The Postgraduate Premium:

Revisiting Trends in Social Mobility and Educational Inequalities in Britain and America

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Foreword

Stagnant social mobility comes at a substantial social and economic cost. For the last 15 years, the Sutton Trust has sought to address the problem through education, with research and programmes from the early years, through school and university access, to access to the professions.

While there have been some improvements in overall university access for the poorest students, there remain huge challenges, particularly in our leading universities and at postgraduate level.

Some challenges are becoming even more acute, as this timely report for the Sutton Trust by Professor Stephen Machin and Dr Joanne Lindley, at the Centre for Economic Performance at the London School of Economics and the University of Surrey, demonstrates.

When I was growing up, there were many professions that were open to young people with good A-levels. More recently, an undergraduate degree has become essential for many of those careers. Now, we find that a postgraduate degree is increasingly expected, with a remarkable 11 per cent of people in work, aged 26-60, holding a degree at this level.

Of course, a better educated workforce should be good for Britain. Brainpower is what adds value in today's economy. But it is essential that this should not come at the expense of widening inequalities of access to these professions.

Postgraduate study is becoming increasingly the preserve of the better off student, both from home and abroad. That situation will be further exacerbated with £9000 annual undergraduate fees for English students. Graduates facing debts in excess of £40,000 through undergraduate student loans are likely to see the prospect of funding a further £20,000 a year in fees and living costs, without having access to student loans, truly daunting. The Sutton Trust has been concerned that £9000 is too high and we believe undergraduate tuition fees should be means tested.

But unless we address the issue, there is a real danger that we are squandering the talent of a generation, and losing the chance to stretch our brightest minds, so that they develop the innovations and ideas that will be essential to our economy in the future. At the same time, the higher wage premium – around £5500 a year more on average – enjoyed by postgraduate degree holders threatens further to widen income inequalities, reducing social mobility.

It is not easy for Government at a time of public spending restraint to consider improved funding for access to postgraduate study. Yet few investments have the potential to create such significant economic gain. The Higher Education Commission last year urged ministers to extend the student loan scheme in a targeted way to postgraduate study. That would be a good start. But we need to have a much more concerted effort by government, universities and the professions to ensure that postgraduate study is about stretching the brightest minds and not simply dipping into the deepest pockets.

As well as focusing on postgraduate qualifications and wage premiums, this report also shows a more encouraging story of improved gender equality. Women's education levels are now just as high as men's in the UK, and that has been a major factor in reducing gender wage differentials in recent decades.

Of course, not everyone has benefited from these changes, and the report shows how those without a higher education in both Britain and America are losing out even more.

I am very grateful to Professor Machin and Dr Lindley for their new research. I hope it helps spur the action needed to ensure that postgraduate study is open to all those with the ability to contribute to the advancement of knowledge and understanding.

Sir Peter Lampl
Chairman
The Sutton Trust and the Education Endowment Foundation

Summary

This report revisits the debate about why social mobility levels are relatively low in Great Britain and the United States of America compared to other countries. It focuses on three main areas within this debate: the changing role of educational inequalities; the expectation of ever higher levels of education as revealed in increasing numbers of workers holding postgraduate degrees; and potential differences by gender.

Both Britain and the US have shown significant educational upgrading over time. By 2011 in Britain, the proportions of male and female graduates in the workforce converged and are now very similar. This gender convergence occurred earlier in the US (around the mid-1990s), where women workers now have higher levels of education on average than their male counterparts.

As these significant education upgrades have occurred, educational inequalities by family income have risen in both countries through time. This has reduced social mobility as people with the highest education levels increasingly come from richer backgrounds, whilst the relative wages of the more educated have risen.

There has also been an increase in the numbers of postgraduates - those staying on in higher education after obtaining their undergraduate degree. 11 per cent of people in work (aged 26-60) in Britain now hold a postgraduate qualification, up from 4 per cent in 1996.

In the past, employers used to accept O-levels or A-levels for many jobs. More recently, a Bachelor's degree was expected. Now, graduates seek to distinguish themselves increasingly by acquiring a postgraduate degree. But as the requirements of the labour market have become more demanding, this has exacerbated educational inequalities as workers with postgraduate degrees increasingly come from richer family backgrounds.

There is a significant wage premium for those with postgraduate qualifications. Somebody with a Master's can on average expect to earn £5,500 more a year – or £200,000 over a 40 year working life - than someone only holding a Bachelor's degree. In the US, the annual premium is almost twice as high - $16,500 (£10,300).

Women's increased education has proven to be a key factor in narrowing gender wage differentials over the last thirty years. There are now equal numbers of male and female postgraduate students in the UK, and women constitute the majority of postgraduates in the US. However, men and women have also been equally affected by changes in educational inequality in Britain, as education-related wage differentials grow.

These patterns of rising wage differentials for those with the highest levels of education, coupled with rising higher educational inequality by family income, will make it harder to shift the already low levels of social mobility in Britain and America. As educational expectations grow and the economic and social position of workers with no or limited qualifications (especially men) has worsened, the need to improve the education and training of a significant section of the workforce becomes ever more important.

Recommendations

It is vital that our brightest graduates are not priced out of postgraduate study. Therefore, a targeted state-backed loan scheme should be introduced to support postgraduate students from low and middle income backgrounds.

With postgraduate qualifications increasingly essential in many professional careers, Government, professional associations and universities should develop a coherent offer, including bursaries, to enable good graduates from low and middle income backgrounds to continue their studies without incurring significant extra debts.

The impact of the new £9000 fee arrangements for undergraduates on the social mix in postgraduate education should be kept under careful review, so that appropriate action can be taken where it can be demonstrated that it is further reducing social mobility.

The Office for Fair Access should look at universities' postgraduate recruitment patterns as part of their annual assessment of access agreements, and consider what steps are being taken to ensure a broad social intake.

HEFCE should help improve our understanding of postgraduate study and financing by collecting data on fees, costs and the socio-economic background of students.

Action should be taken by the professions – building on successful programmes already operating in fields such as the Law – to ensure that they fully represent the talents of society as a whole, and not just a narrow elite.

1. Introduction

Notwithstanding controversial discussions at the time and subsequently, research undertaken for the Sutton Trust in the mid-2000s (Blanden, Gregg and Machin, 2005) reported that social mobility fell in Britain for a cross-cohort comparison of individuals born in 1958 and 1970, and that Britain, along with the United States, had lower mobility levels than other developed countries. Underpinning these lower levels and decline in social mobility were high and rising levels of educational inequality, coupled with rising wage inequality in the labour market.

In this report, we revisit the debate about trends in social mobility in Britain and America. Certain aspects of rising inequality and falling social mobility remain not well understood. One feature of this is a need to generate a better understanding of the ways in which higher educational levels have produced economic benefits for some individuals and how these have translated into changing levels of social mobility. This forms the focus of this report, where we examine in some detail how the continued quest for more education in Britain and the United States has manifested itself, in terms of both in affecting inequality within generations and mobility across generations.

How does this link between education and inequality impact on social mobility? The first observation is that, despite the supply of more educated workers rising very rapidly in recent decades, wage differentials between workers with more education and workers with less education have risen over time as employers have increased their demand for high education individuals. The second point is that rising education levels and educational wage differentials not only matter for inequality within generations, but also have potentially important implications for the level of social mobility across generations and for its evolution through time. If individuals from wealthy backgrounds acquire more education and get a wage payoff for this education, already existing inequalities are transmitted more strongly across generations and social mobility falls.

We explore these mechanisms in this report, presenting new findings from Britain and America from a range of large scale micro-data sources. We present estimates of changing educational inequalities by family income and on changing wage differentials using more up to date data than in earlier work. We also consider some new or relatively unexplored dimensions of these. The first looks at variations within the graduate group, which has in most social mobility research been treated as a homogenous group. It turns out that, in recent time, a key feature of rising heterogeneity within the graduate group has been the rise of the postgraduate worker, and we study the implications of this for social mobility. The second area we place more attention on is possible differences by gender, both in terms of shifts in education and relative wages, and critically assess whether gender specific changes play a role in the evolution of social mobility through time.

The report is structured as follows. It begins in Section 2 by presenting evidence on what has happened to education acquisition and educational inequalities in Britain and America over the last thirty years. Section 3 documents how these changes have mapped into changing educational wage differentials in the labour market through time. Section 4 discusses the implications of the trends described in Sections 2 and 3 for

social mobility, linking them back to the earlier findings, and placing them into policy perspective. Section 5 concludes.

2. Trends in Education of the Workforce and Educational Inequality

Education Employment Shares Over Time

Table 1a uses Labour Force Survey (LFS) data for Britain, and Table 1b uses Current Population Survey (CPS) data for the US, to show trends in employment shares for five year intervals over the last thirty years in five education categories. Ordered from lowest to highest, for Britain (GB) and the United States (US), the categories are:

Great Britain	United States
i) No qualifications	i) High school dropout
ii) Intermediate 1 - if an individual's highest qualification is a school-level qualification up to and including A levels (or an equivalent level diploma via further education).	ii) High school graduate
iii) Intermediate 2 - if an individual's highest qualification is a professional qualification, or a teaching and nursing qualification.	iii) Some college
iv) Undergraduate degree	iv) College degree
v) Postgraduate degree	v) Postgraduate degree

For Britain, only four education categories are observed for the whole period, 1981-2011, as the higher education (HE) category can only be further disaggregated in a consistent manner through time from 1996 onwards. For the US, CPS data refers to earnings from the previous year and so the most recent data available are from the 2012 CPS so that the US time period runs from 1981 to 2011.[1]

The patterns of changes in the employment shares by education are striking. Over the last thirty years, a huge educational upgrading has occurred in both countries. For Britain, Table 1a shows that in 1981, 58 per cent of the adult (aged 26-60) workforce had no qualifications. In the same year, 5 per cent had a degree. By 2011, the per cent proportion without qualifications fell to a mere 5 per cent, whilst 31 per cent had a degree. Similarly, Table 1b shows that in the US the percentage of high school dropouts fell from 18 per cent in 1981 to 7 per cent in 2011, whilst the percentage with a degree increased from 23 to 37 per cent over the same time period.

[1] It would be of potential interest to study degree subject (in Britain) or field of major (in the US), but unfortunately information on institution and subject major are not available for either countries over the full time period we study.

Table 1a: Employment Shares by Education, Great Britain

A. All	1981	1986	1991	1996	2001	2006	2011
No Qualifications	0.58	0.47	0.33	0.16	0.11	0.08	0.05
Intermediate 1	0.23	0.29	0.43	0.53	0.55	0.53	0.52
Intermediate 2	0.14	0.16	0.15	0.17	0.16	0.15	0.12
Undergraduate Degree or Higher	0.05	0.07	0.09	0.14	0.18	0.23	0.31
Of which:							
Undergraduate Degree Only	-	-	-	0.10	0.12	0.15	0.20
Postgraduate Degree	-	-	-	0.04	0.06	0.08	0.11
Sample Size	96384	69861	69998	172024	163714	148705	121246
B. Men	**1981**	**1986**	**1991**	**1996**	**2001**	**2006**	**2011**
No Qualifications	0.55	0.44	0.27	0.12	0.10	0.08	0.05
Intermediate 1	0.25	0.32	0.48	0.57	0.57	0.54	0.53
Intermediate 2	0.13	0.15	0.14	0.15	0.14	0.14	0.11
Undergraduate Degree or Higher	0.07	0.09	0.11	0.16	0.19	0.24	0.31
Of which:							
Undergraduate Degree Only	-	-	-	0.11	0.13	0.15	0.20
Postgraduate Degree	-	-	-	0.05	0.06	0.09	0.10
Sample Size	47680	35131	35547	86232	81339	72654	58324
C. Women	**1981**	**1986**	**1991**	**1996**	**2001**	**2006**	**2011**
No Qualifications	0.62	0.51	0.39	0.20	0.13	0.09	0.05
Intermediate 1	0.20	0.27	0.37	0.49	0.53	0.52	0.51
Intermediate 2	0.15	0.18	0.17	0.19	0.18	0.17	0.13
Undergraduate Degree or Higher	0.03	0.05	0.07	0.11	0.16	0.22	0.30
Of which:							
Undergraduate Degree Only	-	-	-	0.08	0.11	0.15	0.20
Postgraduate Degree	-	-	-	0.03	0.05	0.08	0.10
Sample Size	48704	34730	34855	85792	82375	76051	62922

Notes: Source is Labour Force Surveys (annual for 1981, 1986 and 1991, quarterly thereafter) for people in Great Britain. Employment shares are defined for people in work aged 26 to 60. Intermediate 1 qualifications include school-level qualification up to A levels (or an equivalent level diploma via further education), whilst intermediate 2 include professional undergraduate level qualifications which are not a degree (like teaching and nursing qualifications).

There were also sharp gender inequalities in education in 1981, as described in panels B and C of the two Tables, which show employment shares for men and women separately. In 1981, Table 1a shows that 62 per cent of British women had no qualifications and only 3 per cent had a degree. Comparable percentages for men were 55 and 7. By 2011, complete convergence has occurred, and the proportions in each of the education groups are almost identical among men and women. Similarly in the US, Table 1b shows that the proportion of women with a degree increased from 20 per cent in 1981 to 39 per cent in 2011 (compared to 26 and 35 per cent for men) so proportionately more women have a degree than men by 2011 in the US with convergence occurring earlier than in Britain (around the mid-1990s). This catch-up, or more rapid expansion, for women is an important feature of the educational upgrading that has occurred. We will return to the implications for social mobility later.

Table 1b: Employment Shares by Education, United States

A. All	1981	1986	1991	1996	2001	2006	2011
High School Dropout	0.18	0.14	0.11	0.09	0.08	0.08	0.07
High School Graduate	0.37	0.37	0.36	0.33	0.32	0.30	0.28
Some College	0.21	0.22	0.24	0.28	0.28	0.28	0.28
College Degree or Higher	0.23	0.26	0.28	0.29	0.31	0.33	0.37
Of which:							
College Degree Only	0.16	0.18	0.19	0.19	0.21	0.22	0.24
Postgraduate Degree	0.07	0.08	0.09	0.10	0.10	0.12	0.13
Sample Size	54112	50675	54356	46296	47746	75535	70319
B. Men	**1981**	**1986**	**1991**	**1996**	**2001**	**2006**	**2011**
High School Dropout	0.20	0.15	0.13	0.10	0.09	0.09	0.08
High School Graduate	0.33	0.34	0.34	0.33	0.32	0.32	0.31
Some College	0.20	0.22	0.23	0.26	0.27	0.26	0.26
College Degree or Higher	0.26	0.28	0.29	0.30	0.32	0.32	0.35
Of which:							
College Degree Only	0.17	0.19	0.19	0.19	0.21	0.21	0.23
Postgraduate Degree	0.09	0.09	0.10	0.11	0.11	0.11	0.12
Sample Size	31523	28367	29408	24538	25298	39737	36521
C. Women	**1981**	**1986**	**1991**	**1996**	**2001**	**2006**	**2011**
High School Dropout	0.16	0.12	0.10	0.07	0.07	0.06	0.05
High School Graduate	0.43	0.41	0.38	0.34	0.32	0.29	0.25
Some College	0.21	0.23	0.25	0.30	0.31	0.31	0.31
College Degree or Higher	0.20	0.24	0.26	0.29	0.21	0.35	0.39
Of which:							
College Degree Only	0.15	0.17	0.19	0.19	0.10	0.23	0.25
Postgraduate Degree	0.05	0.06	0.07	0.09	0.08	0.12	0.14
Sample Size	22589	22308	24948	21758	22448	35798	33798

Notes: Source is the Current Population Survey for people in the US. Employment shares are defined for people in work aged 26 to 60.

The expansion of HE has also seen a rise in the number of workers who do not stop their education at the end of their undergraduate studies, but rather go on to get a postgraduate qualification. For Britain we can only show numbers from 1996 onwards (owing to definition changes in the LFS), but Table 1a shows the share of the adult workforce with a postgraduate qualification has increased from 4 per cent in 1996 to 11 per cent by 2011. The percentage doubles for men (from 5 to 10 per cent), but it triples for women (from 3 to 10 per cent). The percentage with a postgraduate degree has also increased in the US from 7 per cent in 1981 to 13 per cent in 2011, again with the largest of these increases being for women 5 per cent to 14 per cent compared to 9 to 12 per cent for men. This, too, has potentially important implications for social mobility that we will consider later.

It is also interesting to consider variations by different postgraduate qualification. Tables 2a and 2b therefore look at the types of qualifications postgraduates have been obtaining by looking at employment shares within the postgraduate group. We can do this for 1996 to 2011 for Britain. For the US, we can do this for 1992 to 2011 as a consequence of changes in the way postgraduate educational qualifications were recorded in the CPS after 1991. For Britain, we can identify Masters qualifications and Postgraduate Certificates in Education (PGCEs), as well as PhDs and other postgraduate qualifications. For the US, we only have three groups since

it not possible to uniquely identify postgraduate teaching qualifications and these are therefore included in the Masters category. Tables 2a and 2b show that it is evident that the share of Master's degrees has risen in both countries, whilst in relative terms the doctorate share has fallen in Britain, but risen slowly in the US. This pattern is qualitatively the same for men and women, though somewhat more pronounced for men and especially so for British men.

Table 2a: Employment Shares of Postgraduates, Great Britain

A. All	**1996**	**2001**	**2006**	**2011**
Masters	0.45	0.49	0.51	0.52
PGCE	0.21	0.21	0.23	0.23
Doctorate	0.19	0.16	0.14	0.13
Other Postgraduate	0.15	0.13	0.12	0.12
Sample Size	6898	8980	11928	11778
B. Men	**1996**	**2001**	**2006**	**2011**
Masters	0.48	0.55	0.55	0.58
PGCE	0.14	0.13	0.14	0.15
Doctorate	0.23	0.19	0.18	0.16
Other Postgraduate	0.14	0.13	0.12	0.11
Sample Size	4133	5056	6214	5591
C. Women	**1996**	**2001**	**2006**	**2011**
Masters	0.40	0.42	0.45	0.45
PGCE	0.32	0.32	0.33	0.32
Doctorate	0.11	0.12	0.10	0.09
Other Postgraduate	0.16	0.14	0.12	0.14
Sample Size	2765	3924	5714	6187

Notes: Source is Quarterly Labour Force Surveys (1996, 2001, 2006 and 2011) for people in Great Britain. Employment shares are defined for postgraduates in work aged 26 to 60.

Table 2b: Employment Shares of Postgraduates, United States

A. All	1992	1996	2001	2006	2011
Masters	0.71	0.69	0.69	0.70	0.73
PhD	0.10	0.12	0.13	0.15	0.14
Other Postgraduate	0.19	0.18	0.17	0.17	0.13
Sample Size	5263	4590	4804	8643	9288
B. Men	**1992**	**1996**	**2001**	**2006**	**2011**
Masters	0.65	0.63	0.62	0.64	0.67
PhD	0.12	0.15	0.17	0.16	0.16
Other Postgraduate	0.23	0.21	0.21	0.19	0.16
Sample Size	3150	2638	2641	4594	4569
C. Women	**1992**	**1996**	**2001**	**2006**	**2011**
Masters	0.80	0.77	0.78	0.77	0.78
PhD	0.07	0.08	0.08	0.09	0.11
Other Postgraduate	0.12	0.14	0.13	0.14	0.10
Sample Size	2113	1952	2163	4049	4719

Notes: Source is the Current Population Survey for people in the US. Employment shares are defined for postgraduates in work aged 26 to 60.

Educational Inequality by Family Income Over Time

When studying the social mobility implications of this education expansion, one needs to consider from which part of the family income distribution the most rapid upgrading has occurred. Some previous work has considered this question. Blanden and Machin (2004) showed that HE expansion in Britain (measured by degree acquisition by age 23) was much faster (more than doubling from 20 per cent to 46 per cent between 1981 and 1993) for people from the top 20 per cent of the income distribution, rose (by less, from 8 to 23 per cent) for the middle 60 per cent, and barely rose at all (going from 6 to 9 per cent) for the bottom 20 per cent. Thus educational inequality significantly rose, as over time people from richer backgrounds increased their shares in the higher education groups. This, in turn, acted as a key driver of reduced social mobility.

We reconsider this issue, studying cross-cohort changes in educational inequality in a similar way to the earlier work, but in a more comprehensive manner for both Britain and the US. Unlike earlier work, since we now have access to data on cohort members at an older age, we can improve on the education groups we can consider. In particular, we are able to break down the HE group into those with undergraduate only or postgraduates degrees, since the recent availability of the 2004 BCS means we are now able to look at highest educational qualification obtained by age 33/34. We also consider gender differences in more detail.

We do this using the British birth cohort datasets and the US National Longitudinal Surveys. For Britain, we measure educational qualifications at age 33/34 in 1991 and 2004, respectively from the National Child Development Study, the birth cohort of everyone born in Great Britain in a week in March 1958, as well as the British Cohort Study (BCS), the birth cohort of everyone born in a week in April 1970.

For the US, we use the 1979 and 1997 National Longitudinal Survey for Youth. The 1979 National Longitudinal Survey for Youth (NLSY79) follows people born between 1961 and 1964 who were of college age in 1979-1982. The 1997 National Longitudinal Survey for Youth (NLSY97) follows people born between 1979 and 1982 and who were of college age eighteen years later in 1997-2000. We use the follow-up data on employment, wages and educational attainment to measure educational qualifications at age 27-29 in 1991 for the NLSY79 and 2009 for the NLSY97.

To study educational inequality by family income, we have calculated the proportion of each HE education group within family income quintiles (measured when the cohort member was age 16 in Britain and measured at birth in the US). These are reported for the three main HE groups (undergraduate/college degree or higher, undergraduate/college only and postgraduate) in Tables 3a and 3b for Britain and the US respectively, for both cohorts and for the lowest 20 per cent of family income, the middle 60 per cent and the highest 20 per cent.

Table 3a: HE Qualifications (by Age 33/34) and Family Income, 1958 and 1970 Birth Cohorts, Great Britain

	1958 Birth Cohort, NCDS (in 1991)				1970 Birth Cohort, BCS (in 2004)				Cross-Cohort Change
	Lowest 20 Per cent	Middle 60 Per cent	Highest 20 Per cent	HE Inequality	Lowest 20 Per cent	Middle 60 Per cent	Highest 20 Per cent	HE Inequality	HE Inequality
A. All									
a) Pr[Degree]	0.09	0.12	0.28	0.19 (0.02)	0.10	0.21	0.37	0.27 (0.02)	0.08 (0.03)
b) Pr[Undergraduate	0.07	0.09	0.20	0.13 (0.02)	0.07	0.14	0.24	0.17 (0.02)	0.04 (0.03)
c) Pr[Postgraduate	0.02	0.03	0.08	0.06 (0.01)	0.03	0.07	0.13	0.10 (0.01)	0.04 (0.02)
B. Men									
a) Pr[Degree]	0.10	0.15	0.30	0.20 (0.03)	0.10	0.18	0.38	0.28 (0.03)	0.08 (0.04)
b) Pr[Undergraduate	0.08	0.11	0.22	0.14 (0.02)	0.07	0.13	0.24	0.17 (0.03)	0.03 (0.04)
c) Pr[Postgraduate	0.02	0.04	0.08	0.06 (0.02)	0.03	0.06	0.15	0.12 (0.02)	0.06 (0.03)
C. Women									
a) Pr[Degree]	0.09	0.08	0.26	0.17 (0.03)	0.12	0.23	0.36	0.24 (0.03)	0.07 (0.04)
b) Pr[Undergraduate	0.06	0.06	0.18	0.12 (0.02)	0.08	0.14	0.25	0.17 (0.03)	0.05 (0.04)
c) Pr[Postgraduate	0.02	0.02	0.07	0.05 (0.02)	0.04	0.08	0.12	0.08 (0.02)	0.03 (0.04)

Notes: Sample sizes are All - NCDS 3875, BCS 3238; Men - NCDS 2109, BCS 1598; Women - NCDS 1766, BCS 1640. Standard errors in parentheses.

Table 3b: HE Qualifications (by Age 27-29) and Family Income, NLSY 1979 and 1997, United States

	NLSY 1979 (in 1991)				NLSY 1997 (in 2009)				Cross-Cohort Change
	Lowest 20 Per cent	Middle 60 Per cent	Highest 20 Per cent	HE Inequality	Lowest 20 Per cent	Middle 60 Per cent	Highest 20 Per cent	HE Inequality	HE Inequality
A. All									
a) Pr[College Degree or	0.09	0.22	0.43	0.34	0.14	0.31	0.57	0.43	0.09 (0.041)
b) Pr[College Only]	0.06	0.18	0.33	0.27	0.11	0.25	0.37	0.26	-0.01
c) Pr[Postgraduate]	0.03	0.04	0.10	0.07	0.03	0.06	0.20	0.17	0.10 (0.024)
B. Men									
a) Pr[College Degree or	0.10	0.22	0.40	0.30	0.13	0.33	0.54	0.41	0.10 (0.058)
b) Pr[College Only]	0.08	0.18	0.30	0.22	0.10	0.26	0.35	0.25	0.02 (0.054)
c) Pr[Postgraduate]	0.02	0.04	0.10	0.08	0.03	0.07	0.19	0.16	0.08 (0.034)
C. Women									
a) Pr[College Degree or	0.06	0.23	0.44	0.37	0.14	0.31	0.60	0.46	0.09 (0.057)
b) Pr[College Only]	0.03	0.19	0.34	0.31	0.11	0.24	0.39	0.28	-0.02
c) Pr[Postgraduate]	0.03	0.04	0.10	0.07	0.03	0.06	0.21	0.18	0.11 (0.033)

Notes: Data are all weighted. Sample sizes are All - NLSY 1979, 1932, NLSY 1997, 2617; Men - NLSY 1979, 948 NLSY 1997, 1302; Women - NLSY 1979, 948, NLSY 1997, 1324.

By this metric (the gap in HE participation between the top fifth and gthe bottom fifth of the family income distribution), the upper panels of Table 3a and 3b reveal sizable HE inequalities in both countries in 1991 (0.19 for all in GB and 0.34 for all in the US). This rises strongly to 0.27 by 2004 in Britain and to 0.43 in 2009 in the US. Thus educational inequalities have risen in both countries through time and these have been drivers of falling social mobility as relative wages have risen (see the discussion of Tables 4a and 4b below). Educational inequality rises by much the same amount for men and women.

One key feature (as highlighted by Lindley and Machin, 2011) of the increased demand for graduates that has occurred through time has been the fact that many graduates no longer stop at the end of their undergraduate studies, but go on to obtain a postgraduate degree. These Tables show that, for all cohort members, the rise in educational inequality by family income is divided half and half amongst those with only an undergraduate qualification and those with a postgraduate qualification in GB, and the majority by postgraduates in the US. One way of considering this, which we return to in the discussion section below, is that the barriers to increased social mobility keep on being perpetuated by the colonisation of higher and higher educational qualifications by individuals from richer family backgrounds.

3. Trends in Educational Wage Differentials

In terms of education, for study of the other side of the social mobility coin, we need to look at the wage payoffs individuals obtain in the labour market. If the groups who have acquired more education (i.e. from the

upper part of the family income distribution) also get a bigger wage payoff, then this exacerbates already existent inequalities and reduces social mobility.

In this section, we therefore consider what has happened to wage differentials between education groups over time. Since the graduates are those whose education has risen more rapidly, and they are increasingly from wealthy families, it is this group of individuals we choose to focus upon. As in the last section, we first show what has happened for the overall adult workforce using Labour Force Survey and Current Population Survey data through time, and then focus on the cross-cohort comparisons in more detail.

Changes in Wage Differentials by HE Group

Table 4a shows LFS wage differentials for the composite graduate education groups for five year intervals between 1996 and 2011. These are estimated firstly on a pooled sample of male and female full time workers and these results are presented in panel A, but then also separately by gender where the results are presented in panels B and C. These show wage differentials by HE group (college degree or higher, college only and postgraduate) relative to the intermediate 1 level of highest qualification (as defined above), controlling for gender, a quadratic in age, whether the respondent is of white ethnicity, married/cohabiting, working in a private sector job and region of residence. For the US, Table 4b shows analogous CPS wage differentials by HE group relative to high school graduates between 1981 and 2011.

Table 4a: Changes in LFS Wage Differentials by HE Groups (Full-Timers), Great Britain

A. All	**1996**	**2001**	**2006**	**2011**	**Change 2011-1996**
Undergraduate Degree or Higher	0.428 (0.009)	0.458 (0.006)	0.457 (0.006)	0.457 (0.006)	0.029 (0.012)
Undergraduate Degree Only	0.409 (0.010)	0.425 (0.007)	0.416 (0.007)	0.416 (0.007)	0.006 (0.013)
Postgraduate Degree	0.470 (0.014)	0.531 (0.009)	0.527 (0.008)	0.545 (0.009)	0.075 (0.018)
Postgraduate/Undergraduate	0.060 (0.016)	0.106 (0.010)	0.111 (0.009)	0.129 (0.010)	0.068 (0.021)
Sample size	21300	38007	33032	26285	
B. Men	**1996**	**2001**	**2006**	**2011**	**Change 2011-1996**
Undergraduate Degree or Higher	0.401 (0.011)	0.427 (0.007)	0.415 (0.008)	0.419 (0.008)	0.018 (0.015)
Undergraduate Degree Only	0.378 (0.012)	0.391 (0.009)	0.377 (0.009)	0.383 (0.010)	0.005 (0.017)
Postgraduate Degree	0.452 (0.018)	0.505 (0.012)	0.482 (0.011)	0.496 (0.013)	0.044 (0.024)
Postgraduate/Undergraduate	0.074 (0.020)	0.113 (0.014)	0.104 (0.013)	0.113 (0.014)	0.039 (0.027)
Sample size	13621	23594	19734	15509	
C. Women	**1996**	**2001**	**2006**	**2011**	**Change 2011-1996**
Undergraduate Degree or Higher	0.474 (0.014)	0.510 (0.009)	0.515 (0.009)	0.510 (0.004)	0.035 (0.019)
Undergraduate Degree Only	0.458 (0.015)	0.479 (0.010)	0.469 (0.010)	0.459 (0.011)	0.001 (0.021)
Postgraduate Degree	0.512 (0.022)	0.577 (0.014)	0.595 (0.012)	0.612 (0.014)	0.100 (0.029)
Postgraduate/Undergraduate	0.054 (0.025)	0.098 (0.015)	0.126 (0.014)	0.153 (0.014)	0.099 (0.032)
Sample size	7679	14413	13298	10776	

Notes: The sample consists of full-time workers aged 26 to 60 in Britain Wage differentials are relative to Intermediate 1 qualifications. Control variables included are: age, age squared, no qualifications, intermediate 2, gender, white, private sector, married/cohabiting, government office region dummies and additionally gender in the All specification. Standard errors are in parentheses.

For all graduates, wage differentials rise modestly in GB and significantly in the US. The first row of panel A in Table 1a shows that the relative log wages of all GB college graduates as compared to intermediate 1 workers increased over time by around 2.9 percentage points, rising from 42.8 per cent in 1996 to 45.7 per cent in 2011. The subsequent rows however, show that there have been important differences in the growth of wages by qualification within this graduate group. The rise in the college graduate log wage premium from 1996 to 2011 has only occurred for those who have stayed on after their first degree. Indeed, the postgraduate log wage differential increased by 7.5 percentage points (from 47.0 per cent in 1996 to 54.5 per cent by 2011), whereas the log wage premium for undergraduate workers basically stayed flat over this time period (increasing by a statistically insignificant 0.6 percentage points). The strengthening of the relative wage position of postgraduate vis-à-vis undergraduate workers can be clearly seen in the final row of panel A, where the postgraduate/undergraduate log wage differential increased by 6.8 percentage points (from 6.0 in 1996 to 12.9 per cent in 2011).

Table 4b shows similar patterns for the US, where the postgraduate/undergraduate log wage differential increased by 12.6 percentage points between 1981 and 2011. These patterns are consistent with those found both for Great Britain and the United States in Lindley and Machin (2011). In both countries there is significantly faster growth in the postgraduate wage differential than in the undergraduate/college only wage differential. This, when put together with the rising HE inequality we documented in Section 2, implies falling social mobility in both countries.

Table 4b: Changes in CPS Wage Differentials by HE Groups (Full-Timers)

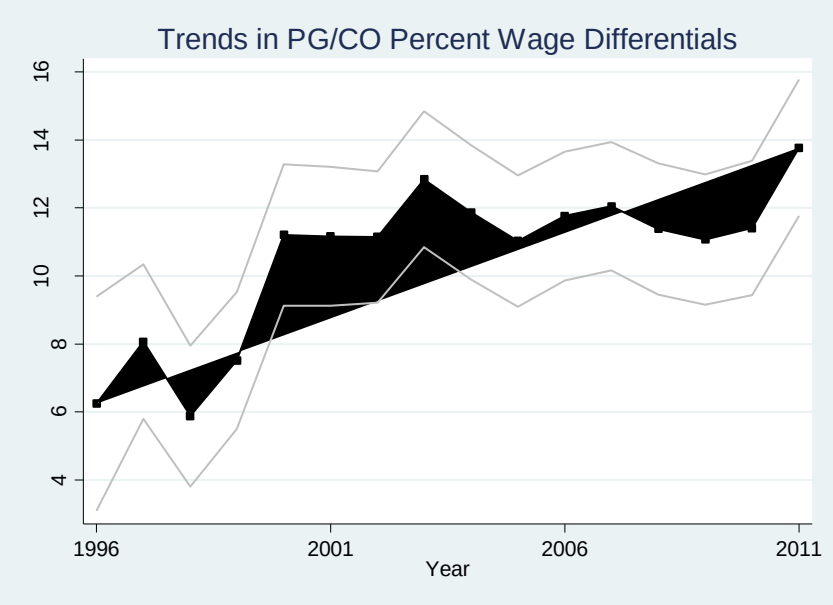
A. All	**1981**	**1986**	**1991**	**1996**	**2001**	**2006**	**2011**	**Change 2011-1981**
College Degree or	0.339	0.433	0.505	0.525	0.605	0.618	0.640	0.302 (0.010)
College Degree Only	0.300	0.391	0.441	0.423	0.532	0.540	0.552	0.252 (0.011)
Postgraduate Degree	0.425	0.527	0.631	0.682	0.752	0.774	0.803	0.378 (0.014)
Postgraduate/College	0.125	0.136	0.190	0.229	0.220	0.233	0.251	0.126 (0.014)
Sample size	29502	31258	36715	31024	50449	45984	43591	
B. Men	**1981**	**1986**	**1991**	**1996**	**2001**	**2006**	**2011**	**Change 2011-1981**
College Degree or	0.308	0.395	0.473	0.478	0.583	0.597	0.619	0.311 (0.013)
College Degree Only	0.272	0.358	0.409	0.404	0.515	0.518	0.537	0.265 (0.014)
Postgraduate Degree	0.379	0.473	0.595	0.635	0.723	0.752	0.777	0.398 (0.018)
Postgraduate/College	0.106	0.115	0.186	0.231	0.208	0.234	0.240	0.133 (0.019)
Sample size	18394	18449	20811	17492	28204	26717	23836	
C. Women	**1981**	**1986**	**1991**	**1996**	**2001**	**2006**	**2011**	**Change 2011-1981**
College Degree or	0.358	0.457	0.517	0.569	0.618	0.636	0.655	0.296 (0.015)
College Degree Only	0.309	0.416	0.457	0.500	0.543	0.564	0.562	0.253 (0.017)
Postgraduate Degree	0.492	0.589	0.648	0.728	0.770	0.790	0.821	0.329 (0.023)
Postgraduate/College	0.183	0.183	0.190	0.227	0.226	0.226	0.258	0.076 (0.024)
Sample size	11108	12809	15904	13532	22245	21131	19755	

Notes: Source is the Current Population Survey for people in the US. Wage differentials are relative to high school graduates. Control variables included are: no qualifications, high school dropout, some college, age, age squared, white, private sector, married/cohabiting, government office region dummies and additionally gender in the All specification. Standard errors are in parentheses.

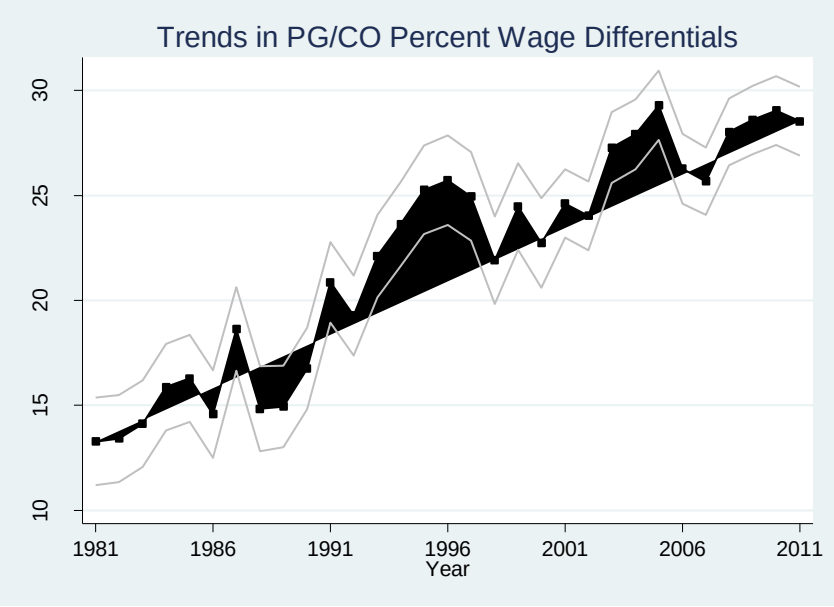
Figure 1 shows the year on year evolution of the postgraduate/undergraduate wage differential for the two countries. In Britain, the overall rise between 1996 and 2011 is characterised by a sharp rise up in the late 1990s and early 2000s, followed by relative stability, and then the suggestion of another rise in the most recent years. In the US, there is a larger increase during the more recent years. Hence, in both countries, and to a larger extent in the US, it seems that the overall wage premium for staying on in higher education after acquisition of a first degree and obtaining postgraduate qualifications is increasingly more lucrative over time.

Figure 1: Trends in the Overall Postgraduate/Undergraduate Only Wage Differential

a. Great Britain, 1996-2011.



b. United States, 1981-2011.



Notes: The squares joined by the dark line show the postgraduate/undergraduate wage differential, derived from annual estimates of the log earnings equations for all full-time workers reported in panel A of Tables 4a and 4b. These are calculated as [exp(β) - 1]X100, where β is the estimated postgraduate/undergraduate only log earnings differentials. The solid lighter lines are 95% confidence intervals.

An important addition to the existing literature is to investigate whether the wage growth of postgraduates relative to undergraduates displays any notable differences by gender. This is considered in panels B and C of Tables 4a and 4b, which show gender-specific changes over time. There is some evidence that the trends differ by gender, but also that these differ across the two countries. For Britain, Table 4a shows a bigger rise in the postgraduate/undergraduate log wage differential for women (of 9.9 compared to 3.9 percentage points for men). The faster increase in the differential occurs because of a faster increase in the postgraduate log wage differential of 10.0 percentage points for women compared 4.4 percentage points for men. The undergraduate wage differentials did not change for both men and women (where both changes are very small and insignificantly different from zero). The lack of growth is probably not surprising given the very rapid increases in the supply of graduates (especially women) documented in the previous section of the paper.

In the US, Table 4b shows larger increases for college only graduates, even if we compare these to the same starting year (1996) as for Britain, but that these are relatively similar for men and women. In terms of the postgraduate/undergraduate log wage differential, this has grown more for men (at 13.3 percentage points) than for women (at 7.6 percentage points).

Changes in Wage Differentials by HE Group and Age Cohort

It turns out that looking at gender differences for all 26-60 year olds masks different patterns of change by age cohort. This is shown in Tables 5a and 5b where wage differentials, and their changes over time, are shown separately for GB and the US by two broad age cohorts aged 26-45 and 46-60 respectively.

Table 5a: Changes in LFS Wage Differentials by HE Groups (Full-Timers) by Age Cohort, Great Britain

	Age 26-45			Age 46-60		
A. Men	**1996**	**2011**	**Change 2011-1996**	**1996**	**2011**	**Change 2011-1996**
Undergraduate Degree or Higher	0.371 (0.012)	0.390 (0.010)	0.019 (0.017)	0.482	0.478	-0.004 (0.029)
Undergraduate Degree Only	0.361 (0.014)	0.356 (0.012)	-0.005 (0.020)	0.428	0.442	0.014 (0.034)
Postgraduate Degree	0.396 (0.021)	0.470 (0.016)	0.074 (0.028)	0.534	0.542	-0.032 (0.043)
Postgraduate/Undergraduate	0.035 (0.024)	0.114 (0.017)	0.079 (0.032)	0.146	0.100	-0.046 (0.051)
Sample size	9031	9155		4590	6354	
B. Women	**1996**	**2011**	**Change 2011-1996**	**1996**	**2011**	**Change 2011-1996**
Undergraduate Degree or Higher	0.464 (0.016)	0.477 (0.012)	0.013 (0.022)	0.521	0.566	0.045 (0.037)
Undergraduate Degree Only	0.456 (0.026)	0.441 (0.014)	-0.016 (0.024)	0.475	0.480	0.005 (0.044)
Postgraduate Degree	0.486 (0.026)	0.562 (0.018)	0.076 (0.035)	0.596	0.704	0.108 (0.053)
Postgraduate/Undergraduate	0.029 (0.029)	0.122 (0.018)	0.092 (0.038)	0.121	0.223	0.103 (0.063)
Sample size	5170	6207		2509	4569	

Notes: The samples consist of full-time graduate workers aged 26 to 45 and 46 to 60 in Britain Wage differentials are relative to Intermediate 1 qualifications. Control variables included are: no qualifications, intermediate 2, gender, white, private sector, married/cohabiting, government office region dummies and additionally gender in the All specification. Standard errors are in parentheses.

The British pattern for the younger group of graduates is now very similar across men and women, with relatively constant undergraduate wage differentials and significantly rising postgraduate wage differentials combining to form a significant rise in the postgraduate/undergraduate log wage differential of 7.9 percentage points for men and 9.2 percentage points for women. A similar pattern exists in the US, but with postgraduate men doing slightly better than women. Table 5b shows the postgraduate/undergraduate log wage differential increased by 9.7 percentage points for men and 8.8 percentage points for women.

Table 5b: Changes in CPS Wage Differentials by HE Groups (Full-Timers) by Age Cohort, United States

	Age 26-45			Age 46-60		
A. Men	**1981**	**2011**	**Change 2011-1981**	**1981**	**2011**	**Change 2011-1981**
College Degree or Higher	0.268	0.594	0.325 (0.015)	0.412	0.653	0.240 (0.024)
College Degree Only	0.226	0.522	0.296 (0.016)	0.405	0.559	0.154 (0.027)
Postgraduate Degree	0.357	0.750	0.393 (0.021)	0.427	0.806	0.379 (0.033)
Postgraduate/College Only	0.130	0.228	0.097 (0.022)	0.023	0.247	0.224 (0.036)
Sample size	12808	14488		5586	9348	
B. Women						
College Degree or Higher	0.366	0.641	0.275 (0.018)	0.340	0.664	0.323 (0.031)
College Degree Only	0.319	0.553	0.234 (0.019)	0.284	0.572	0.288 (0.034)
Postgraduate Degree	0.493	0.815	0.322 (0.026)	0.497	0.815	0.319 (0.050)
Postgraduate/College Only	0.174	0.262	0.088 (0.026)	0.213	0.243	0.030 (0.055)
Sample size	7753	11830		3355	7925	

Notes: Source is the Current Population Survey for people in the US. Wage differentials are relative to high school graduates. Control variables included are: no qualifications, high school dropout, some college, age, age squared, white, private sector, married/cohabiting, government office region dummies and additionally gender in the All specification. Standard errors are in parentheses.

For the older cohorts, however, the British patterns are different across genders. Older women with postgraduate qualifications have much more sizable wage differentials in the cross-sections and do just as well through time as the younger women (in fact, numerically a little better with a rise of 10.3 percentage points). However, for men, the postgraduate differentials for the older cohort do not rise, and the postgraduate/undergraduate log wage differential actually falls by 4.6 percentage points between 1996 and 2011. For the US postgraduate men improve their position much more than postgraduate women (presumably because the very few women in this group did well in terms of earnings power back in 1981 owing to their scarcity). Overall, Table 5b shows the relative wage position of both age cohorts of US male and female graduates improving better, but postgraduates improving their wage position by significantly more.

4. Discussion of Implications for Social Mobility

Existing Work

The earlier work on falling social mobility in Britain (Blanden, Gregg and Machin, 2005, and Blanden, Goodman, Gregg and Machin, 2005) compared the cross-generation correlation of income for the 1958 and 1970 British birth cohorts and showed this correlation rose significantly across these birth cohorts. Thus, social mobility fell. A key aspect of this fall was an increased sensitivity of degree acquisition to family income (Blanden and Machin, 2004). Further investigation (by Blanden and Machin, 2008) revealed that there has been a step change down in social mobility levels for these cohorts who respectively were of the age to go to higher education in the early 1980s and early 1990s. For cohorts born after this, the level of social mobility probably did not deteriorate further. Neither, though, did it improve.

A great deal of concern has been expressed in many quarters about these trends and they have generated a lot of subsequent research and controversy, for example the debate about whether mobility really fell across the 1958 and 1970 cohorts between Blanden, Gregg and Macmillan (2011) and Erikson and Goldthorpe (2010). Both sets of authors agree that income mobility fell across the 1958 and 1970 cohorts, whilst social class mobility did not. Blanden, Gregg and Macmillan (2011) reconcile the differences by noting that income inequality rose within social class groups over time so that one sees no between-group change in social class mobility, but that the fall in income mobility occurs within social class groupings. Note also that Ermisch and Nicoletti (2007) report falling mobility from British Household Panel Survey data for the same birth cohorts.

In the US, changes in the correlation of income across generations have also been considered quite extensively in recent years. Corcoran (2001), Fertig (2003) and Mayer and Lopoo (2005) all find a fall in intergenerational persistence while studies by Levine and Mazumder (2002) and Lee and Solon (2009) have more ambiguous findings. Results for the US on educational mobility in Hertz et al (2007) show a rise in the cross-generation correlation of education.

New Results

How do the new results reported in Section 2 and 3 further contribute to these debates on changing social mobility? The first observation is that they very much reveal common patterns of change for two key factors underpinning social mobility in Britain and America. Educational inequalities by family income have risen significantly in both countries. Moreover, they appear to be gender neutral and increasingly tilted towards higher graduate qualifications. At the same time, these higher graduate qualifications are earning more in the labour market than they used to. Thus, the overall findings make it clear that the individuals who have done better in terms of wages are those people who have acquired higher education qualifications. In turn, the acquisition of higher qualifications has become more skewed towards people from more wealthy backgrounds. Thus, the labour market earnings trends we have described here have not only raised earnings inequality within generations, but have also hampered social mobility. It is people from already wealthy family backgrounds who are increasingly reaping higher rewards in the labour market from their higher qualifications.

It is notable that these patterns are present for the whole of the last thirty years, including the most recent decade that was not studied in earlier work.

Our findings also highlight some new features associated with this. First, there is clear heterogeneity within the graduate group, in terms of who has achieved more economic success through better labour market outcomes in the last thirty years or so. An interesting trend through time is that more people are acquiring postgraduate degrees and not stopping their education to enter the labour market after their undergraduate studies. This seems to be a key part of the quest for more and more education, especially the acquisition of Master's degrees. The 1980s was characterised by sharp increases in wages for undergraduates, but this seems to have slowed down more recently (possibly due to increased graduate supply finally dampening down wages in the late 1990s and 2000s) and people have recognised the need to get a postgraduate degree to distinguish themselves. Thus, a significant portion of the rise in educational inequality we described in Section 2 is from postgraduates and they have seen the biggest wage gains across the whole education spectrum, raising wage inequality and holding back social mobility.

How important in quantitative terms is this rise of the postgraduate worker? To contextualise our results, our analysis shows that, out of the 18.7 million British workers aged between 26 and 60 employed in 2011 that, 11 per cent, or 2.1 million workers held a postgraduate qualification. Out of 104.3 million workers aged 26-60 in the US in 2011, 13 per cent, or 13.6 million workers had a postgraduate degree. Workers with these advanced degrees have very clearly become a large part of the workforce in both countries.

As we have already noted the wage payoff for these workers has also gone up as postgraduate qualifications have become increasingly lucrative. How lucrative? In Britain in 2011, the mean weekly wage for a worker with an undergraduate degree only was £757 per week. So, the 2011 estimate of a 14 per cent higher wage differential for postgraduates compared to undergraduates translates into around £106 per week higher earnings, for the typical postgraduate, or (for a full year worker) just over £5,500. In 2011 in the US, the average weekly wage for a college only worker was $1,093. With a postgraduate wage premium of 29 per cent, this shows a weekly wage premium of $317, or an annual (full year worker) gain of almost $16,500.[2]

The increased presence of the postgraduate worker in the labour market, the fact that workers with such qualifications predominantly come from richer backgrounds and (even more importantly) the size of the wage return raises interesting questions in terms of the recent changes to HE financing in Britain. The £9,000 annual undergraduate fee that has been recently introduced is big, but so too are the wage returns that graduates - especially those going on to postgraduate level - can command. It will be interesting to study the social mobility consequences of this in the future. It seems very hard to see how the increased fees, coupled with increased educational inequalities higher and higher up the education hierarchy, can do anything but bolster social immobility.

[2] We have also calculated these gains for men and women, using the gender-specific wage returns in the Tables. In Britain, for men, the 12 percent postgraduate/undergraduate wage premium corresponds to an annual gain of around £5,300 and for women the 17 percent premium yields around £5,500. For the US, the 27 percent postgraduate/college only premium for men yields an annual gain of just under $18,000 and for the premium of 29 percent for women the annual gain is around $13,500.

The second key aspect that our new findings highlight is an interesting gender dimension to the patterns of change. This also has ramifications for social mobility. First of all, women's education levels were lagging some way behind men's at the start of the period we study (thirty years ago in 1981) but by 2011 they are just as high (in GB) and higher (in the US). Thus, women's increased education has proven to be a key factor in terms of narrowing gender wage differentials through time.

The gender differences thus show one aspect of the equalisation of education has been gender related. However, this has come at a cost. Men at the bottom end of the education distribution (those with no or limited qualifications) are now doing worse than women in terms of educational attainment. This, of course, can be tracked back to school where girls perform better, on average, across the board. In Britain, the higher share of young men leaving school with poor qualifications is a serious policy concern. Similar patterns can be seen in the US where men's education has been falling back quite rapidly relative to women. Autor (2010) argues that stagnating male education levels imply serious problems because men are behind at the bottom end of the education spectrum and the labour market increasingly penalises this, he also argues that there are wider negative consequences, including crime, lower marriage probabilities (as there are fewer similarly educated women) and the societal problems that ensue.

This is an important policy area and one that debates on social mobility often miss. The education aspect of social mobility debates are usually cast in terms of higher levels of achievement and (often, though not always) in terms of higher education alone. A big feature that both the postgraduate and gender dimensions of our findings show, is that those stuck at the bottom of the education distribution are falling further and further behind. This should receive a higher profile in policy discussions around social mobility than is currently the case.

5. Conclusions

This report revisits some aspects of the discussions on changing social mobility, closely linking them to changes in educational inequalities and to wage trends by education to offer an up-to-date picture of what has happened to the drivers of social mobility. A key focus is placed upon the postgraduate wage premium as a new aspect of changing social mobility.

In both Britain and America over the last thirty years, educational inequalities by family income have increased and wage differentials for the more educated have significantly risen, showing reasons why social mobility has fallen. New aspects of the area that we focus upon include heterogeneity amongst the growing graduate group where we study differences between undergraduate and postgraduate education, together with gender differences in education and wage returns to different educational qualifications.

The concluding observation is that the international comparative work on social mobility highlights that the two countries we study - Britain and America - are low mobility nations. A key question for our work is whether or

not it is able to identify patterns of change that could help to ameliorate this position. Unfortunately, the findings on recent trends and on the new dimensions of the social mobility situation we highlight seem to paint a pessimistic picture in this regard. The changing patterns of educational and labour market inequalities in both countries are moving in directions that go against improved social mobility. Given this, careful and creative thought needs to be placed upon identifying plausible policy levers that could be pulled to alter these trends and so improve the low social mobility position of Britain and America.

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