

Gender differences in occupational wage mobility in the 1958 cohort

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ABSTRACT

This paper examines the wage growth of British men and women between the ages of 33 and 42 who were employed full time at both of these ages. The data are from the employment histories of the 1958 National Child and Development Study. Our selection of full timers focuses on the part of the labour market where one might most expect men and women to be treated equally. It meant that our sample contained the high flyer career women who were highly educated, more so than the men, less likely to be partnered, less likely to have a child than both the men's sample and the rest of the women in the cohort at age 42 and more likely than other women to have had continuous full-time employment. Wage growth is examined in the differences of the log of hourly wage rates reported at the 33 and 42 year old interviews of this cohort study, and by examining the age 42 level of wages, controlling for age 33 wages. Over this period, the raw wage growth was 16.2 per cent for women whereas men's wages grew by 22.4 per cent. Growth was much higher for men than women at the highest wages. A variety of explanatory variables were included to capture occupations, occupational mobility, occupational gender segregation, changes in human capital and family and demographic circumstances. The main explanations of gender differences in wage growth were found in the wage rewards to men of certain occupations with higher rates of pay and male occupational gender segregation. In addition, men were more likely than women to be in these higher wage growth occupations. Women's wages grew more slowly over the period than men's wages because they were located disproportionately in feminised jobs which experienced slower wage growth. Where women were in top occupations, they also experienced slower wage growth than the men in these occupations. Domestic ties and downward occupational mobility did not appear to explain the differences in wage growth for this group over their thirties, where the occupational penalties of gender widened.

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1. Introduction

Men and women are known to have different wage rates in the labour market of most European countries. Although the gender wage gap has been declining over time, it has not gone away (Kingsmill, 2001, Women and Work Commission, 2006). The difference between rates of pay remains between women in part-time jobs and men in full-time jobs, and within the full-time labour force, which features in headline measurements of the pay gap. Equality seems more elusive among workers in mid-life than in their twenties. It is tempting to draw the conclusion that unequal pay is being phased out, and will disappear as the younger generation grows older, the 'cohort replacement' theory. However, this conclusion would be premature. It is important to understand how far the pay gap among mature workers in full-time employment is to be explained by women at these ages having less earning power than men, for example, if they have less continuous employment records or fewer qualifications, and how far the labour market is remunerating equivalent characteristics unequally. It is also possible that the apparently equal pay of younger workers may yet hide unequal remuneration of women's increasingly superior qualifications. The focus of this paper is on whether and how a key group of employees, born in 1958, fared as they moved across their thirties.

Previous analysis of the 1958 cohort data (Joshi et al 2007) found that for the admittedly select group of workers who had been in full-time employment at both age 33 and age 42 surveys, the relative pay of men and women grew wider. The cohort replacement theory would predict this gap would remain constant over time (variation would be between cohorts, not along the life course within them). Women employed full time at both these ages were found to experience increasingly unequal treatment, given their human capital.¹ This paper takes up the story by focusing on the wage growth of the employees observed twice, and looking beyond human capital characteristics to the occupational and family context of these trajectories to try to understand why women's pay fell behind, even for a group where one might least expect it to.

Real wage growth can occur in a number of ways – through remaining in one occupation, and possibly moving up set salary scales, by changing job within the same occupation, or changing job and occupation. Individuals who move jobs may have more potential to improve their wages

¹ This was based on the relative rates of remuneration for abilities, qualifications and employment experience estimated in models fitted to all full-time workers. The mean of the index of unequal treatment for 989 women who were full-time employees at two surveys, is 15.7% at age 33 and 20.0% at 42, an increase of over 4%, for all women.

and experience wage growth. However, they may also suffer slow wage growth or even wage decline. Occupational change can be thought of as a route through which the accumulation of human capital is rewarded, or failure to maintain it is penalized. Particularly in the face of gendered occupational segregation, it is pertinent to enquire if these rewards and penalties affect men and women equally. Most analyses of the gender wage gap have focused on explaining the different wage levels, often at a point in time. However, an analysis of wage growth incorporates a more dynamic element into the explanations of gender wage gaps.

In the rest of this paper we review the existing literature on the gender wage gap (Section 2). In section 3 we outline our models. Section 4 describes the available data. Sections 5 and 6 discuss the results and our conclusions are presented finally in Section 7.

2. Earlier studies – explaining the gap.

Concerns with gender differences in pay have led to a series of studies attempting to understand the size and causes of the gap in wages between employed men and women (Wright and Ermisch, 1991; Joshi and Paci 1998; Anderson et al, 2001; Manning and Swaffield 2006; Joshi et al 2007). Taking a human capital model as the basis for earnings analysis, Zabalza and Arrufat (1986) suggested that the gender gap could mainly be attributed to women who interrupted their employment histories for ‘home time’, which they imputed on the basis of children born. However, Wright and Ermisch (1991), analysing actual employment histories of married men and women in the Women and Employment Survey, found unequal remuneration for education and experience also contributed to the pay gap, as did low pay in part-time jobs (Ermisch and Wright, 1993; Manning and Petrongolo, 2004). The analyses of the 1946 and 1958 cohort data presented by Joshi and Paci (1998) found unequal remuneration for human capital between male and female full timers, and between women working full and part time. Their index of unequal treatment among full timers in their early thirties fell from 24 per cent in 1978 to 17 per cent in 1991.

Other authors introduced further information to account for gender wage differences, for example, human capital differences of education, qualifications, work experience, part- or full-time working, training, travel to work distances, firm size, and unionization differences. These all help to account statistically for the wage gap (Anderson, 2001; Joshi and Paci, 1998; Paci et al, 1995). In addition, the extent of occupational segregation in the jobs held by men and women also explains a part of the gap. It is also supposed that occupational segregation keeps

women's wages low even for full-timers, in that it is more difficult to implement the 1986 Equal Pay for Equal Value legislation where there are few male comparators. Also, women may be crowded into these fields, thereby keeping pay low. Occupation is a determinant, or at least a correlate, of pay. Sex segregation of an occupation might lower pay for both women and men. When segregation is recorded at the level of the workplace, there is some evidence of a pay penalty to working in a feminized workplace (Millward and Woodland 1995). Hakim (1998) concluded that vertical sex segregation is much more important than horizontal segregation across occupations, accounting for around three quarters of the gender earnings differential. This implies that women's earnings were held back more by their failure to make occupational advances than by their choice of, or selection into, stereotypically female types of job on entry to the labour market. It is difficult to disentangle the pay penalty attached to working part time from the low status types of job which have hitherto been offered on a part-time basis. These include low-skilled jobs in shops, cleaning and other services, typically occupations for women, often associated with no training, insecure contracts, and low unionization.

A worker's family position may be a relevant factor in generating pay differentials, but it is not clear exactly what the relationship may be. On the one hand, responsibility for supporting children, elders or a spouse may give a worker more incentive to work productively. The employer may recognize or even encourage a breadwinning role by offering a 'family wage', and the 'dependents' may actually, through their non-market inputs, enhance the worker's productivity. On the other hand, family responsibilities may detract from productivity, be perceived as making workers less reliable or motivated, may reduce bargaining power in the labour market, confine the worker to low paid part-time work or lead to intermittent employment experience. It is also possible that people in a given family status happen to have high or low wages for other reasons. High earners may find it easier to find and keep a spouse for example. Greater family responsibilities have tended to be associated with higher wages for men (Akerloff, 1998) and lower wages for women, mirroring and possibly reinforcing, gender differences in family roles. Greenhalgh (1980) and Davies and Peronaci (1997) attempted to disentangle productivity and selection in the marital status differentials in men's wages. Joshi and Paci (1998) failed to find much direct impact of motherhood on women's pay after allowing for its indirect effects through work experience and part-time employment. When models of the pay gap which do not control for family responsibilities find an unexplained gap between men's and women's pay, one reason may be the asymmetrical effects on wages of family responsibilities.

The gender pay gap has also been found to vary across ages and across the wage distribution (Arulampalan et al, 2006), being higher at the top and bottom ends of the distribution. The gap can in principle be created in a number of ways; by men having more favourable market characteristics than women; by men being rewarded more favourably for their market characteristics than women. The balance of factors may change over time if men's and women's earning attributes change over time, or if the rates at which they are remunerated diverge over time. The latter may come about through differential access to the most remunerative career pathways.

In principle, wage changes within the same employer (or occupation) can enhance wages where there is an internal career ladder. However, it is also possible to progress a career by changing jobs. It is even possible to gain promotion within the same job by getting an outside offer and using it to lever a pay rise in the current job by using the threat of leaving. A series of empirical papers using the British Household Panel Study have examined the effects job changes have on promotion and wage levels (Booth and Francesconi, 1999; Booth et al, 1999; Booth et al, 2003; Blackaby et al, 2005). Booth and Francesconi (1999) reported that among full-timers remaining in the labour force over a 5-year period, men and women had remarkably, and surprisingly, similar chances of promotion. This would appear to suggest that women full-timers were indeed breaking through the glass ceiling, though there is some doubt about how well promotions are identified in the data. Booth and colleagues (2003) then pointed out that women were nevertheless at some disadvantage, as they had higher chances of quitting and gained less wage growth between the rungs of the promotion ladder than the men, a 'sticky floor'. They also conjectured, though they could not directly observe, that women's slower wage growth may be due to being less aggressive or less risk taking in the job market.² In a much smaller dataset, on academic economists (mostly full-timers and all graduates), Blackaby et al (2005) found evidence for these conjectures. In this sample, women were less likely than men to receive outside offers, and if they did were less likely to gain from them. They were also less likely than men, for given characteristics and measured productivity to be promoted. The pattern of slower career progression for women employed full time also applies in other parts of the university sector and the mechanism discussed may well apply even more widely. These conclusions are echoed in Manning's (1996) view of the importance of monopsony in the setting of low wages for women. Whether such unequal treatment is 'unfair' or discriminatory is another question.

² Booth et al (2003) argued that women were being treated as 'loyal servants' whose assumed aversion to moving, possibly due to domestic responsibilities, kept their wages down.

Recent papers by Manning and Swaffield,(2006) and Joshi et al (2007) both find that the faster growth of men's wages over the first two decades of labour force years cannot just be explained by men accumulating more employment experience. The rates of pay offered to identical, full-time continuous workers show a greater advantage for men after 10 years or so in the labour market than on entry. Of the 1958 birth cohort members who were employed full time at age 33 and 42, women appeared to suffer as great a growth of unequal treatment at age 42 as those who had more interrupted employment histories (Joshi et al, 2007). This finding forms the starting point of the current investigation.

3. Model

Our main approach to understanding wage growth is through the human capital theory (Becker, 1975; Mincer, 1974). Current wages at time t are expected to reflect earlier investments in an individual's human capital. The most obvious sources of earlier investments are educational qualifications achieved through schooling and work experience and training accumulated since leaving full-time education. Periods out of work are expected to have caused depreciation of the stock of human capital up to that point, as well as halting its accumulation, leading to subsequent declines in the potential wages of those who have been out of the labour market.

There have been a number of discussions and debates about gender differences in human capital accumulation (Dex, 1985). Women, as reviewed above, tend to have lower wage rates than men and in part at least, this is due to different earlier investments in human capital. Wage growth became part of the early debates over whether women expected to have time out of the labour market to have children and consequently invested less in human capital as result. Another alternative, suggested by Mincer and Polachek (1974), was that women would select an occupation bearing in mind their expectations to leave the labour market for a time, and choose occupations that incurred lower penalties (depreciation rates) for time out of work. The issue this raised was that it took for granted a slower rate of wage growth on returning to work after a labour market gap. What if there was a faster rate of wage growth, big enough for women to recoup the losses due to labour market absence? Some evidence emerged to support the idea that wage growth was faster after returns to work (Dex, 1985). However, over time, behaviour has changed quite substantially. Educational qualifications have equalized among young men and women, occupational choices have moved to be more similar, although far from being identical, work experience has not equalized although some women's gaps out of

work for childbirth have drastically reduced, and wages have grown closer (particularly for younger workers).

We focus in this paper on the period from age 33 to 42 and examine wage growth of men and women over this 9 year period. Individuals' wage rates at age 33 embody their past human capital investments up to that point. An examination of wage growth controls for any differences between gender groups up to the starting point by differencing the starting wage from the end wage. However, were there to be any advantage to be gained from having a certain level of human capital at the outset, the model will not necessarily capture this effect.

A number of possible measures of wage growth were considered and the measure we adopted was felt to be the best option for these hourly wage data over this period. Hourly wages were tightly cut off at the lower end of the distribution and had a very long upper tail. We ruled out using the ratio of raw values of men's and women's hourly wages since they were very unlikely to have a Gaussian error term. We also rejected using the measure of the absolute £ per hour difference in wages from age 33 to 42. Since pay rises are mostly in percentage rather than absolute terms, there were likely to be enormous differences between high and low earners. This would imply a multiplicative dependence on the starting wage that would not be adequately modeled by linear regression. We selected, as a better alternative, therefore, the log of the ratio of the end wage over the starting wage. This does not have the problems of the earlier alternatives and is much closer to offering a linear model with Gaussian errors, the model we outline below.

Two main approaches were taken to examining wage growth differences of men and women. In the first approach we modeled the difference in log wages, LN (W), between two points in time t, age 33 (time t-1) and 42 (time t) as follows:

$$\text{LN}(W_t/W_{t-1}) = \alpha_1 + \sum_k \beta_k (X_{kt} - X_{kt-1}) + \sum_j \gamma_j Z_{jt-1} + \varepsilon \quad (1)$$

Where X is a vector of k characteristics that change over the period from t-1 to t, with associated coefficients β , and Z is a vector of j characteristics, with associated coefficients, γ , that represent the initial conditions at the start of the period.

In the second approach, we considered the log hourly wage level achieved at age 42, $\text{LN}(W_t)$, treating the hourly wage at age 33, $\text{LN}(W_{t-1})$, the lagged dependent variable, as one of the regressors, as follows:

$$\text{LN}(W_t) = \alpha_2 + \xi \text{LN}(W_{t-1}) + \sum_k \beta_k (X_{kt} - X_{kt-1}) + \sum_j \gamma_j Z_{jt-1} + \varepsilon \quad (2)$$

For the independent variables, Z , attached to the start of the period, $t-1$, we were mindful that using the wage difference as our dependent variable would already have controlled for the obvious determinants of wage levels. None the less, we considered it likely or possible, given occupation by age trajectories, that certain occupations (and possibly education levels) might have different wage growth paths. In addition, since high earners, overlapping with high occupations, are often able to command higher pay rises, we needed to capture this phenomenon. We included occupation codes at $t-1$ as dummies, therefore, to capture these effects.³ In addition, we included an indicator of whether the occupation was mainly dominated by women, men or integrated across men and women (the reference group was mainly female dominated).⁴ It was also possible that living with a partner or dependent children at base year would affect the extent to which individuals focused on their job and gaining promotion over the next 9 years. Stereotyped expectations here would be that having a partner and having a dependent child at $t-1$ would each motivate men to gain more promotion and wage growth, whereas they may impede women from pursuing their career. Partner and dependent child were entered as time $t-1$ dummy variables.

For independent variables, X , indicating change from time $t-1$ to time t , we included measures of human capital accumulation and depletion from the work histories of the individuals in the data. Dummies were included for additional training spells of 3 days or more, gaining an additional educational qualification, any periods out of the labour market, or spells of part-time work, and whether there had been changes in 'jobs', to capture some of the earlier findings in the literature reviewed above.

³ Education qualifications were also entered into the model, but overlapped to a considerable extent with the occupation indicators, reducing their significance while not adding anything to the model. A number of studies have argued that education affects occupation mobility, with higher mobility and promotion resulting from higher education (Harper, 1995; Sicherman and Galor, 1990). However, these earlier studies did not also include occupations. Occupations clearly encompass educational qualifications to a large extent, and are more closely related to the alternative career paths in or between organisations. Highest education dummies were also tried in the model instead of occupations, but did not perform as well and so were dropped from the final versions.

⁴ Occupations were classified as mainly male or mainly female if they had a 70% share or more male (or female) employees in that occupation. Integrated occupations were the rest.

Our data on job changes did not contain information about whether individuals stayed with the same employer. However, we consider that changes of occupation category are most likely to indicate a change of employer. We included, therefore, a dummy variable for an upward change in occupation from the origin occupation at time t-1 to the destination occupation at time t. Similarly, a dummy for a downward occupational move over this period was also included. A third dummy indicated the individual reported a job change over the period, but no occupation change. Thus the omitted reference group is the group who stayed in the same occupation **and** did not change their job. This does not fully capture employer versus internal jobs changing, but it is a reasonable approximation. It has the added benefit of allowing us to incorporate the direction of occupational change.⁵

In addition changes in partner status and the addition of a new birth over the period were also included as another block of dummy variables. Several other variables were also tried but discarded because of their lack of significance.⁶

Both models were estimated using OLS regression. In the first instance models were run using the combined sample of men and women, using a dummy indicator to capture gender differences in the intercept. We then estimated the models separately for men and women to allow for coefficients to vary by gender. Variables were entered in blocks in order to see whether one set moderated the effects of others. Four blocks of variables were entered, (1) capturing occupations at outset, (2) occupational change and occupational segregation, (3) changes in human capital, and lastly (4), family partner and ill health variables. We did not run a model in human capital at age 33, partly because this was covered in the earlier analysis (Joshi et al, 2007), and partly because human capital at age 33 was factored out in our wage growth model (equation 1) and controlled by the inclusion of wages at age 33 in our age 42 wage levels model (equation 2).

4. Data

⁵ The vertical scale used is indicated in Appendix 1, and was devised by calculating the mean wage of SOC 1990 major groups, and ranking them accordingly.

⁶ Dummy variables were used to capture excessively large (or small) gaps between the two interviews which may have increased (or reduced) the length of the growth period. Dummies to recognise plus or minus two standard deviations from the mean inter-interview gap were not significant. We also included attitude measures from age 33 NCDS, but the missing values on these variables substantially reduced our sample size, by several hundred women and the same for men, so we decided to drop these variables.

The data we used to measure occupational wage mobility come from the employment histories of the 1958 British Birth Cohort members, the National Child Development Study (NCDS). NCDS is a nationally representative longitudinal survey of over 17,000 births in 1958 although there has been some drop out, to around 11,000 in 1991 and 2000. Hawkes and Plewis's (2006) examination of attrition and non-response in the National Child Development Study found few significant predictors of attrition. This supports the view that the data are still reasonably representative of this population.

NCDS contains detailed employment, occupational and education histories for its members up to age 42, at the time of writing this paper.⁷ Information about the wages of the employed and their job tenure were only available as concurrent data about jobs held at the survey sweeps, ages 42, 33 and 23. For the age 42 contact/interview, NCDS data achieved 11,419 interviews, 5624 with cohort men and 5795 with the women. The cohort members who gave complete information about their weekly working hours and earnings is less than those who were interviewed at both sweeps of NCDS partly because these data were only available for those employed at the interview, but also because earnings data, not uncommonly, had a higher item non-response than most other questions in the interview. In addition, we decided to focus on those employed full time both at age 33 and at age 42, a sample of 3558 full-time employees, 2606 men and 952 women, with full information on all other variables entered. All wages have been adjusted to reflect inflation changes, all being deflated or inflated to year 2000 values. A full list of the variables used, their means and standard deviations are presented in Appendix Table A1.

These men and women, employed full time at both 33 and 42 varied from the rest of the interviewed sample at age 42 in terms of their qualifications, partnership status and family at age 42. Both men and women in our sample were more highly educated than those who were not working full time at this point, and women were more highly educated than the men; 34.0 per cent of the men in our sample and 39.4 per cent of the women had a qualification at NVQ level 4 or above by age 42. Among those interviewed at age 42, but not in our sample, 20.4 per cent of the men and 21.8 per cent of the women had such degree level qualifications at this age. Men in our sample tended to be more likely to be partnered at age 42 (83.2%) compared with men who were not in our sample (66.1%), and than women in our sample (67.7%) who were also less likely to be partnered than women who were not in our sample (83.6%). Men in

⁷ NCDS member were also contacted at age 46 in 2004, but the data are not yet cleaned and available for use.

our sample (63.9%) were more likely to have a dependent child than men out of our sample (52.4%) and women in our sample were far less likely to have such a child (43.5%) than women out of our sample (82.7%) at age 42. Qualifications, partnership status and having a dependent child appear to be associated with the selection of men and women into this sample, with opposite effects for men and women in the case of family status. Dependent children are particularly uncommon among women employed full-time at both 33 and 42.

The majority of our sample, working full time at 33 and 42, are men (73%). The women are a select group who should be best placed to take advantage of equal pay policy. In focusing on women employed full time at two points in time, we are removing some of the normal variation that occurs in women's wages. Many British women work part time when they have children, and move in and out of the labour market generating an intermittent employment career. Those who were working full time in their thirties are likely to be at the top end of the employment attachment spectrum, working continuously. They will not all be committed high-flyer career women depicted as having higher qualifications and having delayed childbearing, if any, into their thirties. However, the high flyers will be in this group, along with others who are working full time out of financial necessity, and possibly some mothers who had their children early and had returned to full-time employment.

For the sample who were working full time both at age 33 and age 42, women's raw hourly wage rate at age 33 was £8.47 per hour compared with a men's wage rate of £10.10 at the same age and time. By age 42, on an adjusted basis, women's hourly wage rate had increased to £9.84, a 16.2 per cent rise, and men's rates to £12.36, a 22.4 per cent rise.⁸ Thus controlled only for working full time, the female to male ratio for this group started out at 83.9 per cent but declined by age 42 to 79.6 per cent, a fall of 4.3 percentage points over this 9 year period in mid-life.

The means of our dependent wage growth variables (Appendix Table A1) are geometric means; these suggest, unlike the arithmetic means cited above, that there is little difference between men's and women's wage growth, at the mean, over the period, 12 compared with 13 per cent.⁹

⁸ These means differ slightly from those cited for the same data set in Joshi et al (2007 forthcoming), particularly for women at age 42, because of differences in handling 5 outliers. This study has set the £383 hourly wage of a childminder to £3.83 per hour, and has withdrawn a number of cases from the sample classifying them as 'missing'.

⁹ The geometric mean minimizes the effect of extremes (high earners in this case) in its calculation, unlike the arithmetic mean that emphasizes high earners.

However, plotting our wage growth measure over the percentiles of the distribution, rather than solely at the mean, shows there is considerable variation. Figure 1 plots the male to female ratio of wage growth over the percentiles and shows that the growth gap between men and women is much higher at the high paid end over the 9 year period. Figure 2 plots the ratio of hourly wages at age 42 over age 33 and shows that people with high salaries are commanding disproportionate percentage pay rises over the period, up to four times bigger than those in lower earnings. These figures confirm earlier findings of Arulampalam et al (2005).

Figure 1: Log ratio of male/female hourly wage by percentile and interview

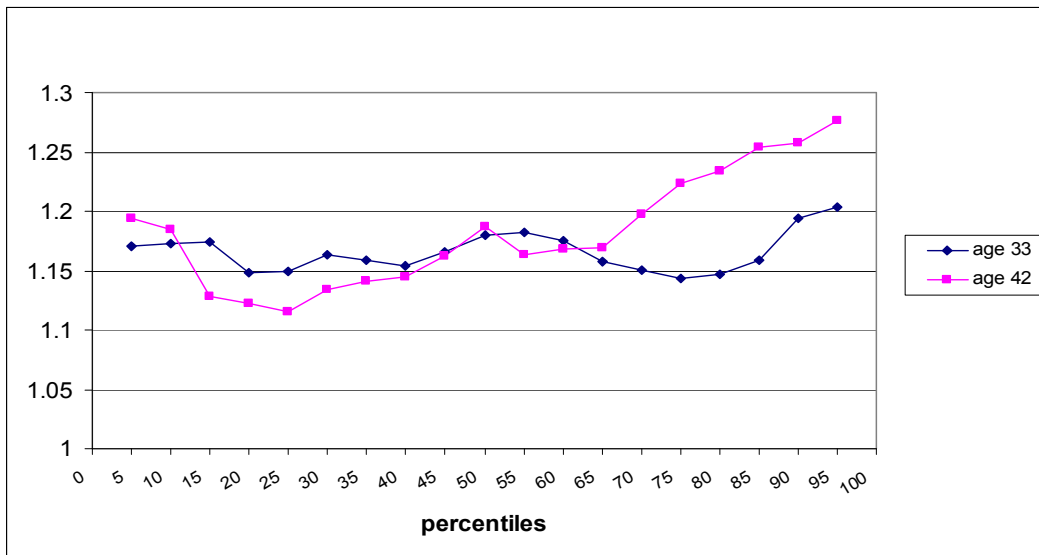
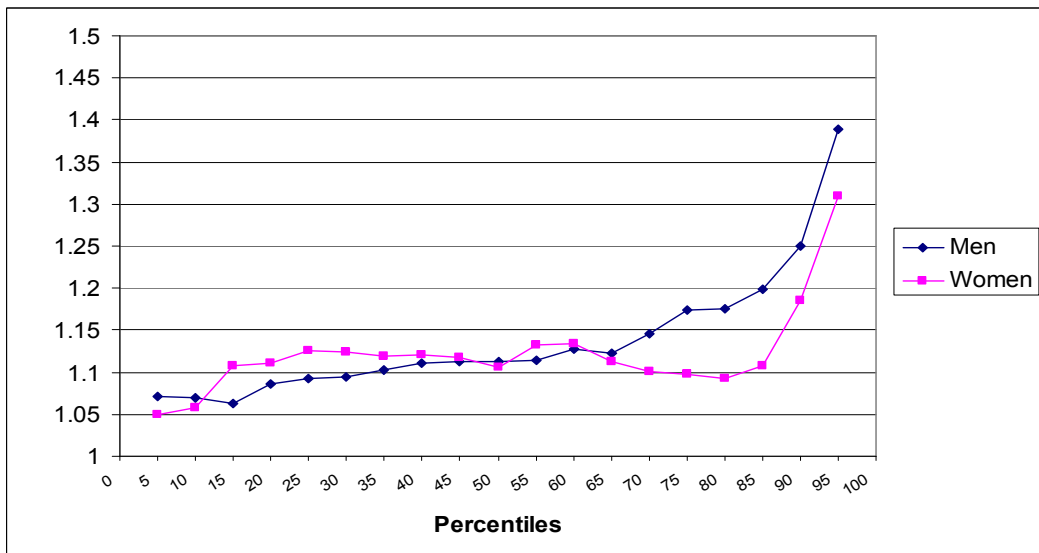


Figure 2: Log ratio of age 42/age 33 hourly wage by percentile and gender



5. Results – wage differences age 33 to 42

The regression results modeling the wage difference for the pooled sample of all men and women are displayed in Table 1. Model 1 (occupation dummies only) shows that men benefited from being over-represented in the two occupation categories with the most wage growth (Managers and Senior officials and Associate Professionals and technical). Apart from this, the male advantage not accounted for by the differential occupational distribution declined to just over 3 per cent higher growth. This unexplained male advantage declined to zero when measures of changes in occupational status are entered as the second block of variables (Model 2) and stayed insignificantly different from zero as the other blocks of variables were added (Models 3 and 4). Nearly all occupations had positive coefficients compared with the reference group, elementary occupations, although only managers had a significant coefficient at 95 per cent level of confidence. Being in a managerial occupation at age 33 was associated with an increase of approximately 9 per cent wage growth over the next 9 years. Professional, associate professional and administrative jobs had significant coefficients at 90 per cent level of confidence and had wage growth of approximately 7 per cent in each case.

The inclusion of occupation changes added to the explanation of wage growth (model 2), and indeed reveals how the wage gains were achieved, or not, but they were at surprisingly similar levels for the men and women in this sample. For example 18.3 per cent of the men versus 18.7 per cent of the women experienced a downward job change, and 27 per cent of each experienced an upward change. Note that the women in this sample are selected on high labour force attachment. Changing occupation between 33 and 42 was significant when it was associated with downward occupational mobility, reducing wage growth by approximately 9 per cent, but not significant when associated with upward occupational mobility. But the promotion element of these job changes was not associated significantly with wage growth, neither was job change without occupational change significant.¹⁰ These results differ somewhat from earlier findings where it was possible to distinguish more accurately between intra or inter-employer moves. Working in a male-dominated occupation, as did 71 per cent of men and only 17 per cent of women, generated an average wage growth of 9 per cent, (12% for those women in these jobs and 6% for men). Working in an integrated occupation by age 42 (23% of men and 34% of women) also brought significantly higher wage growth (8% premium for women) than working in feminized occupations for women. As found in many other studies, occupational

¹⁰ Alternative measures were also tried, but were not significant; namely a single variable for occupation change without any direction of change; a measure of any upward, or downward occupation change using all the employment history spells recoded over the 10 year period.

segregation, and particularly women working in female dominated workplaces, is an important element of women's lower wages in comparison with men. The importance to women's wages of this aspect of their work is reinforced in the separate gender models described below (Table 3).

Models 1 and 2 examine wage growth as a function of occupational position and change. Model 3 examines the role of changes in human capital alongside occupational factors. Experiencing work-related training of 3 or more days (which affected approximately the same proportions of men and women) gave a significant 3 per cent boost to wages, although gaining a new qualification, more likely for the women than men, did not have any effect. Also having had some disruption to employment was associated with a lower wage growth in comparison with uninterrupted employment, approximately 10 per cent lower for one period out of work, and 20 per cent lower for two or more periods out of work. Working part time over the period, contrary to expectation, did not significantly depress wage growth. In this sample, work interruptions were hardly more likely for women than men, but the latter were more likely to have had occasional spells of part-time work.

Lastly (Model 4), family variables were entered, as a mixture of status at age 33 and changes over the period. Men in this sample were more likely to have partners and children, women were more likely to have experienced partnership change. In all cases, none were significantly associated with wage growth in this pooled model of women and men, given that occupational and work history terms are also included.

Table 1: Wage differences for men and women from age 33 to age 42

Wage growth from age 33 to age 42	Men and Women							
	Model One		Model Two		Model Three		Model Four	
	Coefficients	t value	Coefficients	t value	Coefficients	t value	Coefficients	t value
Constant	0.060*	1.620	0.015	0.381	0.022	0.560	0.042	0.996
Male	0.032**	1.965	-0.007	-0.379	-0.007	-0.372	-0.009	-0.497
Occupation at age 33								
Managers and Senior Officials	0.087**	2.356	0.119**	3.102	0.107**	2.794	0.105**	2.705
Professional	0.068*	1.738	0.092**	2.334	0.077*	1.936	0.073*	1.820
Associate Professional and technical	0.074*	1.899	0.100**	2.554	0.084**	2.132	0.080**	2.035
Administrative and secretarial	0.073*	1.843	0.103**	2.589	0.095**	2.402	0.092**	2.319
Skilled Trades	0.009	0.238	0.019	0.502	0.013	0.334	0.011	0.288
Personal service	0.018	0.423	0.035	0.835	0.022	0.536	0.022	0.520
Sales and Customer service	0.044	0.919	0.062	1.304	0.055	1.166	0.053	1.109
Process, plant and machine operatives	-0.014	-0.344	-0.011	-0.271	-0.012	0.307	-0.013	0.338
<i>Reference category = Elementary Occupation</i>								
Change in occupation from age 33 to age 42								
Upward Mobility			-0.005	-0.312	-0.004	0.253	-0.003	0.173
Downward Mobility			-0.078**	-4.202	-0.068**	3.655	-0.067**	3.622
<i>Reference category = No change</i>								
Had any change in job but not occupation level			0.002	0.074	0.024	0.976	0.024	0.965
Male Dominated Occupation			0.097**	4.410	0.089**	4.047	0.089**	4.046
Integrated Occupation			0.048**	2.198	0.044**	2.002	0.045**	2.027
<i>Reference category = Female dominated occupation</i>								
Human capital from age 32 to age 42								
Done any work related training for 3 or more days aged 42					0.028**	2.091	0.028**	2.125
Worked Part Time from age 33 to age 42					-0.026	0.557	-0.026	0.605
Experienced one period of non-working between age 33 and age 42					-0.099**	3.793	-0.100**	3.798
Experienced two periods of non-working between age 33 and age 42					-0.197**	4.209	-0.192**	4.088
<i>Reference category = Continuously worked from age 33 to age 42</i>								
New qualification by age 42					0.020	1.106	0.019	1.095
Demographic circumstances								
Had partner at 33							-0.020	-0.844
Had dependant child at age 33							0.008	0.520
Had no partner at age 33 and had a partner by age 42							-0.026	-0.870
Had a partner at age 33 and no partner at age 42							-0.004	-0.163
Had more children by age 42							0.010	0.660
Had longstanding limiting illness at age 42							-0.026*	-1.704
Sample Size		3558		3558		3558		3558
R Squared		0.008		0.020		0.031		0.032

Note: ** represents p=0.05 * represents p=0.10

Allowing the coefficients to vary by gender in Table 2 did reveal some differences in the coefficients between men and women. It is notable that the two top occupations were associated with significant wage growth for men but not for women. Managers and professionals had higher wage growth by 11 per cent for managers and 10 per cent for professionals. These two occupations, where these men were more likely than these women to be employed, were important to understanding men's higher wage growth over this period. Downward occupational mobility over the period significantly reduced wage growth for men, by 10 per cent, and for women, but by a lower percentage, 7 per cent. Upward occupational mobility and job change without an occupation change were not significant for men or women. Being in a male-dominated occupation, or an integrated occupation gave a significantly larger wage growth to women of 12 per cent for working in male dominated, and 8 per cent in integrated occupations, but no significant advantage to men. This is probably because men who work in female dominated occupations can do very well, often being promoted to a greater degree over the women who work there.

The addition of human capital measures (Model 3) tended to work in the same direction for men and women. Having been out of the labour market once was associated with lower wage growth, 10 per cent for men, and 8 per cent for women. Two or more periods out of work reduced wage growth by 25 per cent for men but only 6 per cent for women, although on the margins of significance. This gender difference is consistent with women choosing occupations that do not penalize women so much for periods out of the labour market. As in the pooled sample, having worked part time did not have any significant effect. This result is not surprising given this sample had relatively few men or women who worked part time over this 9 year period, and the wage data do not contain any part-time wages.

The final addition of variables on family and ill health (Model 4) brought relatively little to the explanation of wage growth. For men, having a limiting long standing illness was associated with approximately 4 per cent significantly lower wage growth, but not for women. It is possible that the often heavier demands of jobs held by men are harder to fulfill alongside having a longstanding illness than the lighter demands and expectations of many jobs held by women. Having a dependent child at age 33 and a full-time job at both 33 and 42 was associated with a significantly higher wage growth for women, by 6 per cent, but was not significant for men. This may reflect the group of women who have had their children early and whose wages are catching up on return to the labour market, or the motivations of select groups who need to work

full time out of serious financial necessity or out of commitment to a career. Having another child between age 33 and 42, having a partner at age 33, or changing one's partner by age 42 were not significantly associated with wage growth for either men or women. Men's wage growth but not women's was significantly lower for those with longstanding limiting illness at 42.

In order to see if the family variables were operating through occupation variables, we reversed the order of entry of the blocks to put the 4th block of variables first. The results were surprisingly unchanged. The set of coefficients on family variables were scarcely more significant than when they had been entered last. Family and partnership made little difference, therefore, to wage growth. It is possible that the loss of a partner between age 33 and 42 does promote wage growth, but that the effect is swamped and accounted for by the other occupation variables. However, overall, these findings point to the selectivity of the sample and late childbearing for explaining the demographic effects, rather than there being a direct beneficial effect of motherhood on pay of a child in the thirties.

Table 2: Wage growth from age 33 to age 42 for men and women separately.

Wage growth from age 33 to age 42	MODEL ONE		MODEL TWO		MODEL THREE		MODEL FOUR	
	MEN	WOMEN	MEN	WOMEN	MEN	WOMEN	MEN	WOMEN
(Constant)	0.086**	0.141	0.042	0.036	0.050	0.018	0.086	0.006
Occupation at age 33								
Managers and Senior Officials	0.107**	-0.046	0.130**	0.049	0.116**	0.049	0.107**	0.065
Professional	0.097**	-0.063	0.121**	-0.005	0.103**	-0.006	0.092**	-0.014
Associate Professional and technical	0.067	0.012	0.087**	0.096	0.068*	0.094	0.059	0.106
Administrative and secretarial	0.042	0.014	0.072*	0.091	0.059	0.098	0.048	0.101
Skilled Trades	0.014	-0.042	0.081	0.026	0.010	0.025	0.005	0.028
Personal service	0.011	-0.033	0.015	0.058	-0.004	0.065	-0.007	0.057
Sales and Customer service	0.014	0.069	0.032	0.124	0.024	0.126	0.017	0.120
Process, plant and machine operatives	-0.002	-0.135	-0.002	-0.092	-0.005	-0.076	-0.008	-0.082
<i>Reference category = Elementary Occupation</i>								
Change in occupation from age 33 to age 42								
Upward Mobility			-0.018	0.026	-0.016	0.026	-0.014	0.032
Downward Mobility			-0.095**	-0.095**	-0.064**	-0.083**	-0.063**	-0.087**
<i>Reference category = No change</i>								
Had any change in job but not occupation level			-0.006	0.020	0.016	0.047	0.015	0.048
Male Dominated Occupation			0.060*	0.119**	0.057	0.115**	0.056	0.112**
Integrated Occupation			0.003	0.079**	0.005	0.075**	0.005	0.069**
<i>Reference category = Female dominated occupation</i>								
Human capital from age 32 to age 42								
Done any work related training for 3 or more days aged 42					0.031*	0.027	0.032**	0.023
Worked Part Time from age 33 to age 42					0.042	-0.074*	0.050	-0.086**
Experienced one period of non-working between age 33 and age 42					-0.106**	-0.078**	-0.103**	-0.079**
Experienced two periods of non-working between age 33 and age 42					-0.255**	-0.058	-0.244**	-0.072
<i>Reference category = Continuously worked from age 33 to age 42</i>								
New qualification by age 42					0.028	0.006	0.026	0.001
Demographic circumstances								
Had partner at 33							0.003	-0.047
Had dependant child at age 33							-0.025	0.064**
Had no partner at age 33 and had a partner by age 42							-0.051	0.030
Had a partner at age 33 and no partner at age 42							-0.040	0.062*
Had more children by age 42							0.003	0.018
Had longstanding limiting illness at age 42							-0.043**	0.012
Sample Size	2608	952	2608	952	2608	952	2608	952
R Squared	0.011	0.018	0.019	0.054	0.032	0.065	0.035	0.077

Note: ** represents p=0.05 * represents p=0.10

6. Results – wage levels at age 42

The results from the model of wages at 42 that controlled for age 33 wages are displayed in Table 3. Broadly speaking these results supported those from our wage growth model. In the sample pooling men and women, the extent of gender wage differences was 11 per cent when occupations only were entered, declining to 5.6 per cent when occupational change and segregation were entered. The gender wage difference stayed at the same level, 5.6 per cent, when human capital differences were entered and then declined marginally to 5.1 per cent through the addition of family and demographic measures.

There were, not surprisingly, a greater number of significant variables in this age 42 wage level model, than the wage growth model that had reduced the amount of variation in the dependent variable through differencing the wages. However, as in the case of wage growth, occupations and occupational change were the main predictors, explaining most of the variation. High level occupations, and working in male or integrated occupations all added to wages at age 42 and downward occupational mobility reduced aged 42 wages.

When coefficients were examined separately for men and women some differences were apparent. Men gained significant wage benefits from being in manager, professional, associated professional and, in some models, administrative jobs, but women's coefficients were not significant, after controlling for age 33 wages. Women did gain significant wage growth, higher than that for men, by being employed in male dominated occupations and in integrated occupations. Women also suffered less wage penalty than men from periods out of the labour market. This is consistent with claims that women are offered additional flexibility in their working arrangements these days, when men are not, due to the expectation, especially in male-dominated workplaces, that men do not need access to flexible working or leave (Dex, 2003).

Human capital measures acted in the traditional way except varying slightly by gender; additional qualifications were associated with increased wages, and time out of the labour market with lower wages. Having had a part-time spell was not significant in the total sample, but had a negative and significant depressing effect on women's wages while additional training was a significant positive influence on men's wages but not significant for women's wages.

Inclusion of the block of family variables made little difference to the level of wages at 42 conditioning on wages at 33. Neither did reversing the order of entry of variables, making family variables first, alter the amount of variation explained by this set of family variables. It is not the case, therefore, that domestic circumstances have an effect which works through occupation, occupational mobility or segregation. Neither do the measures for employment interruption hide an effect of family responsibilities in this sample.

Table 3: Wage level at 42

Log wage at 42	MEN AND WOMEN							
	Model One		Model Two		Model Three		Model Four	
	Coefficients	t value	Coefficients	t value	Coefficients	t value	Coefficients	t value
(Constant)	0.633**	14.049	0.614**	13.523	0.637**	14.103	0.654**	13.701
LOG WAGES AT AGE 33	0.654**	38.163	0.612**	35.483	0.598**	34.743	0.594**	34.332
Respondent is male	0.108**	6.825	0.055**	3.142	0.057**	3.240	0.050**	2.801
Occupation at age 33								
Managers and Senior Officials	0.271**	7.508	0.367**	9.774	0.353**	9.454	0.345**	9.205
Professional	0.282**	7.359	0.363**	9.321	0.349**	9.023	0.341**	8.773
Associate Professional and technical	0.261**	6.880	0.333**	8.785	0.313**	8.278	0.307**	8.096
Administrative and secretarial	0.166**	4.410	0.232**	6.181	0.224**	6.014	0.220**	5.890
Skilled Trades	0.076**	2.124	0.114**	3.193	0.105**	2.954	0.101**	2.842
Personal service	0.117**	2.957	0.165**	4.202	0.145**	3.721	0.143**	3.663
Sales and Customer service	0.143**	3.150	0.180**	4.007	0.170**	3.821	0.164**	3.678
Process, plant and machine operatives	0.024	0.650	0.039	1.046	0.037	1.016	0.035	0.954
<i>Reference category - Elementary occupation</i>								
Change in occupation from age 33 to age 42								
Upward Mobility			0.031*	1.941	0.030*	1.863	0.030*	1.864
Downward Mobility			-0.125**	7.187	-0.116**	6.676	-0.115**	6.588
Reference category - No change								
Had any change in job but not occupation level			0.009	0.397	0.036	1.524	0.033	1.412
Male Dominated Occupation			0.148**	7.123	0.140**	6.776	0.138**	6.682
Integrated Occupation			0.067**	3.270	0.063**	3.087	0.063**	3.055
<i>Reference category - Female dominated occupation</i>								
Human Capital from age 33 to age 42								
Done any work related training for 3 or more days aged 42					0.061**	4.896	0.063**	4.990
Worked Part Time from age 33 to age 42					-0.049	1.217	-0.054	1.341
Experienced one period of non-working between age 33 and age 42					-0.109**	4.463	-0.108**	4.438
Experienced two periods of non-working between age 33 and age 42					-0.203**	4.671	-0.196**	4.489
<i>Reference category - Continuously worked from age 33 to age 42</i>								
New qualification by age 42					0.030*	1.793	0.029*	1.738
Demographic circumstances								
Had partner at 33							0.016	0.722
Had dependant child at age 33							0.002	0.125
Had no partner at age 33 and had a partner by age 42							0.013	0.471
Had a partner at age 33 and no partner at age 42							-0.015	0.630
Had more children by age 42							0.026*	1.763
Had longstanding limiting illness at age 42							-0.034**	2.419
Sample Size		3558		3558		3558		3558
Adjusted R Square		0.42		0.46		0.47		0.47

Note: ** represents p=0.05 * represents p=0.10

7. Conclusions

In this paper we have examined wage change between age 33 and 42 of the group of men and women selected because they were the closest comparators in their labour market experience. At the starting point, age 33, these women and men differed in their wages, with men having the advantage, despite the fact that these women were more highly educated than the men. Raw wage growth also differed by gender with men's wages growing more than women's especially at the top of the distribution. Our analyses of the differences in wage growth and wage levels achieved by age 42 point to the main reasons being related to the occupations held by these men and women. Men's wages grew most in the top occupations, where they were relatively more numerous and where those women who were employed received only average wage growth. Women's wages tended to grow more slowly over the period than men's wages because they were located disproportionately in feminised jobs which experienced slower wage growth. Downward occupational mobility, was associated with lower wage growth, but affected an equal proportion of men and women to an equal extent. Upwardly occupational mobility also affected a similar proportion of men and women in this sample, but was not associated with any faster wage growth than the immobile, and hence could not explain men's faster wage growth. We found no evidence that the women's pay in this group was lagging behind men's because of domestic responsibilities. Domestic considerations undoubtedly play a part in determining the pay of women more peripheral to the labour market than this group of continuous full-time workers. However, within the sector of the labour market we have examined here, factors within the workplace, rather than the home, are generating the gender bias to wages as people move through the middle of life course.

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Appendix Table A1: Means and standard deviations of variables

Descriptives of variables included in model	MEN		WOMEN	
	Mean	SD	Mean	SD
Difference in LOG WAGES BETWEEN 42 AND 33	0.135	0.415	0.123	0.327
Managers and Senior Officials	0.218	0.413	0.168	0.374
Professional	0.113	0.317	0.150	0.357
Associate Professional and technical	0.107	0.310	0.186	0.389
Administrative and secretarial	0.066	0.248	0.298	0.458
Skilled Trades	0.214	0.410	0.020	0.140
Personal service	0.076	0.265	0.081	0.273
Sales and Customer service	0.039	0.193	0.039	0.193
Process, plant and machine operatives	0.118	0.323	0.048	0.215
Elementary	0.048	0.215	0.010	0.097
Upward Mobility *				
Downward Mobility *				
No change in mobility status	0.552	0.497	0.544	0.498
Had any change in job but not occupation level	0.075	0.264	0.079	0.270
Male Dominated Occupation	0.708	0.455	0.166	0.372
Integrated Occupation	0.227	0.419	0.336	0.473
Female dominated occupation	0.065	0.246	0.498	0.500
Done any work related training for 3 or more days aged 42	0.474	0.499	0.455	0.498
Worked Part Time from age 33 to age 42	0.011	0.105	0.064	0.245
Experienced one period of non-working between age 33 and age 42	0.066	0.248	0.084	0.278
Experienced two periods of non-working between age 33 and age 42	0.021	0.144	0.020	0.140
Worked continuously from age 33 to age 42	0.913	0.282	0.896	0.306
New qualification by age 42	0.149	0.356	0.231	0.422
Had partner at 33	0.832	0.374	0.676	0.468
Had dependant child at age 33	0.639	0.480	0.435	0.496
Had no partner at age 33 and had a partner by age 42	0.080	0.271	0.110	0.313
Had a partner at age 33 and no partner at age 42	0.066	0.248	0.096	0.294
Had more children by age 42	0.304	0.460	0.165	0.377
Had longstanding limiting illness at age 42	0.238	0.426	0.267	0.443
Log wage at 33	2.223	0.414	2.061	0.394
Log wage at 42	2.357	0.510	2.184	0.436
Sample Size	2606		952	

*The occupational ranking for upward or downward moves from age 33 to age 42 was derived from 9 SOC major 1990 occupations ranked according to occupational mean wages: at the top end was professionals followed by manager; associate professional; administrative-clerical; skilled trades; process and plant operatives; personal and protective; sales; other elementary. An upward move was set to 1 if any occupation at age 42 was a higher level occupation then their occupation at age 33 and a downward move scored 1 if their occupation at age 42 was a lower level occupation compared to their occupation at age 33.