Higher education expansion in the UK: the impact on graduate earnings and gender inequalities

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The changing conceptualisation of Higher Education

The policies of successive UK governments, in common with those of virtually all developed and most developing countries, increasingly have been designed to expand in higher education in the belief that widening access and the resulting increased output of graduates will contribute to the growth of a 'high skills' economy and greater economic and social prosperity. In the early 1960s less than 8 per cent of UK school-leavers entered higher education (HE) and full-time 'mature students' were virtually unknown. Throughout the 70s, the social accountability of universities was increasingly stressed and moved from the periphery to the centre of UK government thinking about HE investment in the 1980s. Initially, government demands for greater efficiency curtailed growth at the start of the decade but increasingly, these led to changes that lowered the unit cost of provision without reduction of numbers and to considerable expansion in the late 1980s and into the 1990s. At the beginning of the 1990s, the binary divide between public (local government funded polytechnics) and the independent (UGC-funded universities) tertiary education was removed, allowing polytechnics to be called universities and award their own degrees rather than through accreditation as London University external degrees or by the Council for National Academic Awards (CNAA). The concurrent and subsequent expansion has accelerated the growth of mass higher education, and it has moved considerably from the *elite* provision and philosophy of the 1960s' system. Along with lower unit costs, current provision is characterised by increasing diversity of HE providers, courses and participants and by the impact of successive government policies on HE management, funding and participation.

The pursuit of more reliable outcomes data is the latest development in the policy and provision trends discussed above, throughout which HEIs' *market* relationships with their stakeholders have been conceptualised by all the parties concerned as progressively more central and more subject to cost-benefit analysis. In line with the ethos of new public sector management more widely, students became customers and investors, employers became clients (Ferlie *et al,* 1996), and this increasingly 'outside in' policy approach to UK higher education (Shattock, 2006) is predicated upon the availability of accurate labour market information. In his introduction to a collection of research-based discussions of the relationship between HE and the labour market Lindley (1981) reflected that 'the placing of labour market questions first on the agenda does not reflect the view that the answers to them should, necessarily, determine policy over the next two decades,' but many would argue that in effect, this is what had already begun to happen and has become the main driver of policy since then.

The 'knowledge economy' thesis that underpins these policies, as well as the policies themselves, predicated upon the belief that in the 21st century, successful economies will rely more upon knowledge rather than material resources to maintain competitiveness in the 'knowledge-intensive' global economy (EU 2004, Rodrigues (2004), OECD 2004, DfEE 1998, Leadbeater 1998, Reich 1992), has been critically reviewed by the research community (*e.g.* Brown *et al.* 2008). Social scientists have largely been sceptical about both trends and policy diagnoses, arguing that movement towards a knowledge-intensive economy has been overstated, that the predominant policy emphasis on the supply-side of the labour market is misguided, that apparent up-skilling reflects, at least in part, credential inflation, and there has been concern that there is a growing over-supply of graduates to the labour market, a mismatch between the skills and knowledge developed on degree programmes and employers' requirements, resulting in underemployment or under-utilisation of skills among a substantial minority of graduates (Brown and Hesketh 2004, *e.g.* Deer 2004; Lloyd and Payne 2003). Deer and Mayhew (2007) raised questions about the longer term implications of UK and EU high skills policies and the socio-economic impacts of HE expansion, but there is no doubt that, although the graduate premium has decreased somewhat since the millennium, employers have continued to pay for (and invest in) applicants with degrees (Green and Zhu 2008, Elias and Purcell 2004, Felstead *et al.* 2003) and this trend, taking account of projected changes that will inhibit growth, even on the most pessimistic estimates, is expected to continue for the next 20 years ((Bekhradnia and Bailey 2008), beyond current recessionary slowdowns – recognising that there is an increasingly wide range and possibly an element of polarisation in the returns to different degree achievements and areas of knowledge.

Given the expansion and increasing diversity of the graduate labour supply, it is not surprising that the graduate premium gained by recent cohorts is lower than that of their predecessors (Green and Zhu 2008, Dolton and Vignoles 2000) or that financial returns to HE vary by subject studied (Walker and Zhu 2003), which has always been the case. Reported under-use of the skills developed by graduates in HE is not a new phenomenon either

Dolton and Vignoles (*ibid.*) estimated on the basis of survey evidence that 38% of 1980 graduates were 'overeducated' for their first job and, even six years later in 1986, 30% reported evidence suggesting that this remained the case[1]. Until recently, however, research has continued to indicate that obtaining a degree increases the propensity of and individuals to obtain better jobs and higher earnings than otherwise comparable workers without degrees, both in the short and long term (Elias and Purcell, 2004; Brennan *et al*, 2001; Elias *et al* 1999a; Dearden *et al*, 2000), and this is not confined to the UK graduate labour market (Brown unpublished, Brown *et al*. 2008, Luintel and Khan 2005, Teichler, 2000). Until recently, the evidence from the recent UK surveys of graduates indicates that although some take longer than others to find jobs commensurate with their education - notably those with non-vocational degrees where numeracy skills have not been developed - which was also reported of the pre-expansion cohorts (Lyon 1992, Tarsh 1990, Brennan and McGeevor 1988) – the subjective evaluations of graduates themselves has remained predominantly positive (which undoubtedly reflects different expectations among the increasingly diverse graduate population).

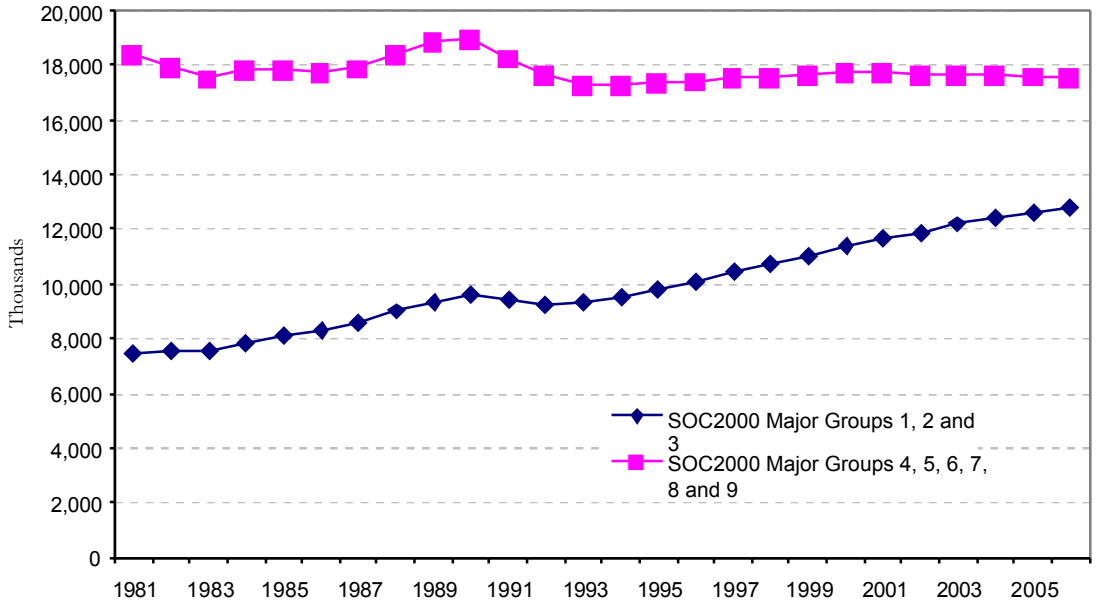
This debate continues, primarily because the UK Higher Education system has undergone a major transformation over the past 25 years, from a system that catered for an *elite* group of entrants in the late 1960s and early 1970s to one that now aims to provide tertiary education to half the population of 18 - 30 year olds and provide 'second chance' opportunities for adults. The gender balance of HE participants and graduates has also changed. Women were 42 per cent of the 414,000 full-time undergraduates studying at UK HEIs in 1970/71, 54 per cent of their 1.1 million successors registered in 2000/01 and 55 per cent of those who began full-time undergraduate study in autumn 2006. It is the scale of this expansion that has led to speculation that two consequences would become apparent: first, that the rate of return to higher education would fall sharply among recently-qualified graduates; and second, that the increased participation of women would further contribute to and exacerbate a mismatch between the supply of and demand for graduate skills and knowledge. In this paper, we explore further the interdependent relationships between the components of labour market change: increase in the graduate labour supply, sectoral and occupational restructuring, women's labour market participation and gendered patterns of employment.

Trends in UK employment

Over the past two decades, employment in the UK has grown by approximately 4 million, approximately 20 per cent of the entire workforce. Most of this growth has been located at the higher end of the occupational spectrum. An indication of the nature of these changes can be gained from Figure 1, in which we distinguish between two broad categories of occupations. The first of these covers managerial, professional and associate professional occupations, essentially those which are strongly connected with the growth of the 'knowledge economy' – jobs linked to the production and utilisation of knowledge rather than physical goods and low level services. From a base of approximately 8 million jobs in the late 1980s, this group of occupations now covers over 12 million jobs. While there have been offsetting compositional changes among the other group of occupations (covering administrative, secretarial, skilled trades, personal, sales and customer service, process, plant and machine operatives, elementary occupations), it is clear that the growth in the group of high level occupations is linked to the growth in full-time employment more generally.

[1] It has to be said that economists base such statements on very limited evidence that takes little account of the subjective perceptions, career choices and the different options available to those with degrees in different disciplines and different performance and potential. Even where there clearly are differences, we prefer the concept of 'underemployed' to 'lacking particular skills' rather than 'over educated'.

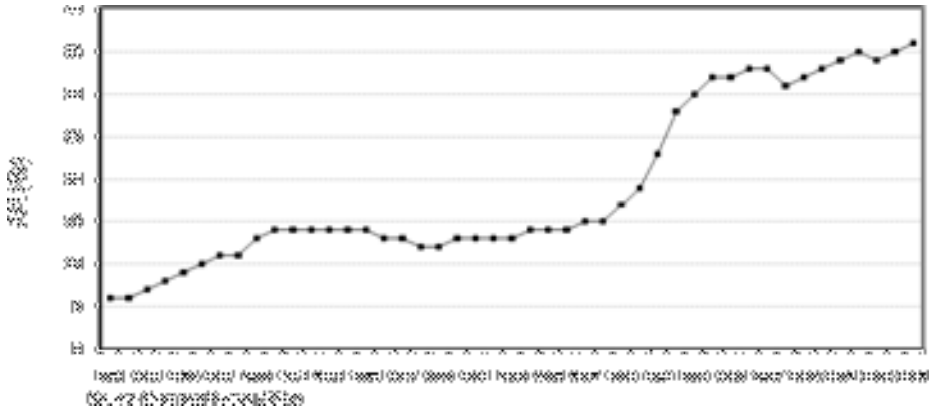
Figure 1: Changing structure of occupations, UK, 1981-2006



Source: Unpublished estimates of employment: Warwick Institute for Employment Research / Cambridge Econometrics, 2005

Such growth would not have been possible without some increase in the acquisition of high-level qualifications associated with many of the jobs in this group of occupations. Figure 2 shows the growth in participation in higher education for young people through the early 1990s, the period of transition within the higher education sector from a system catering for a relatively small elite to mass higher education.

Figure 2: Participation by young people in Higher Education, Age Participation Index[2] (API) Great Britain, 1961 to 2005



Much of this growth reflects women's increased participation in higher education – to the extent that the preoccupation with girls' and young women's educational underachievement has now been superseded by concern about lower proportions of young males obtaining secondary education qualifications and proceeding into higher education and training. Girls are less likely to complete school with no formal qualifications and obtain more and better national secondary education certificate grades than boys: women graduates are more

2 The Age Participation Index (API) measures the number of home domiciled young (aged under 21) initial entrants to full-time and sandwich undergraduate courses, expressed as a proportion of the average 18 to 19 year old Great Britain population.

likely to have obtained first class or upper second class honours degrees than males, and consequently are well-placed to compete for 'knowledge economy' jobs, where the growth of female employment has exceeded that of males.

Graduates now work in a much wider range of occupations than was the case 25 years earlier and a high proportion of these occupations involve the production, management or transfer of knowledge or information. To a large extent, this is because the nature of work has changed in ways that have both stimulated and accommodated the substantial expansion in higher education. In some areas of work this reflects the growth of sectors and occupations that make use of graduates (*e.g.* the information and communication technology sector, environmental and social welfare occupations). In other areas it relates to the perceived need within organisations to recruit those who have relevant high-level qualifications into occupations where no such pool of highly qualified labour previously existed (*e.g.* the wide range of junior and middle management and administrative jobs for which graduates are now recruited). In part it stems from the growth of particular occupational specialisms (*e.g.* in many areas of health care, education, construction, engineering, technical sales). A pathway through higher education is becoming the *de facto* standard for entry into these occupations, with women participating to a greater extent than men at this educational level. Amidst the debates about 'over-education', underemployment and 'the market for talent', it seems to us that related changes in what used to be called 'the sexual division of labour' and their implications are often overlooked.

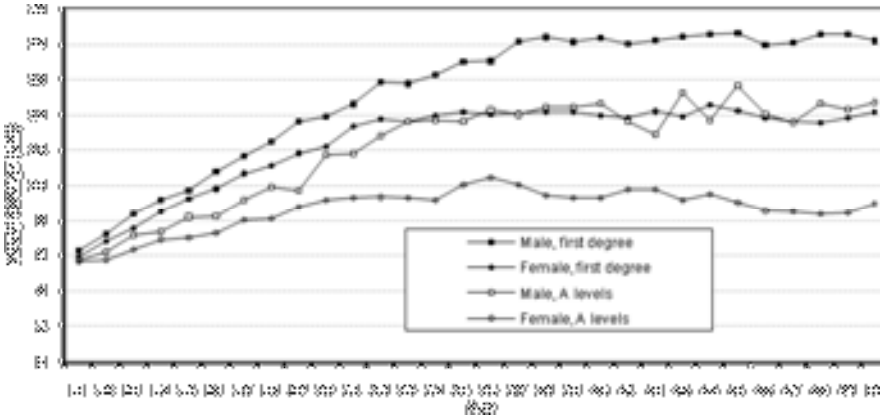
But how substantially do they affect gender inequalities? We consider gender differences and similarities in career development. In so far as equal opportunities and equal pay legislation have succeeded in eliminating discrimination on the basis of gender and promoted culture change leading to equality of aspirations among women and men and their equal treatment by employers, it might be expected that we would find female graduates near to the start of their careers having been employed continuously in full-time employment to the same extent as their male peers, to be particularly well-equipped to take advantage of the changes. We might expect to see the balance of gender dependency shifting, with consequent cultural changes in relation to family-building.

The expansion of higher education and the earnings of graduates

We begin by considering the consequences of educational expansion in terms of its impact on the earnings of graduates and non graduates, to establish the longer term impacts of educational expansion on the distribution of earnings among these two groups. Has the increased supply of highly qualified people caused employers to make greater use of possession of a degree as a 'gateway' to better paid jobs, effectively reducing the earnings of those without such a qualification, or has the labour market responded to the increased supply of graduates by absorbing them into lower paid jobs? Has the demand for highly qualified labour changed in recent years and, if so, what evidence do we have that this has impacted upon the earnings of graduates and non graduates?

Exploration of changes in the earnings of graduates is complex. Compositional effects are likely to be quite significant. It is well established by the studies already cited and others, that the earnings of graduates are strongly associated with a wide variety of factors Purcell and Elias 2008, Walker and Zhu 2003, Blundell *et al* 2000, 1997). Furthermore, demographic changes have reduced the numbers of young people in the population. We are also aware that the graduate earnings premium is significantly related to the number of years that the graduate has been in the labour market since gaining a degree. Figure 3 shows how the earnings of graduates increased more rapidly than those on non-graduates in the first ten years after graduation – the period in which the graduate earnings premium is established.

Figure 3: Average hourly earnings of graduates (first degree only) and non-graduates (A-levels only), by age and gender



Source: Labour Force Surveys, 1999 - 2003.

While graduates at any age earn significantly more than non-graduates, the emergence of the gender pay gap arises in a similar fashion for graduates and for non-graduates, and the first ten years after graduation are critical. A gender difference is apparent even for the youngest graduates, initially at about 10 per cent, but rising to about 25 per cent by the time graduates reach their mid 40s. This widening of the pay gap with age does not necessarily indicate the existence of a lifecycle phenomenon. These data are cross-sectional – that is, they arise from respondents across the range of ages shown and over a specific time period (Labour Force Survey earnings information collected between 1999 and 2003), but they may reflect changing patterns of family-building (which, of course, are likely to reflect changing levels of educational and occupational achievement). They give a picture of the average situation prevailing in this period for all age groups, but no indication of the earning path through which these average values arose.

To unravel these various influences, we propose to focus on the particular life cycle stage during which career development, access to (or exclusion from) opportunities, and trajectories of earning growth are established: the 29-33 year old 'early careers' age group, when young adults might be expected to have moved beyond first destinations, 'false starts', graduate and occupational study and the voluntary or involuntary postponement of entry to employment related to their skills and knowledge. First, we examine evidence of change in the distribution of graduate earnings over time, to assess the impact of the increased graduate labour supply, comparing members of these age cohorts in the early1990s and 2005-6. Next, we use a classification of occupations that we have developed to explore trends in the relationship between higher education and labour market change to move beyond the general to a more nuanced understanding of the relationship between qualifications, employment, gender and earnings (SOCHE). We then progress to an analysis based on longitudinal information – observations from the same individuals collected at different points in time – using data provided by 1995 graduates surveyed in 1998/9 and again in 2002/03. Finally, we focus the microscope on particular occupations and individual career dynamics and outcomes that throw light on why gendered career patterns persist among young, highly-qualified adults.

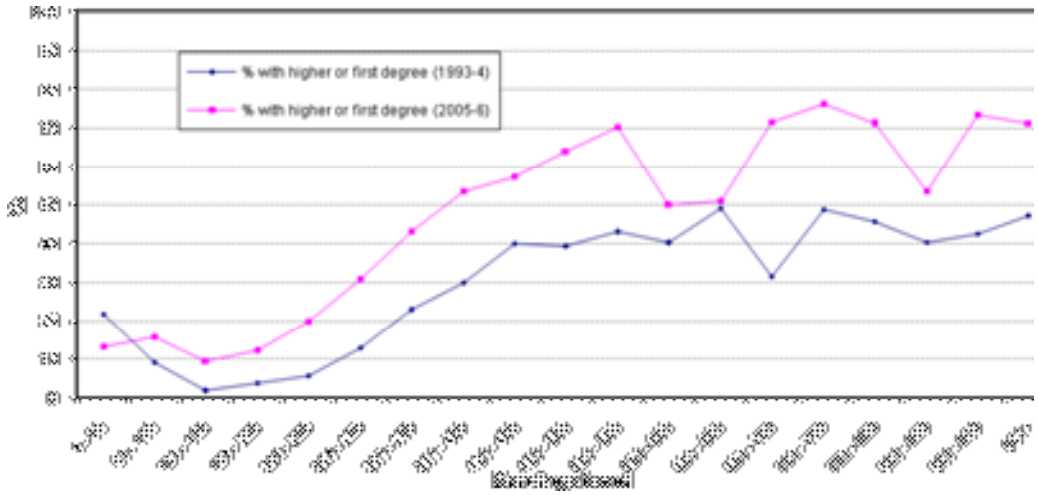
The changing distribution of graduate earnings

We examine the earnings of two groups of 29-33 year olds; the first observed in 1993-4 and the second 12 years later, in 2005-6. The choice of the age grouping reflects the need to control for the length of time that these graduates have been in the labour market – approximately 10 years on average for each cohort. For each, the earnings of those in full-time employment are extracted from those recorded in the UK Labour Force Surveys, distinguishing between those with a first or higher degree and those with lesser qualifications. The majority of graduates in the 1993-4 group obtained their first degrees between 1981 and 1985, and those in the 2005-6 group graduated between 1993 and 1997. Between these years UK graduate numbers expanded rapidly

Average differences in the relative earnings of graduates and non-graduates might have been expected to rise or at least remain relatively constant if, as more people acquire higher education qualifications, employers had progressively adjusted by segmenting the labour market into graduate jobs and non-graduate jobs, restricting the recruitment of graduates to jobs that utilise and reward their potential to innovate and 'add value' as a result

of the skills and knowledge they possess – and paying a premium for these skills. Conversely, it might have been expected to fall if the 'over education' hypothesis (that graduates had been increasingly recruited into lower paid jobs not requiring higher-level skills and knowledge, previously were the domain of non-graduates, reflecting an oversupply of highly qualified labour) holds. The actual change that was recorded between 1993-4 and 2005-6 is shown in Figure 4. Despite the fact that there is a degree of 'noise' in these graphs associated with the lower survey numbers at the higher end of the earnings distribution, the analysis reveals that the change observed lends more support to the first hypothesis, that the graduate earnings premium was maintained this period of rapid expansion of the number of graduates in the labour market. Whether this will continue in the current global recessionary situation remains to be seen. There is some indication that graduate underemployment has recently been rising, but graduate unemployment remains considerably lower than for less-qualified groups.

Figure 6: Actual change in the distribution of young graduates by earnings, 2005-6 compared with 1993-4



Note: Earnings in 2005-6 have been deflated by 58.3 per cent – the growth in earnings of all employees between 1993-4 and 2005-6

Longitudinal analysis of gender differences in earnings

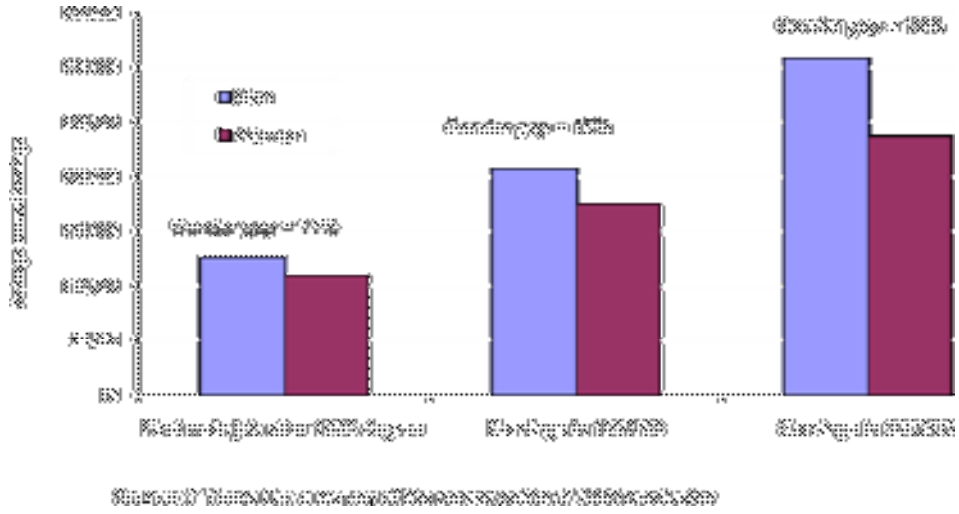
For further examination of the evolution of the gender difference in UK graduate earnings, we use data from a longitudinal study we began in 1997/98: a national sample of graduates who gained their first degrees in 1995. A second sweep was conducted in 2002/03 and in 2005 we returned to the sample for a subsequent project specifically to explore gender differences in early-career trajectories and outcomes. As part of this, further detailed interviews were conducted ten years after graduation with a sub-sample of graduates who had been identified as career-orientated in 2002/3.

Figure 5 shows the evolution of the gender gap in pay among 1995 graduates in full-time employment[3] : for their first main job after graduating in 1995 (as long as the job was started before January 1996), at the time of the first survey of this cohort (1998/99) and at the time of the second survey (2002/03)[4].

3 For this and all subsequent analyses, our data are restricted to those who stated that they were in full-time employment in 2002/03 and who were aged less than 30 years at the time they graduated in 1995. The exclusion of those aged over 30 years at the time of graduation was undertaken because of the lack of information in the survey about work experience prior to graduation.

4 Sample attrition is a major problem with longitudinal surveys and our survey is no exception. Response rates in 1998/99 were just over 30 per cent. Only 70 per cent of these respondents gave permission to be re-contacted. Of these, only 50 per cent responded. However, we are able to determine whether or not the respondents at the second survey are systematically different from those who responded at the first survey. We find little evidence of such systematic differences.

Figure 5: Average annual gross earnings of 1995 graduates by gender



Averages, however, disguise the complexity of the interaction of variables that contribute to differences and inequalities. Appendix Table A1 presents results from a detailed multivariate analysis of the earnings of 1995 graduates, including only those in full-time employment, seven years after graduating with their first degree. These reveal that the unadjusted earnings gap (without taking account of gender differences in subject studied, social class background, entry level qualifications, class of degree obtained, *etc*.) has been increasing steadily as careers evolve over the seven and a half year period since graduation. Women graduates reported full-time annual gross earnings in their first job after graduation that were, on average, 11 per cent less than those of male graduates. Three and a half years later this had risen to 15 per cent, then to 19 per cent by 2002/03. The analysis reveals that, although a number of factors show a powerful association with annual earnings, they do not necessarily contribute to a better understanding of the gender difference in pay [5]. Gender differences in earnings do, however, appear to be associated with a number of factors which vary significantly between men and women. The most important among these are:

- gender differences in weekly hours worked;
- the sectoral distribution of graduate jobs and public/private sector location;
- the extent to which graduates are employed in workplaces where the type of job they do is gender-segmented;
- gender differences in subject studied for their 1995 degree.

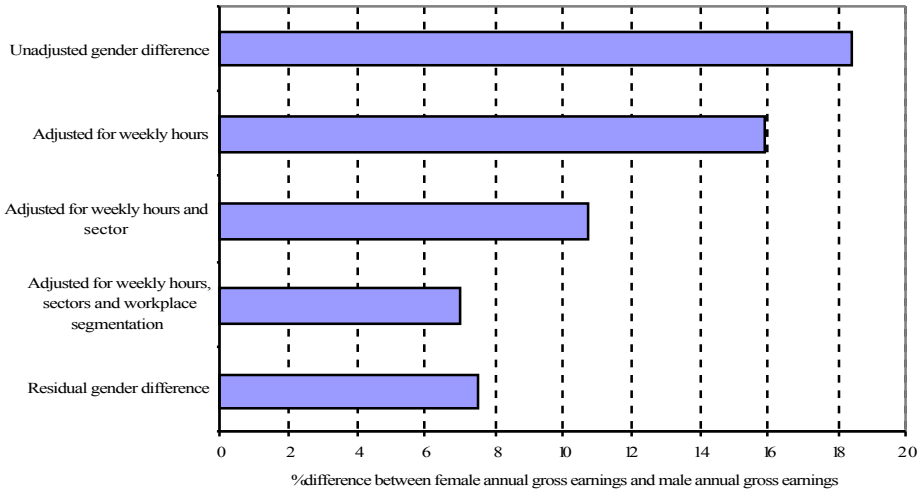
The combined effects on the gender difference in pay

The combined influence on the gender difference in pay of the factors outlined above is graphically shown in Figure 6. The uppermost bar on this chart shows the unadjusted difference in the earnings of male and female graduates in full-time employment seven years after graduation, as was shown in Figure 5. Each bar beneath this shows the effect on the gender difference in pay of introducing statistical controls for various factors. The adjustment for weekly hours alone reduces the gender differential to about 16 per cent from over 18 per cent. Next, adjustments are added for the sector of employment (SIC Divisions and the public/private sector distinction). This has a major impact on the gender difference in pay. Introduction of these statistical controls, together with the adjustment for hours, reduces the gender difference further to nearly 11 per cent. Finally, the impact of gender segmentation at the workplace as a major force in the gender difference in earnings is revealed by noting that statistical adjustment for this factor brings the gender difference down a further 4 percentage points. The final bar in this chart is the gender difference remaining after all the variables shown in the regression estimates in Appendix Table A1 have been added. This is slightly higher than the gender difference

5 For example, graduates working in inner London gained a 25 per cent premium on their earnings, reflecting the higher wages paid by inner London employers to take account of higher living costs, so if male graduates had a greater propensity to obtain inner London employment, this could be a factor in the gender pay gap. However, there is little gender difference in regional dispersion, so location of employment and the pay differential associated with it is not, therefore, a factor underlying the gender difference in graduate earnings.

adjusted simply for hours, sectors and workplace segmentation, reflecting women's higher average entrance qualifications for university and their better degree results.

Figure 6: The combined effects of various factors on the gender difference in annual earnings of 1995 graduates seven years after graduation



Source: 7 *Years On: a survey of the career paths of 1995 graduates*

An interesting finding from the analysis relates to the relative effects of subject studied and sector of employment. While these two factors are clearly related, we anticipated that subject studied would appear as the most important factor in helping us to understand the gender difference in pay. In fact, it turns out that the opposite is true – sector of employment and the public/private sector distinction are better predictors of the gender difference in earnings than subject of study, although the two are clearly inter-related when we look at the occupational distribution.

Differences in weekly hours worked and the different sectors in which men and women graduates are employed alone 'account for' half of the gender difference in the earnings of young 1995 graduates in full-time employment seven years after gaining a first degree. Clearly this does not 'explain' the gender difference, given that choices of working hours, working in the public or private sector are choices made in the light of subjects studied, domestic constraints, partnership and may well reflect gender-based constraints on opportunities to vary working hours or access particular employment options. However, a very interesting result illustrated at the 'macro' level of this national study is that the gender difference in earnings relates also to the gendered nature of the work environment. Women graduates tended to work in jobs where people who did their kinds of job tend to be primarily other women, and these jobs paid less than jobs in male dominated workplaces, a finding that reinforces earlier sociological studies of gender segmentation at the workplace and its association with gender inequalities in pay and promotion profiles (Wilson 1998, Cockburn 1991, Kanter 1977).

Our interview data provide further illustration of the impact of gendered occupational contexts on career development. In previous publications where we have discussed the interview data in detail (e.g. Purcell and Elias 2008 *op cit.* Purcell *et al.* 2006, *op cit*, Purcell and Elias 2005), we have cited the following examples:

- a female Natural Sciences graduate who had moved from the food manufacturing industry to a post working for a government agency as a Civil Servant because she felt that her professional skills and organisational contributions had been undervalued and under-rewarded in comparison to colleagues – and she attributed this to being seen as 'one of the women' (all of whom were less highly-qualified than her) rather than 'one of the senior staff' (all of whom, apart from her, were male);
- several Engineering graduates who reported being excluded from 'the big projects', to which engineers tended to be allocated informally in the overlapping work/social contexts such as the pub and the golf course;
- an Engineering graduate given projects where she was 'set up to fail' by being given an unreasonable workload: an issue which led to a successful sex discrimination claim;

- *all* the engineering graduates interviewed, when asked neutrally about 'any obstacles encountered in your career, Problems in career development or getting jobs you felt were suitable for you?' reported difficulties about being 'a woman in a man's world' [6].
- a Business Studies graduate with the job title of Marketing and Human Resources Manager who was expected to take the minutes of management meetings and make tea for her colleagues.

Further exploration of why we find highly-qualified women and men working in contexts where 'people who do their jobs' are the same sex, revealed that those with androgynous occupational skills are more likely to be recruited to 'gender appropriate' vacancies: males and females both become human resource managers, but relatively well-paid human resource management posts in manufacturing industry are more likely to be filled by men, and somewhat less highly-paid public sector HRM posts by women even among young graduates(Purcell *et. al*, 2006 *op cit.*).

Unravelling macroeconomic change

This analysis leads us back to the aggregate labour market data that we began to explore earlier, with the imperative to recognise and further explore the diversity within both the graduate labour supply and 'the graduate labour market' within which they complete for employment. In order to improve understanding of the changing graduate labour market, we developed a research-based occupational classification to map and monitor change in the graduate labour market (Elias and Purcell, 2005). It identifies four distinct labour market evolutionary categories where recent graduates were employed in jobs where they reported using their skills and knowledge, according to their responses in the relevant surveys and when interviewed in detail about their day-to-day work, and also enables us to monitor change in graduate participation in unequivocally non-graduate jobs.

The more established areas of graduate employment: *traditional* and *modern* graduate jobs - the 'old professions' and occupational areas that had emerged or increasingly recruited graduates since the post-Robbins HE expansion - were most likely to call for discipline-based expertise that unequivocally required the education they had completed as well, often, as strategic and interactive skills, as did many of the *niche* graduate jobs found in generally non-graduate vocational areas with an established minority graduate-entry route, such as nursing and hotel management. In comparison, the more recent areas of graduate employment that we labelled *new* graduate jobs - where the proportion of incumbents to have degrees rose substantially in the latter part of the 20th century - they were more likely to be jobs with somewhat lower discipline-based expertise requirements, but substantial strategic, managerial or interactive skills. One of the striking things about *new* and *niche* graduate jobs, and to a lesser extent, also *modern* and *traditional* graduate jobs - especially as revealed in the 1995 cohort interviews seven years after graduation, as careers progressed - was the extent to which hybrid skills were required: expertise *allied to* high level strategic or interactive skills and the ability and knowledge to access and process information.

In Table 1 we will compare 'graduate career-building' age groups (i.e. those aged between 21-35 years old, who might be expected to be both economically active and be in a cohort where possession of a degree is theoretically a possibility in these aggregate groups and look particularly at those who were incumbents of selected occupations in 1993/94 and 2004/06 for whom comparable category data are available, taking account of occupational classification changes and reclassifications over the periods in question. We have selected occupations where the changes in the occupational classifications used for Labour Force Data have had little impact and they remain comparable (although of course the inherent structure and content of occupations, with implications for the skills and knowledge required to do them or do them well, is in some cases likely to have been affected by technological change and other innovations. We also include, where appropriate, occupations that have exhibited growth, stability and decline between the years compared. The earlier cohort entered the labour market prior to the most recent expansion, the later cohort after it. Looking simply at the ratios, by gender, of all those active in the labour force, including self-employed, full-time and part-time employees, will give some indication of how the structure of the labour market in the relevant age groups has changed in relation to economic restructuring and cultural (essentially, work patterns related to labour market entry ages and family-building stages) has changed, and enable us to better interpret the data in Table 2, that follows it.

[**Table 1 to be added**]

[6] Examples included being asked in interviews about how they would manage male subordinates, and subjected to a range of sex-stereotyping comments (including sexual harassment in some cases) that required considerable diplomacyon their part;

The analysis in Table 2 is confined to the over-25 to 35 year age groups, to take account of the greater incidence of employed graduate in these categories who might be expected to have advanced beyond gap ye ars and Master's degrees and accessed the labour market with a view to career development, mostly prior to taking on extensive family-building responsibilities. In this Table, we examine the changing relationships between the proportions that had degrees, occupational gender ratios and the gender pay gap.

Table 2: Trends in the graduate labour market, by occupation, gender and earnings, 26-35 year olds* in 1993-94 and 2004-06

	Employment change 93-06	% with degree		% female		Graduate premium (%) (full-time only)		Average female graduate earnings as a % males (full-time only)	
		93-94	04-06	93-94	04-06	93-94	04-06	93-94	04-6
Traditional graduate occupations	**Strong growth**	**82**	**82**	**44**	**51**	**15**	**6**	**89**	**87**
Within which:									
Medical practitioners, psychologists	**Strong growth**	**86**	**73**	**30**	**51**	**48**	**23**	**86**	**87**
Biological scientists, biochemists	**Growth**	**79**	**85**	**45**	**56**	**69**	**15**	**92**	**92**
Judges, barristers, solicitors	**Growth**	**91**	**86**	**44**	**49**	**..**	**..**	**82**	**82**
Actuaries, economists, mgt consultants	**Strong growth**	**60**	**75**	**43**	**39**	**29**	**19**	**79**	**81**
Modern graduate occupations	**Strong growth**	**51**	**67**	**37**	**43**	**1**	**7**	**79**	**82**
Within which:									
Software engineers, programmers	**Growth**	**45**	**63**	**19**	**17**	**8**	**10**	**93**	**103**
Primary, nursery education teachers	**Strong growth**	**82**	**91**	**84**	**85**	**7**	**3**	**100**	**92**
Social workers, probation officers	**Stable**	**31**	**61**	**68**	**87**	**7**	**22**	**99**	**104**
Newgraduate occupations	**Growth**	**37**	**54**	**38**	**46**	**20**	**20**	**83**	**79**
Within which:									
Personnel, training etc managers	**Stable**	**40**	**57**	**61**	**63**	**31**	**30**	**79**	**94**
Chartered & certified accountants	**Declining**	**46**	**61**	**30**	**46**	**25**	**23**	**82**	**76**
Laboratory technicians	**Strong decline**	**33**	**52**	**45**	**57**	**59**	**6**	**107**	**89**
Niche graduate occupations	**Stable**	**15**	**32**	**43**	**46**	**24**	**25**	**87**	**76**
Within which:									
Nurses	**Declining**	**4**	**32**	**89**	**84**	**22**	**16**	**101**	**99**
Police officers - sergeant & below	**Declining**	**7**	**27**	**14**	**29**	**-3**	**9**	**80**	**93**
Non graduate occupations	**Declining**	**3**	**9**	**46**	**46**	**23**	**14**	**94**	**88**
Within which:									
Vocational, industrial trainers	**Strong growth**	**24**	**32**	**56**	**61**	**17**	**20**	**..**	**105**
Accounts clerks, book-keepers etc	**Declining**	**9**	**20**	**75**	**72**	**60**	**29**	**84**	**93**
Sales assistants	**Strong decline**	**7**	**25**	**66**	**79**	**39**	**27**	**..**	**103**
All occupations	**Declining**	**15**	**28**	**44**	**46**	**42**	**44**	**84**	**81**

Source: UK Labour Force Surveys, 1993-94 and 2004-06. Information above is for the 26-35 age range in each period.

Note: ' Strong growth' means >50% growth over the 11-12 year period. 'Growth' means 5-50%; 'Stable' is +/- 5% change; 'Declining' means -5 to -50% decline; 'Strong decline' means > -50% decline.*NB, the age groups in the final version of this table will change slightly when we include 21-35 year olds rather than the current 26-35 year olds included.

The overall picture largely reinforces our earlier analyses (e.g. Elias and Purcell 2005). We look at each category in turn, and at particular examples within it.

Traditional graduate jobs

The proportion of the workforce and the aggregate overall number of full-time jobs in this category have remained stable, but there has been strong growth in numbers employed in this category for this age group. However, we can see from the examples given that there has been stronger growth in some areas than others, and although this has not all been met by graduates in full-time employment, much of it has, especially in the 'newer' professions of economics, scientific specialism and management consultancy where it is clear that there has been an increase in demand for highly-qualified entrants : not always met, which is a concern for UK policy-makers, as discussed by Wilson (2009, 2008) in recent reports. The big change among young adults in *traditional* graduate jobs has been the extent to which women have increasingly accessed these largely established professional, relatively *elite* occupations. In aggregate, women in the age group have moved from being just over 40 per cent at the start of the period analysed to over half. In traditional graduate jobs as a whole, the proportion of job incumbents with degrees has remained remarkably stable, but the graduate premium overall has marginally fallen and is likely to fall further as opportunities in private sector employment decline relative to public sector employment in the current recession. The slight increase in the gender pay gap may reflect the impact of feminisation over the full range (which of course requires further exploration) or it may reflect change in the balance of different jobs within the category. For example, if the relative demand for civil engineers had fallen and there were few opportunities in 'traditional male jobs' requiring skills more often gained by men (as happened in skilled manual work in the mid-20th century) relative to less well-paid jobs in teaching, so that more men were entering teaching, we would expect the gender pay gap to decrease and, in the reverse case, the gap to rise.

In the selected occupations we examine, the interaction of these variables provides some clues. Among medical practitioners, the slight fall in the proportion of graduates probably may reflect the increase in practitioners of 'non-traditional' medical specialisms – often practicing in the private sector where they can charge higher fees than perhaps their relative skills and qualifications would attract in the National Health Service (NHS). However, women's share among young members of the profession has increased significantly as equal opportunities in education and employment have become progressively more established and impacted upon women's aspirations and perceptions of what is possible. In an area of employment where empathic and caring skills are frequently a central component of occupations, it might be expected that traditional sex-typing and gendered patterns of socialisation would reinforce to equality-stimulated increase in women's participation. It is perhaps surprising that the gender pay gap has remained remarkably stable between the two early career full-time cohort snapshots. However, the graduate premium has fallen significantly, which suggests that, as with the transfer of office administrative work from 'black coated workers' to women throughout the 20th century (Crompton 1988, Lockwood 1966), feminisation – or reorganisation of some areas of employment in the profession as part-time jobs – like family planning and child welfare specialisms, generally filled by women - may be devaluing some, at least, areas of professional skills.

The trends among the other 'old profession' of the law show a significant reduction in graduate density among full-time employees, along with a considerable increase in the representation of women in this age group. Their apparent overall impact on the gender pay gap has been negligible, which may reflect their greater numbers in the more junior positions and scarcity in the higher reaches, but it is well documented until recently, at least, that women are less likely to enter the very competitive high-income areas such as company and libel law and more likely to work in public sector, family law or legal aid specialisms. Change in the graduate premium cannot be reliably computed for these age groups as the pay rates of new entrants has been increased to enable wider access to what was traditionally a very elite occupation that paid little at the training stages and required supplementary private income. Further analyses will be undertaken here in relation to Table 1 findings prior to the conference.

Modern graduate jobs

The overall numbers of *Modern* graduate jobs has strongly increased in this age group, as has women's share of them, along with a surprisingly modest graduate premium and a reduction in the gender pay gap. However, the occupations selected as exemplars illustrate the diversity and profoundly-gendered profile of this category for which the main common feature is the fact that they became graduate jobs during the economic restructuring and higher education expansion of the 1960s. Insofar as these figures are accurate reflections of the overall pattern, it looks as if most of the growth of has been of graduate opportunities in occupations where graduate

density has increased as older incumbents have retired and younger, more highly-qualified ones have succeeded them.

Looking at these occupations, women's share of the engineering jobs has remained virtually stable, and perhaps it is not surprising that, as such a small proportion of a male-dominated profession, they are likely to be extremely committed, and able, and this might be reflected in earnings somewhat higher, on average, than the other 83 per cent of their occupational peers. As far as primary and related teachers are concerned, it appears that although the gender ratios in this female-dominated occupation have remained stable in this age group, men have been entering the profession in larger numbers between the periods studied and achieving a gender premium in the process. The social work trends initially look odd, but provide an interesting example of a caring occupation where qualifications became progressively more important in the 1960s but where age – and maturity – led to later than average occupational entry and greater than average post-experience study for credentials and higher rates of initial periods of working as unqualified trainees. The most recent figures suggest that qualifications are increasingly becoming a prerequisite in the younger age groups. The concurrent rise in the graduate premium supports this picture of a vertically-segmented increasingly female-dominated occupation. It is also an occupational group characterised increasingly by high pressure due to tighter legislation, greater public and professional accountability and widespread disillusion resulting from these and increasingly intensified workloads, exacerbated by 'burn-out', stress and low recruitment rates. Given the relatively low-paid, mainly public sector work, the nature of the work and the preponderance of women in the profession, it is not surprising that parity of earnings has been achieved and, if anything, women' average earnings are marginally higher than men's.

New graduate jobs

New graduate jobs appropriately exhibit the biggest increase in graduate density. However, as women's share of full-time employment in this age group has increased, the graduate premium appears to have remained stable overall and, where there has been movement in particular comparable occupations, more likely to have declined than risen, which suggests that either these jobs may be more segmented, albeit with large graduate niches within them, or that increasing proportions of graduates may be working at the 'less responsible' end of them or in different, less well-paid, areas of the economy. 'Personnel manages' is a good example of an occupation where women with this job title are more likely to work in public services and less likely to work in the private sector, as we have shown earlier (Purcell and Elias, 2008 *op.*cit). This may also explain the gender difference in the laboratory technician category. At one end of the spectrum, lab technicians working with advanced scientific technology are required to have PhDs, whereas at the other a schools lab technician, for example is likely to be a non-graduate, essentially, cleaning and assistant-level post, that newly-qualified graduates with lower grade scientific degrees might well prefer to other routine and low-paid occupations accessible to them if the graduate labour market in which they seek employment offers few alternatives.

Niche graduate jobs

These jobs represent a very substantial area of graduate employment growth in recent years, with double the proportions employed in them at the second snapshot cohort – although as an aggregate occupational group, demand has remained stable and in significant cases, declined. This reflects the interplay of an interesting set of dynamics: change in the credentials and skills required to enter or to undertake (an interesting distinction!) an increasing number of jobs – and, it is likely to be the case, an over-supply of graduates with 'inappropriate' skills and knowledge to meet the graduate labour demand. In occupational areas such as nursing and the police service, they reflect very deliberate policies on the part of the employers to raise entry standards and level of professionalism in them, and indeed, nursing has now become almost wholly a graduate-entry profession now., as these figures show and the entry regulations now require, reflecting the pursuit of greater efficiency and cost-effectiveness: smaller, but more professional workforces, amplified by less highly-paid, skilled (and cheaper) administrative and support roles. As credentials have become more of a pre-requisite than more nebulous assessments of suitability, women have increasingly entered many of these occupations, but as they have become more professionalised and presenting a range of career development routes, allied to equal opportunities legislation that challenges gender-typed roles and promotes greater recognition of gender stereotyping as an obstacle to 'non-standard' career choices, in the same way that women have entered 'male jobs' more, men have entered some 'women's areas' more – and nursing is a good example of this. In nursing, recently re-classified as a professional occupation (SOC2010, forthcoming) where, as it has been accepted as a profession where skills and knowledge rather than gender are the key attributes and pay levels have been raised to attract more able candidates, more men have seen the occupation as a career option. In this age-group, gender earnings parity has clearly been achieved, but it will be interesting to see if this changes if men become an increasing proportion of the workforce.

Non-graduate jobs

As analysis of the full labour force revealed at the outset of this paper, non-graduate employment, particularly routine work requiring no skills or qualification, represents is a diminishing proportion of jobs, particularly full-time jobs. We have been puzzled in previous analyses of graduate outcomes that although it has been clearly the case that graduates in these 'non-graduate 'jobs are generally accurately classified as not requiring or using higher education when, in interviews, they described their tasks and responsibilities and their conditions of employment, there were clearly 'graduate niches' in some of these. Examples are vocational trainers and indeed, physical fitness and sports trainers in the sport and leisure industry, and at higher end of retail trades and the lower reaches of accountancy, all strong growth areas, where job titles sometimes led to mis-classification. Graduates we interviewed who were employed in these were generally found to be in jobs that required their vocational degrees – vocational trainers, sports science, accountancy trainees in 'graduate-entry' schemes, even highly-specialist technical retail workers. However, most did not. The more than doubling of sales assistants and accounts clerks, the increased numbers of graduates employed in call centres and the hospitality industry does largely reflect underemployment of graduates. We have argued in the past – and it is clear from our 1995 and 1999 longitudinal survey work history evidence - that the transition from higher education to employment in the UK, as in most developed countries, is complex and varies substantially by academic qualification and the wider diversity of graduate attributes that influence aspirations and access to opportunities. Career trajectories for the first 3-4 years after graduation, except in the cases of graduates who clearly chose vocational options for study, have been becoming an increasingly poor indication of labour market integration, as 'gap years' and what might be called 'the transition from youth to citizenship' has extended, ages of family-building have risen, particularly among the highly-qualified, and gender relations have changed. Graduates in 'non-graduate' jobs in the early years after HE course completion may be under-employed because of lack of alternatives, lack of appropriate skills and knowledge, or as a chosen short-term expedient in relation to other values or social considerations such as location or relationships. Gender and social class background are clearly a very significant variable in this.

Appendix 1

Table A1 Factors associated with the annual earnings of 1995 graduates in full-time employment seven years after graduation

	Coeff.	Std. Error	Sig.	Mean Males	Females
Hours per week (exc. breaks but inc. o/t, unpaid)	0.009	0.000	0.000	44.2	42.3
Contractual basis of current job					
Permanent/open-ended	ref.			84.8%	82.1%
Fixed term contract	0.020	0.005	0.000	8.7%	9.9%
Probationary	-0.033	0.011	0.002	1.1%	1.6%
Self-employed	0.080	0.008	0.000	3.9%	3.8%
Temp (agency)	0.140	0.015	0.000	0.4%	1.0%
Other temporary or casual	-0.109	0.024	0.000	0.0%	0.5%
Other (not permanent)	-0.097	0.020	0.000	0.3%	0.5%
Degree was required to obtain current job	0.157	0.003	0.000	64.3%	69.8%
Sector of current job					
Agriculture, mining	-0.109	0.012	0.000	1.6%	1.1%
Manufacturing	-0.121	0.006	0.000	12.2%	6.9%
Electricity, gas, water	-0.084	0.011	0.000	2.3%	0.9%
Construction	-0.168	0.008	0.000	8.9%	1.4%
Distribution	-0.108	0.007	0.000	5.4%	4.2%
Transport	-0.142	0.011	0.000	2.4%	0.9%
Information and communications	0.005	0.005	0.384	14.3%	9.6%
Banking, finance and insurance	ref.			11.5%	7.0%
Business services	-0.027	0.006	0.000	11.2%	12.3%
Education	-0.135	0.007	0.000	9.1%	24.8%
Other public services	-0.141	0.007	0.000	12.6%	22.8%
Other	-0.151	0.007	0.000	7.2%	6.5%
Private sector	ref.			70.2%	46.8%
Public sector	-0.096	0.005	0.000	24.4%	45.6%
Not for profit sector	-0.158	0.006	0.000	4.4%	6.7%
In my workplace, my type of work is done					
exclusively by men	ref.			20.2%	6.3%
mainly by men	0.022	0.004	0.000	34.2%	15.4%
by equal mixture of men and women	-0.049	0.004	0.000	37.5%	40.3%
mainly by women	-0.109	0.005	0.000	6.3%	29.1%
exclusively by women	-0.126	0.008	0.000	0.5%	8.0%
After first started this job, to learn to do it reasonably well took					
< 1 week	-0.030	0.006	0.000	6.1%	3.4%
1 week to 1 month	-0.022	0.004	0.000	11.4%	11.5%
1 - 3 months	-0.055	0.003	0.000	24.3%	24.7%
Over 3 months	ref.			58.2%	60.4%

(contd.)

	Coeff.	Std. Error	Sig.	Mean	
				Males	Females
Use of computers in current job					
Do not use computers in job	ref.			1.9%	3.4%
Routine use of computers in job	0.199	0.008	0.000	51.7%	70.0%
Complex use of computers in job	0.166	0.008	0.000	28.8%	21.1%
Advanced use of computers in job	0.257	0.009	0.000	16.9%	5.1%
No employed by the organisation works for					
< 10 employees	ref.			5.1%	5.4%
10 - 24 employees	0.142	0.008	0.000	5.7%	6.8%
25 - 49 employees	0.145	0.008	0.000	5.7%	8.7%
50 - 199 employees	0.151	0.007	0.000	15.2%	15.2%
200 - 499 employees	0.175	0.008	0.000	9.9%	8.5%
500 - 999 employees	0.171	0.008	0.000	6.3%	8.3%
1000+ employees	0.233	0.007	0.000	51.4%	46.1%
SOC(HE) classification of current job					
Traditional graduate job	0.152	0.005	0.000	20.0%	26.0%
Modern graduate job	0.102	0.005	0.000	21.1%	21.1%
New graduate job	0.201	0.005	0.000	20.0%	18.5%
Niche graduate job	0.136	0.005	0.000	23.2%	20.5%
Non-graduate job	ref.			11.5%	10.8%
Not classified	0.088	0.008	0.000	4.1%	3.2%
Currently employed in					
Inner London	0.252	0.004	0.000	17.2%	16.8%
Outer London	0.184	0.005	0.000	7.0%	5.8%
South East	0.089	0.004	0.000	14.8%	13.1%
Elsewhere	ref.				
Male	0.075	0.003	0.000	100.0%	0.0%
Age	0.113	0.013	0.000	29.5	29.1
Age squared	-0.002	0.000	0.000	871.8	852.5
Disability	-0.089	0.010	0.000	1.7%	1.4%
Other work limiting factor	-0.105	0.008	0.000	2.1%	2.7%
Lives with partner and children	0.031	0.004	0.000	14.0%	7.9%
Lives with parents	-0.200	0.004	0.000	11.4%	7.7%
Shared accommodation	-0.100	0.004	0.000	12.1%	9.4%
Lives alone	ref.				
Has children age 6-11	0.042	0.010	0.000	2.4%	1.2%
Fee paying school	0.039	0.004	0.000	16.2%	14.5%

(contd.)

	Coeff.	Std. Error	Sig.	Mean	
				Males	Females
Class of degree obtained in 1995					
First class degree	ref.			10.6%	8.0%
Upper second	-0.030	0.003	0.000	43.2%	51.0%
Lower second	-0.050	0.004	0.000	29.6%	29.3%
Third	-0.115	0.007	0.000	4.5%	2.4%
Subject area of 1995 degree					
Arts	-0.181	0.009	0.000	1.7%	3.2%
Humanities	-0.122	0.006	0.000	7.8%	11.8%
Languages	-0.108	0.008	0.000	1.4%	5.7%
Law	0.029	0.008	0.000	3.4%	4.1%
Social sciences	-0.037	0.005	0.000	12.9%	16.6%
Maths and computing	0.051	0.006	0.000	10.1%	4.5%
Natural sciences	-0.093	0.005	0.000	12.8%	11.1%
Medicine and related	0.057	0.007	0.000	3.9%	9.7%
Engineering	-0.018	0.006	0.002	16.8%	2.3%
Business studies	ref.			14.0%	11.3%
Education	-0.018	0.007	0.008	2.7%	10.5%
Other vocational	-0.070	0.006	0.000	9.7%	4.6%
Interdisciplinary	-0.105	0.008	0.000	2.7%	4.5%
Entry qualifications for 1995 degree					
24+UCAS points	0.003	0.004	0.451	17.6%	20.7%
16-23 UCAS points	ref.			18.7%	25.1%
less than 16 UCAS points	-0.052	0.004	0.000	17.8%	18.3%
Scottish or Irish Highers	-0.002	0.005	0.753	8.8%	8.7%
Access qualifications	-0.208	0.014	0.000	1.0%	0.6%
Foundation course	0.039	0.014	0.005	0.8%	1.0%
HND/HNC	-0.026	0.005	0.000	10.6%	4.0%
GNVQ or equiv.	0.097	0.015	0.000	0.9%	0.6%
Int. baccalaureate	0.118	0.023	0.000	0.4%	0.1%
O' levels	0.153	0.026	0.000	0.3%	0.2%
BTEC, OND, ONC	-0.064	0.008	0.000	2.9%	2.4%
First degree	-0.254	0.018	0.000	0.3%	0.7%
Postgrad qual.	-0.374	0.126	0.003	0.0%	0.0%
Other qual.	-0.117	0.009	0.000	2.0%	1.7%
Further education and training since 1995					
Short course(s)	-0.032	0.003	0.000	24.8%	32.0%
Undergraduate degree	0.018	0.008	0.019	3.2%	2.2%
Postgraduate cert. or dip.	-0.019	0.003	0.000	16.0%	31.7%
Professional qualification	0.055	0.003	0.000	22.7%	23.5%
Master's degree	-0.040	0.003	0.000	16.1%	19.1%
Phd Programme	-0.127	0.006	0.000	5.8%	5.6%
Other	-0.020	0.005	0.000	6.9%	10.4%
None	ref.				

(contd.)

	Coeff.	Std. Error	Sig.	Mean	
				Males	Females
Moved between regions (pre degree home and current employment)	0.014	0.003	0.000	51.9%	48.4%
Parental socio-economic class:					
Managerial and professional occupations	ref.			46.7%	45.6%
Intermediate occupations	-0.033	0.004	0.000	11.2%	11.3%
Small employers and own account workers	0.023	0.004	0.000	15.2%	17.6%
Lower supervisory and technical occupations	-0.016	0.006	0.004	6.0%	4.6%
Semi-routine and routine occupations	-0.027	0.004	0.000	11.4%	9.7%
Neither parent in paid employment	-0.089	0.009	0.000	1.9%	1.8%
Not determined	0.018	0.005	0.000	7.6%	9.5%
Constant	0.201				

Adjusted R^2 = 0.502
Weighted N = 59,956
Unweighted N = 3,286

Note: All independent variables are represented by 0, 1 values, except for age, age squared and weekly hours worked which are continuous. With the exception of these variables, mean values of the variables are displayed as the percentage in each category coded to the value 1

The dependent variable is the natural logarithm of annual gross earnings. The coefficients associated with each variable can be regarded as the percentage change in earnings associated with each variable, relative to the reference variable in each set (denoted by 'ref.')

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