)
Sector						
Government	0.1023 *	(0.014)	0.0796 *	(0.015)	0.0971 *	(0.010)
R-Squared	0.39		0.36		0.38	

*Note:** Significant at the 0.01 per cent level

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