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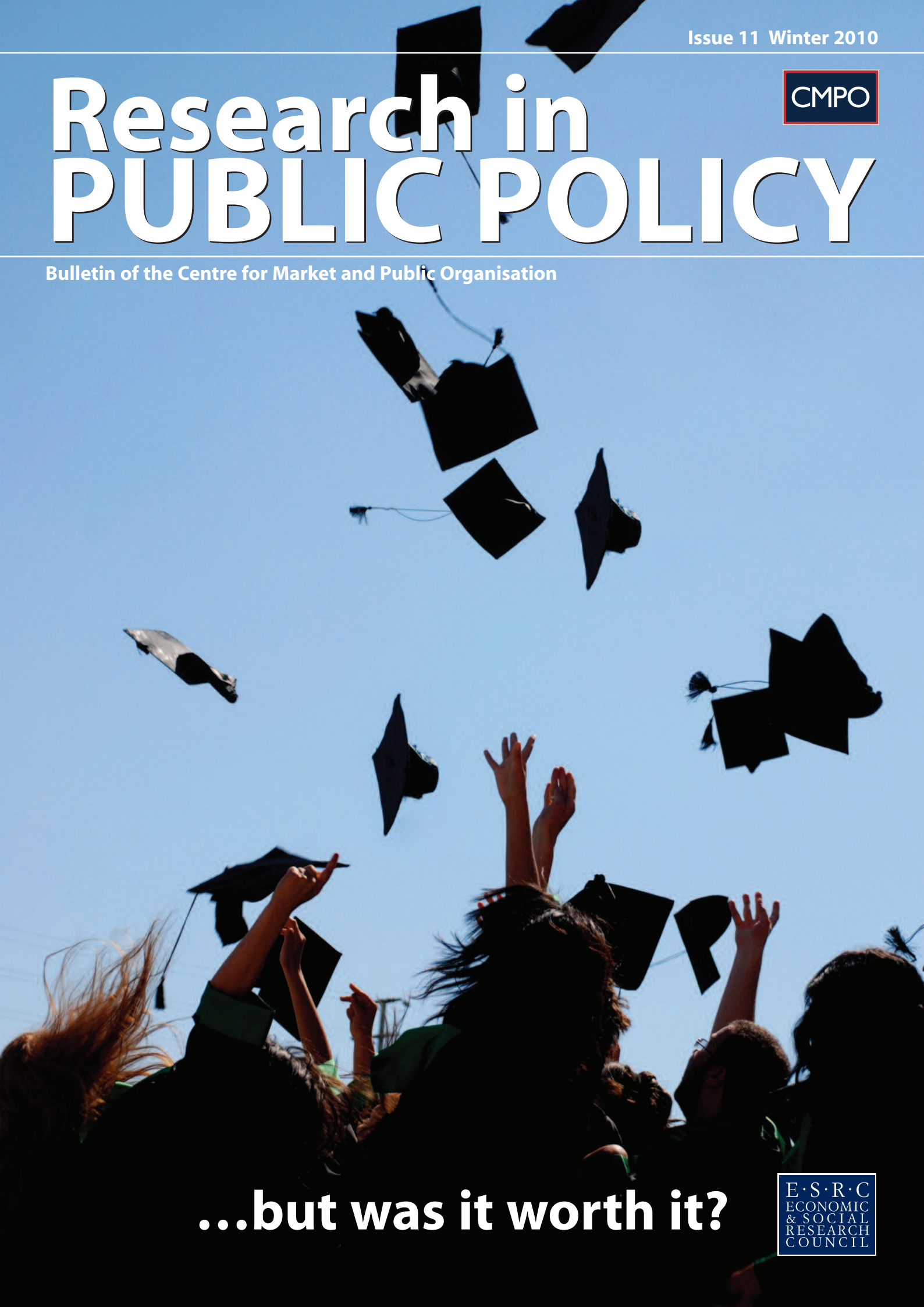

...but was it worth it?

E·S·R·C ECONOMIC & SOCIAL RESEARCH COUNCIL

Bulletin of the Centre for Market and Public Organisation

Editorial

Winter 2010

It is a time of great change for post-16 education in the UK. The school leaving age is due to be raised to 17 by 2013 and to 18 by 2015. At the same time, the government has scrapped the education maintenance allowance, which provided funding for pupils at ages 16 and 17. And higher tuition fees are likely to be introduced by most universities from 2012. These changes make it more important than ever – for individuals and for policy-makers – to have a clear view of the economic benefits of education.

This issue of *Research in Public Policy* features articles from a recent CMPO conference on the returns to secondary and higher education in terms of both employment prospects and earnings, together with some of the broader consequences of education for outcomes such as childbearing.

Public services are firmly in the policy spotlight as the coalition government seeks to introduce reforms in a time of fiscal belt-tightening. Paul Gregg assesses government proposals for the introduction of a 'universal credit', aimed at replacing a range of welfare benefits and tax credits. Carol Propper discusses research on hospital competition, which finds that increased choice and competition under fixed prices can lead to better outcomes for patients. And Jane Waldfogel looks back at the performance of the Labour government in delivering on its commitment to reducing child poverty.

And finally, new research from CMPO explores the issue of whether house prices – the obsession of newspapers and middle class dinner parties – really do have any effect on our happiness and wellbeing.

Helen Simpson and Sarah Smith

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To listen to an audio interview with the author, visit: http://www.bristol.ac.uk/cmpo/audio/

The economic returns to education

In September 2010 CMPO held a conference on the economic returns to education. The research findings presented at the conference are summarised in the series of articles that follows. The topic is extremely relevant to current policy as a number of big changes to post-16 education come into force over the next few years – the raising of the school leaving age from its current level of 16 to to 17 by 2013 and to 18 by 2015; the abolition of the education maintenance allowance, which paid money to pupils from low-income families who remained in education beyond age 16; and the removal of the cap on tuition fees from 2012.

In the UK, as in other Western nations, individuals who acquire more education and training are on average more likely to be participating in the labour market, more likely to be in employment and are paid higher wages. But comparing people with different levels of education may not give a truly accurate reflection of the returns to education. People who acquire more education are also likely to have characteristics – such as natural ability, determination, high expectations, patience and risk-aversion – that independently affect *inter alia* their economic participation, their chances of gaining and retaining employment, the wage they can command and their health and family status.

Hence it is difficult to know the extent to which increasing an individual's education directly affects these various outcomes, as discussed in the articles by Paul Devereux and Robert Hart and by Matt Dickson and Sarah Smith. But it is absolutely crucial to know these causal effects to assess whether young people will benefit from staying on in education. Another possibility is that education acts as a signal of ability for employers, an idea explored in the article by Damon Clark.

Following Lord Browne's Review of higher education funding, universities are to be allowed to raise their tuition fees from the current level of £3,290 to £6,000 or even £9,000. In his article, Ian Walker discusses evidence on the returns to different degree subjects – a key piece of information for potential students assessing the costs and benefits of pursuing a degree. As well as the economic returns – better employment prospects and higher wages – education has also been linked to wider effects, such as better health and health-promoting habits, as well as a link between higher education and childbearing, as discussed in the final article by Michael Geruso.

More details on CMPO's conference on the economic returns to education are available here: http://www.bris.ac.uk/cmpo/events/2010/education/index.html

Changes in compulsory schooling: the impact on wages

In 1947, the UK's minimum school leaving age was increased from 14 to 15. *Paul Devereux* and *Robert Hart* use this reform to estimate the wage returns to an additional year of education.

The 1944 Education Act announced that the UK's minimum school leaving age would be raised from 14 to 15 within three years, and the actual increase came into effect on 1 April 1947. The reform was accompanied by investment in more teachers, buildings and furniture to accommodate the rapidly increased student numbers and the pupil/teacher ratio remained quite stable. But while the higher minimum age provided an extra year of schooling, very few young people who were affected stayed in school until 16 to take national exams and acquire a credential.

The 1947 increase in the minimum school leaving age raised men's wages but had no noticeable effect on women's wages

The effect of the reform was that individuals born before April 1933 faced a minimum school leaving age of 14 and individuals born from April 1933 onwards faced a minimum age of 15. This had a very large impact on school leaving behaviour: the fraction of young people leaving school before age 15 fell from over 60% for the 1932 cohort to about 10% for the 1934 cohort.

Figures 1 and 2 show the resulting effect on the average age at which people left school. Assuming that other factors that affect adult wages did not also systematically change for the 1933 cohort, we can identify the effects of schooling by comparing adult wages of individuals born just before 1933 to those born during or just after.

We use two datasets: the General Household Survey (GHS) and the New Earnings Survey Panel Dataset (NESPD). The GHS is a continuous national survey of people living in private households, conducted annually by the Office for National Statistics. It started in 1971 and has been carried out continuously since then, except for breaks in 1997-98 when the survey was reviewed and 1999-2000 when it was redeveloped.

We use the 1979-98 GHS surveys in our analysis. The schooling variable we use is the age at which the individual left school. This is appropriate for our purposes as we are estimating the value of an extra year spent at school (as distinct from the value of going to college or doing a PhD).

The NESPD comprises a random sample of all individuals whose National Insurance numbers end in a given pair of digits. Each year a questionnaire is directed to employers, who complete it on the basis of payroll records for relevant employees. The questions relate to a specific week in April. Since the same individuals are in the sample each year, the NESPD is a panel dataset and our extract runs from 1975 to 2001. Because National Insurance numbers are issued to all individuals who reach the minimum school leaving age, the sampling frame of the survey is a random sample of the labour force.

Employers are legally required to complete the survey questionnaire so the response rate is very high. Since the data are taken directly from the employer's payroll records, the earnings and hours information in the NESPD are considered to be very accurate. While the earnings data in the NESPD are probably superior to those in the GHS, the NESPD has no information on education. For this reason, we use both datasets in our analysis.

Figures 3 to 6 plot average hourly earnings for men and women (when aged between 28 and 64) by year of birth. For men, there is a clear break in the series in 1933. Quantitatively, the effect for men is that cohorts born in 1933 or later have hourly wages that are about 2% higher than previous cohorts. For women, it is equally clear that there is no break in the series in 1933. Reassuringly, the findings are similar in both datasets.

We can infer from these pictures that the change in the minimum school leaving age increased men's wages but had no noticeable effect on women's wages. But to calculate the implied return to an extra year of schooling,

Figure 1: Average school leaving age by year of birth for women (GHS)

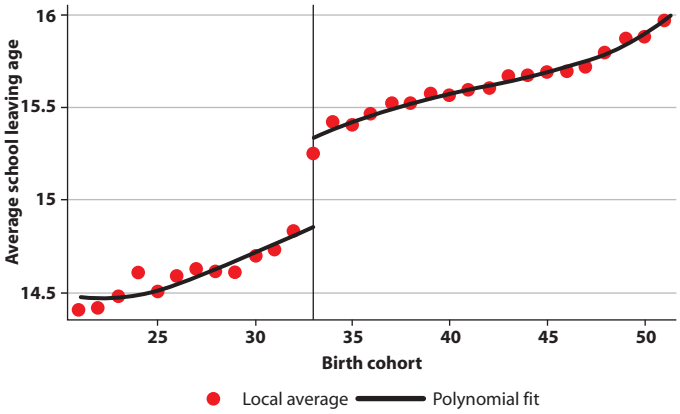


Figure 2: Average school leaving age by year of birth for men (GHS)

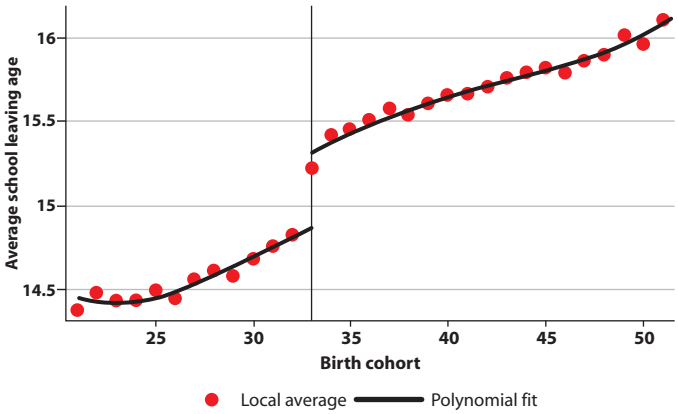


Figure 3: Average hourly wage by year of birth for women (GHS)

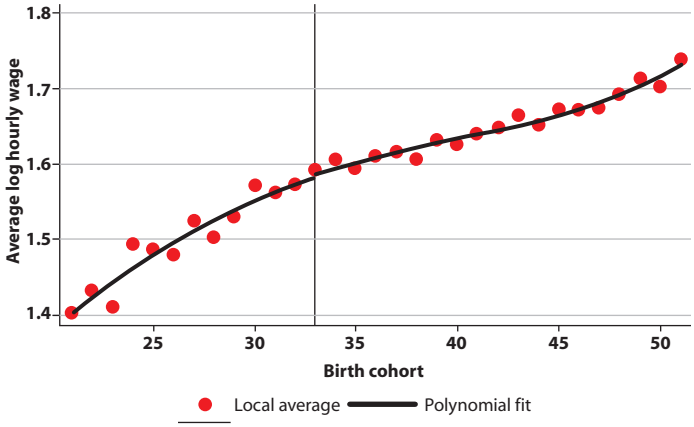


Figure 4: Average hourly wage by year of birth for men (GHS)

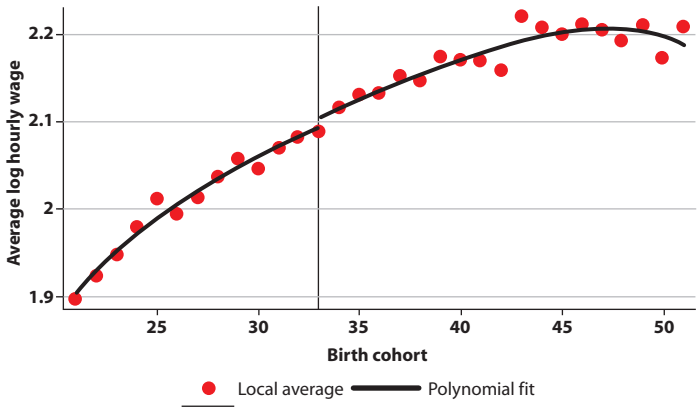


Figure 5: Average hourly wage by year of birth for women (NESPD)

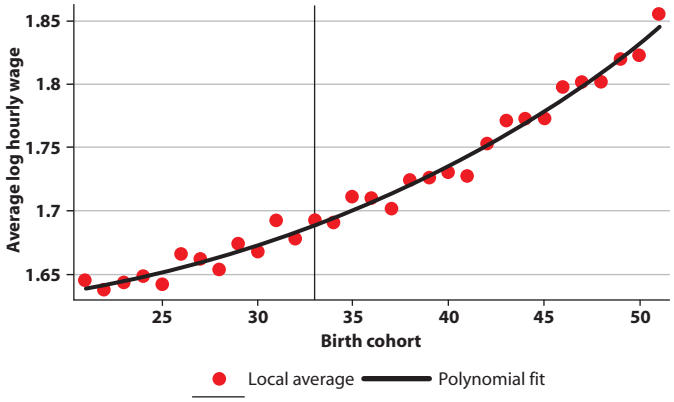
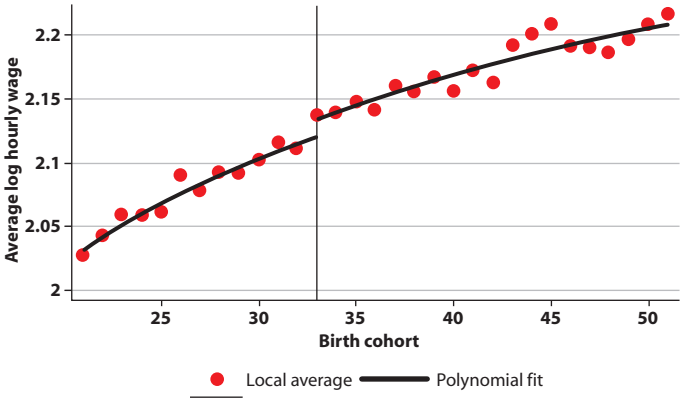


Figure 6: Average hourly wage by year of birth for men (NESPD)



we have to take account of both the increase in schooling caused by the reform and the accompanying increase in wages. When we do this, we find that the return to an additional year of schooling is about 5% for men and zero for women (using wage data from the GHS or the NESPD).

Our findings are generally consistent with recent evidence on the effect of compulsory schooling laws in Europe. For example, researchers have found that similar changes in France and Germany have had zero or low effects on wages. But it is still perhaps surprising that we find that women gained no benefit (at least in terms of wages) from the extra schooling received.

proportion of people who held qualifications such as O-levels. We have tested this empirically and find no evidence of any effect of the reform on the probability of holding an academic credential.

Using compulsory schooling law changes, researchers have generally found higher returns to schooling in the United States. One possible reason is heterogeneous returns to schooling. Very few people actually had to change their behaviour as a result of US changes in compulsory schooling.

The UK's 1947 change in the compulsory schooling law enables us to estimate the returns to extra schooling for men and

The return to an additional year of schooling is about 5% for men and zero for women

A key element in determining the returns to compulsory schooling is the extent to which more restrictive laws result in increased qualifications. Because the 1947 reform only induced participation until age 15, it would not have been expected to increase the

women in a situation where about half the population leave school at the earliest possible age. Hence, the differing results between the United States and the UK could arise if the returns to schooling differ across the education distribution.

Our estimates may also help explain why half the UK population dropped out of school as early as they could. One simple explanation is that the returns to additional schooling were actually quite low for this group and it was rational to leave school early. While it is difficult to quantify the costs of an extra year of schooling, this story is certainly consistent with our results for women.

This article summarises 'Forced to be Rich? Returns to Compulsory Schooling in Britain' by Paul Devereux and Robert Hart, published in the December 2010 issue of the *Economic Journal*. Devereux gratefully acknowledges financial support from the Irish Research Council for the Humanities and Social Sciences.

Paul Devereux is Professor of Economics at University College Dublin. Robert Hart is Professor of Economics at Stirling University.

An extra year or a hurdle cleared: what determines the returns to education?

Will simply compelling young people to stay in school longer improve their labour market outcomes or do they also need to get better qualifications? CMPO researchers *Matt Dickson* and *Sarah Smith* investigate by looking at the UK's 1973 raising of the minimum school leaving age from 15 to 16.

Estimates of the returns to education often combine two things. The estimated return picks up the effect of having received a higher level of education, which in principle should lead to people having greater skills and means they can command a higher wage. It can also pick up the effect of having a higher level of qualifications since people who stay in school longer typically have higher qualifications.

Increasing years of education has the greatest impact on later life outcomes when combined with additional qualifications

Of course, qualifications in part reflect an individual's level of skill but they also play a separate 'signalling' role – letting employers know that someone is likely to be relatively more skilled. Two people both leaving school at the same age with the same skills may command different wages if one has qualifications.

Trying to unpick these two factors is important. Simply compelling people to stay in school longer – without also ensuring that they get higher qualifications – may have little effect on wages. This is relevant to the proposed increases in the minimum school leaving age. Since many qualifications are taken at age 18, making people stay in school to 17 will not have the expected positive effect on wages and participation if it is qualifications that matter.

Mechanics

What we would like to know is both the effect of increasing education by one year and the effect of gaining some qualifications compared with none (conditional on the length of schooling). CMPO research has tried to shed light on this issue.

Calculating the economic returns to qualifications is hampered by the same problems as calculating the returns to a year of education – individuals who gain qualifications are likely to have other characteristics that improve their outcomes, distorting the causal link between qualifications and economic outcomes. To get round this, we exploit an institutional rule that affected when minimum age leavers could finish school.

Between the Education Acts of 1962 and 1996, individuals born between 1 September and 31 January could leave school at the start of the Easter holidays in the academic year that they reached the minimum leaving age.

Those born between 1 February and 31 August had to remain until the last week of May. Having to return after Easter made it more likely that these younger people within the year would stay and actually take exams at the end of that year – which are typically held in May and June. Those leaving at Easter were less likely to return and take the exams.

This should only be important in the period after the 1973 Raising of the School Leaving Age (RoSLA) from 15 to 16 because the higher leaving age brought students to the point where the end of year exams were the nationally recognised O-level and CSE exams. Before the RoSLA, minimum age leavers compelled to come back to school for a few weeks after Easter would not increase the probability of taking these national exams as they were still a whole year away.

If the only difference between these groups is that because of their birth dates, one group stays post-Easter and takes exams and gains some qualifications while the other group does not, we can use this variation in qualification holding to estimate the effect of qualifications on various outcomes.

The figure shows the Easter leaving rule in action, concentrating on those born in the six months around the 31 January cut-off point, to mitigate any effect of age within year on the probability of gaining a qualification. For birth cohorts affected by the 1973 RoSLA (those born from September 1957 onwards) among those leaving at age 16 or less, the younger men in the year have a significantly higher probability of attaining qualifications than the older men. As expected, before the RoSLA there is no statistical difference according to Easter leaving eligibility.

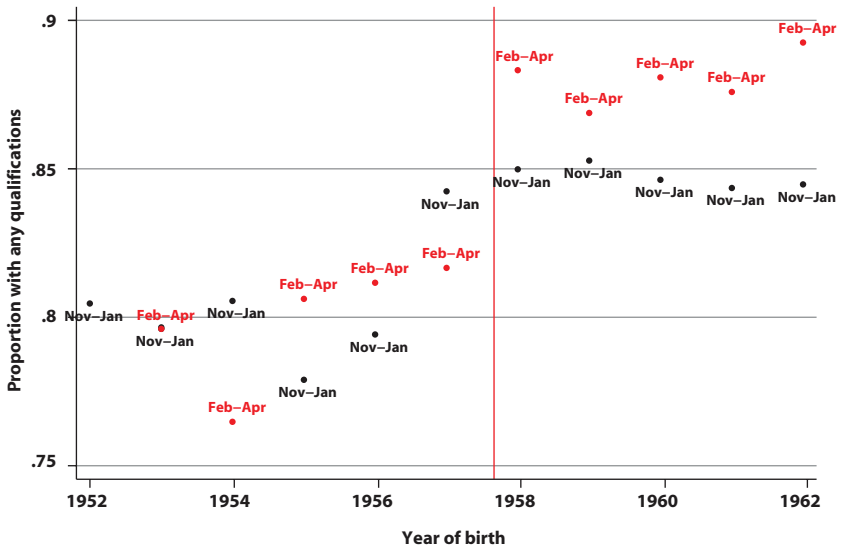
Results

To look at the effect of the Easter leaving rule on qualifications and the effect of these qualifications on outcomes, it makes sense to narrow the focus to the cohorts immediately after the 1973 RoSLA as this is where the greatest effect should be. As the figure illustrates, following the RoSLA, the Easter leaving rule meant that those born from February onwards had a significantly higher probability of gaining any qualifications compared with others leaving at the minimum age who were older within the year and allowed to leave at Easter.

Compared with those born before 1 February, these later leavers also had higher wages by 0.2% and a 0.8 percentage point higher probability of both participating in the labour market and being in work.

The returns for these men at the margin of gaining qualifications are not observed in later wages though they are for participation and employment. The effect of remaining beyond Easter on the probability of gaining any qualifications is an increase of 2.7 percentage points. Given the 0.8 percentage point effect on participation and employment probabilities, this implies a

Probability of men gaining a qualification by birth month and year



Quarterly Labour Force Survey 1992-2007

Two people both leaving school at the same age with the same skills may command different wages if one has qualifications

return to qualifications of approximately 30 percentage points for participation and employment. This estimate captures the effect of qualifications on outcomes, for those induced to attain qualifications because they had to remain in school beyond Easter.

What about the effect of gaining a whole additional year of education for those cohorts born just before and just after the 1973 RoSLA? The results here suggest that among only those who left at 16 or earlier – that is, those for whom the change in minimum leaving age was binding – the additional year of education increased hourly earnings by around 5%, though the difference is not statistically significant.

Similarly, the additional year of education increased the probability of later participating in the labour market by two percentage points though again the difference with those who did not have the extra year is not quite significant. But those who gained the additional year were three percentage points more likely to be in employment than those without and this is statistically significant.

We have seen that raising the school leaving age affected not just the number of years of schooling attained but also the probability of attaining qualifications. The figure illustrates both the Easter leaving rule effect and, comparing either side of the RoSLA, we can see the general upward shift in the probability of gaining qualifications that the RoSLA brought. The question is whether the effects of the extra year only really applied to those who also gained an additional qualification.

Concentrating on employment and participation, where the effect of qualifications is more significant, we look at whether the RoSLA effect on qualifications was different for those allowed to leave at Easter and those who had to stay longer.

Before the RoSLA, those born after 31 January who must remain longer in school before leaving at the minimum age had no difference in the probability of gaining qualifications than those born before 31 January. But while among minimum age leavers, the RoSLA increased the probability of gaining qualifications by three percentage points for those born before 31 January, those born after increased their probability of gaining qualifications by five percentage points.

Making people stay in school to 17 will not have the expected positive effect on wages and participation if it is qualifications that matter

Comparing those in the five cohorts just before the RoSLA and the first five cohorts born after, the impact of gaining qualifications because of the RoSLA, coupled with the Easter leaving rule, is to raise the probability of being in work by 16 percentage points (though not a statistically significant effect) and raise the probability of participating in the labour market by 24 percentage points (which is a statistically significant effect).

It seems from these results that the raising of the school leaving age in 1973 worked through its effect on qualifications – and that this is being driven in the main by those born later in the year who were compelled to remain in school after Easter.

Policy implications

Our results have implications for current policy in light of the Education and Skills Act 2008, which provides for an increase in the minimum age at which individuals can leave education – to 17 in 2013 and 18 by 2015. Increasing the years of education of young people seems to have the greatest impact on later economic outcomes where it is combined with the attainment of additional qualifications – rather than just being an additional year of schooling that is not recognised within the credentials system.

Matt Dickson is a CMPO Research Associate. Sarah Smith is Professor of Economics at Bristol University.

School qualifications: a signal of ability to employers?

Does education increase productivity or just signal it to the labour market? *Damon Clark* provides new evidence in an analysis of the 'signalling value' of a US high school diploma.

One of the most important questions in labour economics is the extent to which additional time spent in education increases one's earnings power in later life. This is partly because these private returns to education are often seen as a good guide to the social returns to education – the benefit side of the cost-benefit calculations that inform government decisions about investments in public education.

Studies typically find that an extra year of education is, on average, associated with a roughly 10% increase in earnings. If these estimates are accurate, they suggest that from the individual's perspective, investments in education can have large effects on earning power. They also suggest that from the government's perspective, public investments that allow people to acquire more education might be cost-effective.

There are, however, two reasons why the 10% estimates might overstate the social returns to education. First, these estimates typically measure the correlation between education and earnings, not necessarily the causal effect of education on earnings. The correlation will overstate the causal effect if it reflects, in part, underlying differences between the types of people that acquire different levels of education – for example, if more able people acquire more education.

Second, even if the private return to education is 10%, the social return will be lower if part of the private return is due to the 'signalling value' of education.

The first of these reasons – ability biases – is easily understood. The second – education-based signalling – is more subtle. The idea, associated with Spence (1973), is that firms are likely to have incomplete information about worker productivity, and hence will base productivity expectations and thus wages on signals of productivity such as education. In other words, firms will pay higher wages to more educated workers because they think that education makes people more productive regardless of their underlying ability and because they assume that more educated people have higher underlying ability.

Both factors contribute to the private return to education. That is because people considering whether to acquire more education care only whether education raises earnings not why it raises earnings. But only the first factor – the productivity-enhancing effects of education – contributes to the social returns to education. That is because, from society's perspective, there is a zero-sum aspect to firms' ability perceptions: firms know that underlying ability is not affected by education investments, and hence they cannot revise up their opinion of one worker without revising down their opinion of another.

Having a US high school diploma sends only a weak signal of an individual's productivity to potential employers

In response to concerns about ability bias, recent studies have estimated the effects on earnings of education investments that are, effectively, forced on people – for example, education acquired because of changes in compulsory schooling. This idea is explained in more detail in the two previous articles. Based on such studies, Card (1999) concludes that the 10% estimate might, if anything, understate the true private return to schooling, a reading with which most labour economists would agree.

There is less agreement among labour economists as to whether education acts as a signal of underlying ability. This issue has been approached from many angles. One of the most popular approaches focuses on the signalling value of educational credentials (as opposed to the signalling value of other dimensions of education, such as years spent in school or type of school attended).

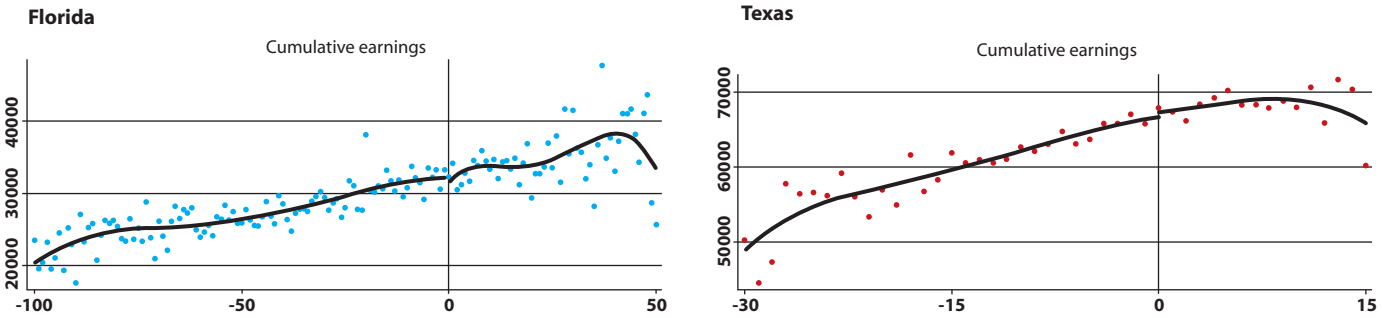
There are two reasons for the focus on credentials. First, it has long been thought that a credential might send an especially strong productivity signal. That is because a credential is usually associated with meeting some standard (for example, passing exams), not just spending time in education.

Second, because a credential is, ultimately, a piece of paper, it cannot have a direct impact on productivity. In principle then, one could estimate the signalling value of a credential by randomly assigning credentials among a small group of workers and then estimating the wage return to holding the credential. Since the random assignment should ensure that workers in the two groups are equally productive, the wage return should capture the signalling value of the credential.

In a recent study, Paco Martorell and I use this idea to estimate the signalling value of a US high school diploma. In some states, including Florida and Texas, the focus of our research, students receive a high school diploma if they remain in school until the end of twelfth grade (roughly aged 18), acquire a certain number of course credits and pass 'high school exit exams' – standardised tests in maths, reading and (in Texas) writing.

We focus on this testing requirement and compare the earnings of students that narrowly passed the tests (and obtained a diploma) and students that narrowly failed the tests (and did not). Assuming that the two groups are, on average, equally productive, any earnings premium enjoyed by those that passed can be interpreted as the signalling value of the diploma.

Our main result is that this earnings premium is, at best, small. This implies that a US high school diploma sends only a weak productivity signal. The figure above illustrates the result, charting total earnings of students who take the exam at the end of twelfth grade in the six years after high school against the minimum score on these tests. We focus on these students, who have failed at least one administration of the



tests (which is taken for the first time in the spring of tenth grade) because, for them, the outcomes exert an especially strong influence on whether they obtain a high school diploma.

There are three features of the figure worth noting. First, earnings in this period are relatively low, less than $10,000 per year in 2000 dollars. That is because many of these people are recorded as having zero earnings, in many cases because they are still in full-time education in college.

Second, there is a strong positive relationship between earnings and the minimum score. This is not surprising: we expect higher-scoring students to be more productive and to perform better in the labour market.

Third, there is no obvious jump in earnings as these scores move through the passing threshold (represented by the line at zero). This contrasts with what we would see if diploma receipt sent a strong productivity signal: a large jump in earnings at this threshold.

After using various methods to estimate the size of the jump, we conclude that it is around $200 in both Florida and Texas. We rule out jumps bigger than $3,000 in Florida and $5,000 in Texas. Since the probability of earning a high school diploma does not jump from zero to one as the score moves through this threshold (because there are some exemptions for those that fail and because those that pass must meet other requirements), this is not our final estimate of the signalling value of a diploma.

Instead, we obtain our final estimate by scaling up these numbers by our estimate of the impact of passing the tests on the probability of obtaining a diploma (around 0.5) and then combining estimates from Florida and Texas (to increase the precision of our estimates). This final estimate, expressed as a percentage of the average earnings of this group is within 1% of zero; we can rule out effects bigger than around 7%.

These estimates raise two questions. First, why might the signalling value of a diploma be so low? Second, why are our estimates so much smaller than those produced in previous research (which are in the range of 10-20%)?

We think our estimates are smaller because previous studies were not able to control fully for the productivity differences between workers with and without diplomas. In other words, previous estimates of the signalling value of a diploma conflated the true signalling value with some of the productivity differences between workers with and without a diploma seen in the figure.

Indeed, when we adopt the approach taken in the previous research literature and compare the earnings of workers with and without a diploma after controlling for worker characteristics such as sex and race, we also obtain estimates in this range.

It is harder to say why the diploma sends such a weak productivity signal. One possibility is that firms have many other sources of productivity information, so that they do not need education information to help predict productivity. Another is that workers misreport diploma status (they lie about their credentials) and that firms (sensibly) discount this information. A third is that firms observe the actual exit exam scores, so that diploma information (whether or not the score exceeded some threshold) is redundant.

We find the third explanation implausible. These scores are printed on high school transcripts, but the evidence suggests that firms rarely ask for them. Instead, we suspect that our results can be explained by a combination of the first two factors. It seems reasonable to suppose that firms have a lot of productivity information. At the point of hiring, this could be obtained from resumes, letters of recommendation and, especially, interviews and performance tests. What firms do not observe at the point of hiring, they may observe shortly afterwards.

It also seems reasonable to suppose that there is widespread misreporting of diploma status. This is partly because diploma receipt is hard to verify. A firm wishing to verify diploma receipt would have to contact a worker's school; and the school is under no legal obligation to respond.

Since similar considerations are likely to apply to other types of lower-level education, our findings suggest that among workers without a college degree, the signalling value of education may be lower than was previously thought. It is not clear whether our results apply to workers with a college degree. For them, indicators of educational attainment (such as class of degree) may be better predictors of productivity than the type of information revealed in job interviews. These types of education may also be easier to verify.

Ultimately though, it is exactly these lower levels of education that labour economists think generate the largest private returns to education (Card, 1999). Our research suggests that signalling factors are unlikely to drive a large wedge between these private returns and the social returns to this kind of education.

Damon Clark is Assistant Professor at the University of Florida and visiting Assistant Professor at Princeton University.

Further reading

David Card (1999) 'The Causal Effect of Education on Earnings', in *Handbook of Labour Economics* Volume 3A edited by Orley Ashenfelter and David Card, Elsevier.

Paco Martorell and Damon Clark (2010) 'The Signaling Value of a High School Diploma', Princeton University Industrial Relations Section Working Paper No. 557 (http://www.irs.princeton.edu/pubs/pdfs/557.pdf).

Michael Spence (1973) 'Job Market Signaling', *Quarterly Journal of Economics* 83: 355-79.

With higher tuition fees imminent, potential students will more than ever need to assess the costs and benefits of pursuing a degree. *Ian Walker* presents evidence on the returns to different degree subjects.

Differences by degree: the returns to higher education

For many years a favourite activity for labour economists has been to investigate the relationship between earnings, education and experience. The popularity of this exercise is due to its importance for policy – the exercise tells us, in principle, how good an investment education is.

Over the years, increasingly large datasets have been used – and more and more sophisticated statistical methods have been adopted. These are mostly to deal with 'ability bias', which arises because we cannot control for all the things that affect earnings and some of them (such as ability) are correlated with education – so the education effect gets inflated because it captures the effect of ability as well.

Strangely, however, very little attention has been given to the *shape* of the relationship between these variables. The dominant assumptions are that: log earnings are a quadratic function of experience; higher levels of education simply shift this relationship upwards; experience (which is not usually measured in the data) can be proxied by age; the effect of age and experience on earnings is not contaminated by cohort differences in earnings; and, in the context of higher education, that the size of this parallel shift is the same for all degree subjects.

Wage growth for graduates is stronger than for non-graduates but with significant differences across degree subjects

In two recent papers I have co-authored, these assumptions are challenged and all found to be wanting (except the quadratic shape which turns out to be a fairly good description). These are not (just) statistical niceties – they matter for important policy issues if we find that they are not good representations of the observed data.

So here are some observed data: Figures 1a and 1b show the relationship between age and log earnings in Labour Force Survey (LFS) data of graduates and those with at least two A-levels (who could, in principle, attend university and act as our control group). The data are pooled over as many years of LFS data as possible. The size of the dataset allows us to slice it by gender and by degree subject.

The darkest line is the group with at least two A-levels – and it is clear that the absolute gap between this and the other lines (for each

Figure 1a: Smoothed local regression estimates of age-log earnings profiles: men

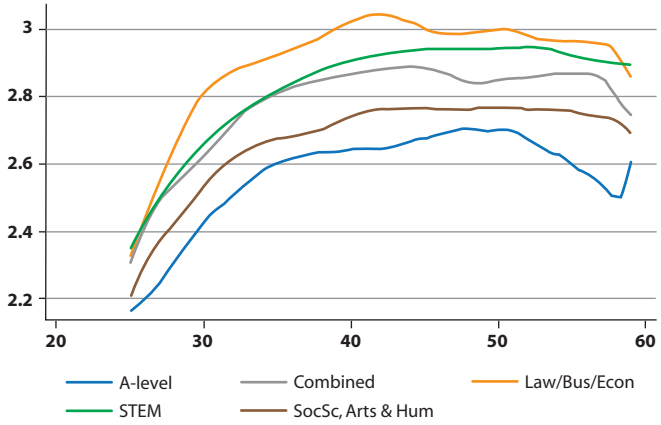


Figure 1b: Smoothed local regression estimates of age-log earnings profiles: women

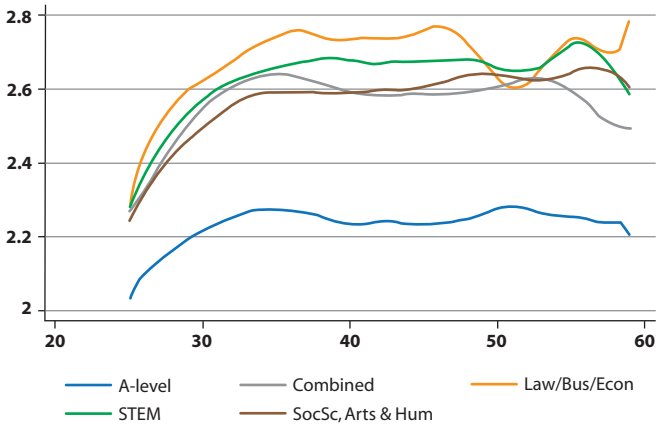


Figure 2a: Estimated age-log earnings profiles by subject (2II for graduates): men

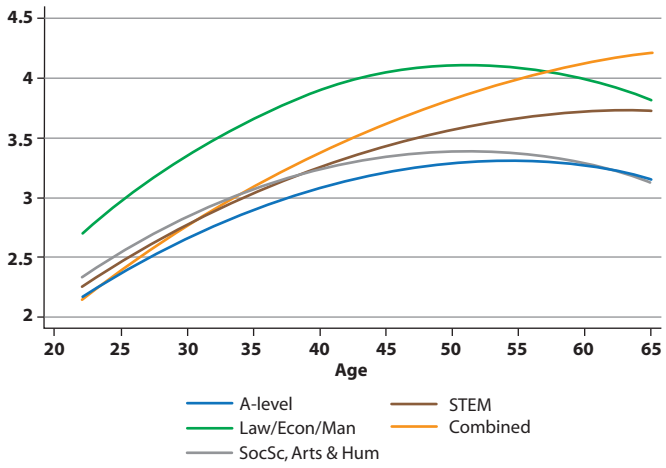
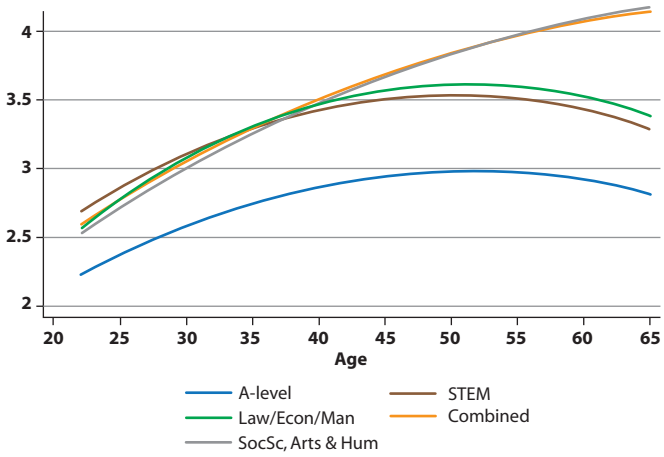


Figure 2b: Estimated age-log earnings profiles by subject (2II for graduates): women



broad degree subject group) gets bigger with age. In general, graduates earn more and more compared with the control group as they get older – though with Arts, Humanities and Social Sciences (excluding Economics, which we group with Law and Management into 'LEM'), it is not so clear.

There is a problem with Figure 1b: for women age is not a good proxy for experience, which is why the lines are flatter than for men. So this is not a good guide to what might happen to women's earnings looking forward because young women now are different to young women born 40, 30 or even 20 years ago in their attachment to the labour market. In other words, there are likely to be very strong cohort effects in these data.

Fortunately, we have data on how earnings grow over a year for those in work at the beginning and end (which we can look at separately by birth cohort), which give us a much better idea of how earnings are likely to grow for young women now and as they get older. For the young cohort, the picture (in Figures 2a and 2b, where we have imposed the quadratic assumption) looks much more like men: there is stronger wage growth for graduates than non-graduates but with differences across degree subjects.

The gap between graduates and non-graduates is large for women, and for most men – the exception being Arts, Humanities and Social Sciences, where the difference for men is small and gets smaller with age. For men we find that LEM delivers very fast earnings growth early in life and only those with combined degrees catch up – and even then only close to retirement.

So graduates earn more – and some much more – than non-graduates. But to evaluate whether a degree is a good investment we need to factor in the cost (fees, the forgone income while studying and the extra expenses of studying) and we need to remember that earnings are taxed and that tax is progressive.

For example, assuming that tuition fees are at their current levels (£3,290 a year), we find that lifetime net income for men is doubled with a good LEM degree but a combined degree offers only half that, while a STEM degree only offers about one quarter of that. A higher class degree gets quite a lot more than a lower class degree – across all subjects.

Studying law, economics or management delivers very fast earnings growth for men early in their careers

Putting all these factors into the pot, we can simulate earnings net of fees, tax and other costs across the lifecycle, taking on board the loans and grants that are on offer, and calculate the rate of return that would yield an equivalent level of lifetime income – the 'internal rate of return' (IRR). The average IRR for a good (2.1 or better) LEM degree for men is 28%, while for a good STEM degree it is only 7%. Women do very well across the board – in all subjects the IRR is close to 17%.

The focal point for fees in the Browne report is £6,000. Redoing the arithmetic using the Browne proposals (with a higher interest rate, bigger threshold, etc.) suggests that students from a low income background are getting 29.8% on their pound invested in LEM (they get a slightly better deal than students from a higher income background who earn 29%) and under Browne they will be making 29.2% (28.6%).

The overwhelming conclusion is that higher fees would not have made much difference – the dominant determinant of the returns to your investment is the subject you study and how hard you study it. This will still be true under the Browne proposals, which reduce returns but not by very much.

Ian Walker is Professor of Economics at Lancaster University.

Further reading

Giuseppe Migali and Ian Walker (2010) 'Estimates of the Causal Effects of Education on Earnings over the Lifecycle with Cohort Effects and Endogenous Education', mimeo, Lancaster University.

Ian Walker and Yu Zhu (2010) 'Differences by Degree: Evidence on the Net Financial Rates of Return to Undergraduate Study for England and Wales', IZA Discussion Paper No. 5254.

Education and childbearing: what are the links?

The minimum age at which teenagers in England can leave education will rise from 16 to 17 in 2013 and then to 18 in 2015. *Michael Geruso* explores whether the young women who spend longer in school as a result might be more likely to postpone motherhood.

It is a remarkably robust fact of the modern world that within any time and place, women who have attained higher levels of education tend to have fewer children and to postpone childbearing until later in their lives. What is less well understood is whether this correlation is causal.

Women who are more highly educated have lower fertility rates early in life and higher fertility rates later in life

If higher educational attainment causes lower fertility, then policies that promote education can be viewed in light of their likely consequences for childbearing. The impacts on fertility are particularly relevant to long-term planning for the fiscal solvency of social welfare programmes, many of which are sensitive to the age structure of the population and the ratio of working-age people to retired people.

There are many plausible explanations for the association between education and fertility. Beginning with Gary Becker's work in the 1960s, economists have tended to think of wages as one of the primary mechanisms linking education to fertility. Because a higher level of educational attainment endows workers with higher earnings potential, the value of a woman's time, which could potentially be spent in the labour force, increases with her level of education.

This higher implicit value of time makes childbearing and childrearing, which are time-intensive processes, relatively more costly in terms of forgone earnings, compared with women with less education. As a result, the theory goes, women of higher educational attainment may substitute away from having large numbers of children, in favour of investing more financial resources into a fewer number of children or of substituting toward the enjoyment of other types of goods altogether.

Of course, a sensible alternative explanation is that the correlation between education and fertility merely reflects differences in underlying preferences, and that we observe a spurious association between educational attainment and fertility decisions that is not caused by education. In other words, some third factor might drive both a woman's educational choices and her fertility decisions. Family background is an obvious candidate.

In a recent study, I explore the relationship between education and fertility patterns using data from the National Child Development Study (NCDS) with the aim of establishing what part of the observed education-fertility relationship, if any, is causal.

The NCDS is a panel study that has followed a cohort of children born in the UK during one week in March 1958 from childhood to adulthood and on through their own childbearing years. Data are reported from interviews with the cohort members themselves, as well as interviews with their parents and representatives from their schools (during their early years). Importantly, substantial information on family background at various ages is recorded.

Figures 1 and 2 show the basic relationship between education and fertility, in the absence of any controls for family background. Figure 1 displays, for female respondents, the average cumulative number of children born by each age. Separate curves are drawn according to the age at which the woman left full-time education.

A strong relationship between years of education and fertility is apparent, with women of lower educational attainment having children sooner, on average, and ending their childbearing years with a greater number of children.

What is not obvious from Figure 1 is that by the age of 30, patterns of fertility reverse, with more highly educated women having more children at each age. These time-patterns of births are shown more clearly in Figure 2, which displays the age-specific, rather than cumulative, fertility rates: at each age, it shows the average number of children born to women of that age.

Women of higher educational attainment have lower fertility rates early in life and then higher fertility rates later in life, though the magnitude of the reversal is not strong enough to change the ordering of educational groups in terms of cumulative childbearing.

One insight into the causal effect of education on fertility is apparent even from this plot of the raw data: education does not affect fertility

Despite the strong correlation between education and fertility, education seems to have no causal effect on childbearing decisions

Figure 1: Cumulative fertility, by age left education

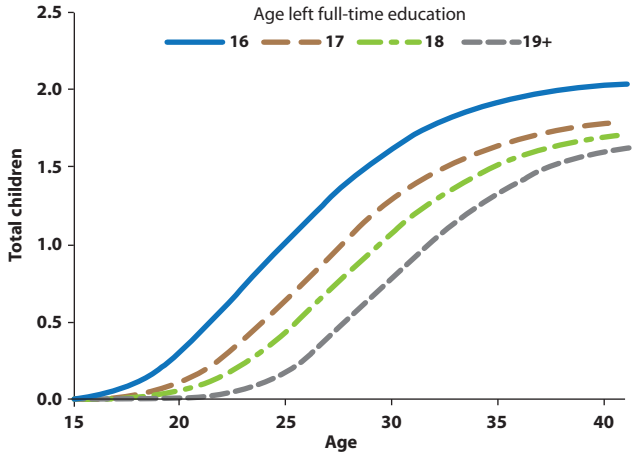
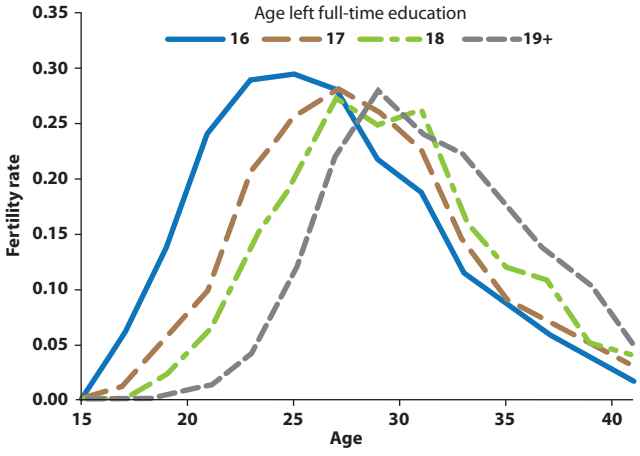


Figure 2: Age-specific fertility, by age left education



merely through an 'incarceration effect', by which fertility is reduced over the period in which a woman is a student. One might expect an incarceration effect simply because a student lacks the opportunity and/or desire to become pregnant while pursuing her education.

Figure 2 shows that the fertility-education correlation remains long after leaving full-time education. Women who left school at age 16 will bear more children between the ages of 20 and 25 on average than women who left at 17, despite full-time education being long since completed for both groups.

Figures 1 and 2 merely confirm for women of the 1958 birth cohort a pattern observed in many other studies: education predicts fertility. But it leaves open the question of whether education causes fertility.

To make headway on that question, I bring the correlations of Figures 1 and 2 into a regression framework and introduce detailed controls for family background, including: mother's and father's education; father's social class; whether parents report financial hardship (at various ages of the child); whether a school reports the child receiving free school meals; religion; number of older and younger siblings; and the cohort member's childhood test scores at various ages. The outcomes I examine are total children ever born and age at first birth, which are intended to capture education's effects on both total fertility and timing.

The results show that controlling for family background and academic ability can account for a significant portion of the education-fertility association. Including the set of controls listed above reduces the estimated effect of education on total children and age at first birth by 30-40%. This result suggests that at least part of the relationship between education and fertility is driven by some third factor, which is either family background or something correlated with family background.

Policies that improve educational attainment will not necessarily lead to reduced fertility or postponed childbearing

To push the analysis further, I use a unique feature of the NCDS data. The NCDS was one of the first cohorts of people to be affected by a 1973 reform that raised the minimum school leaving age from 15 to 16. At age 16, NCDS respondents were asked if they would have left school at age 15 had they been allowed to.

This allows me to analyse a simple question: among women in the NCDS who wished they could have left school at 15 (but who actually left school at 16), do fertility patterns appear more similar to the women prior to the 1973 reform who actually left school at 16 or to the women prior to the 1973 reform who actually left school at 15?

That comparison provides some very stark results. The fertility patterns of women who were forced to leave school at age 16, but who wished to leave school at age 15, are remarkably similar to the fertility patterns of women born just a year earlier who *actually* left school at 15. This implies that an additional year of education had no effect on the fertility choices of the women who were forced to stay in school until age 16. Instead, whatever preferences these women had regarding the size of their families and the timing of their pregnancies were fixed in a way that additional education did not affect.

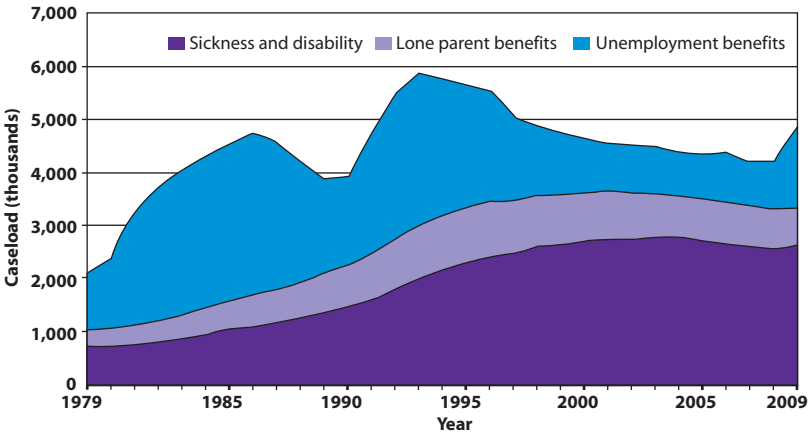
The result that education seems to have had no causal effect on childbearing decisions in this context is somewhat surprising, given the strong overall correlation between education and fertility in the data. Nonetheless, the evidence here indicates that regardless of whatever else we expect to result from policies that improve educational attainment, we should not necessarily expect reduced fertility or postponed childbearing.

Michael Geruso is at Princeton University.

Radical welfare reform

To motivate its proposed reforms to the UK's system of benefits, the coalition government asserts that welfare is broken and spending out of control. *Paul Gregg* assesses these claims in the light of the recent performance of the welfare system, and examines the key issues involved in moving to a 'universal credit'.

Figure 1: Claims for major jobless benefits, 1979-2010



Work and Pensions Secretary Iain Duncan Smith is proposing a 'universal credit' to replace the current range of welfare benefits and tax credits. The central idea is to have a single deduction rate as incomes rise, designed to ensure that people are always better off working and that those on low incomes do not face punitive effective tax rates when they seek to earn more.

Some key facts are used to support his assertions that welfare spending is out of control and the system broken: that there are five million claims for jobless benefits; that the proportion of children growing up in workless families (16%) is the highest in Europe; that spending has risen by 40% in real terms over the last decade; and that 1.7 million families face tax and benefit withdrawal rates of over 70%.

All these facts are true – but do they support the government's view? We have just experienced the worst recession since the Second World War and the welfare system is doing its job of supporting the workless in a downturn. So it is essential to look at how welfare dependence and spending have evolved over time.

Is welfare broken?

Figure 1 shows the numbers of claims for the major workless benefits since 1979. Current claims number five million, up from four million before the recession. But at the end of the last recession, which was milder, claims stood at six million. So the number of welfare claims has actually declined given the state of the economic cycle.

But ideally we would like to separate the cycle from the effectiveness of the welfare system in shaping the numbers reliant on benefits. One approach is to measure how many more households are without work (and normally reliant on benefits) than there would be if work were randomly allocated across the working age population given overall employment levels.

Table 1 shows the rate of household worklessness, the employment rate and the 'excess' of households without work compared with a random allocation. The idea is that if the welfare system provides weak work incentives, then this would show up in growing numbers of workless households.

The random allocation assumption acts as a benchmark of what would be predicted by chance; and the excess workless household rate is a benchmark of trends given family structure and employment levels.

In the 1970s, the actual picture equated closely to the random allocation, so there was no excess of workless households. From then until around 1995, an excess of welfare dependence began to emerge, so that 6.7% (1.2 million) more households were without work – signs of a welfare system that was plausibly 'broken'. Since then the number has fallen to 5% in 2009, which means that since 1995, 350,000 extra households are working.

One sign that this is driven by welfare reform is that the improvement is far greater for lone parents (a key focus of reforms over the last decade) than for other people. Employment among lone parents (given their education levels, etc.) has risen by 11% above that of other groups. So by this measure, welfare reforms since 1996 have unpicked about 30% of the build-up of excessive welfare dependence after 1979.

Table 1: Excess workless household rates (all figures exclude full-time students)

	Workless household rate (%)	Excess workless households (%)	Employment rate (%)
1977	8.2	- 0.2	76.5
1986	16.3	+ 4.9	71.0
1990	13.9	+ 5.0	75.6
1995	19.3	+ 6.7	73.9
1997	18.2	+ 6.5	75.9
2006	16.0	+ 5.2	77.9
2009	17.3	+ 5.0	76.7

Source: Labour Force Survey, author's calculations

Table 2: The effect of government reforms on high marginal deduction rates

Marginal deduction rate	Pre-1998 Budget	Financial year 2010-11	Financial year 2001/12
Over 100%	5,000	0	0
Over 90%	130,000	70,000	130,000
Over 80%	300,000	270,000	330,000
Over 70%	740,000	330,000	1,710,000
Over 60%	760,000	1,895,000	1,935,000

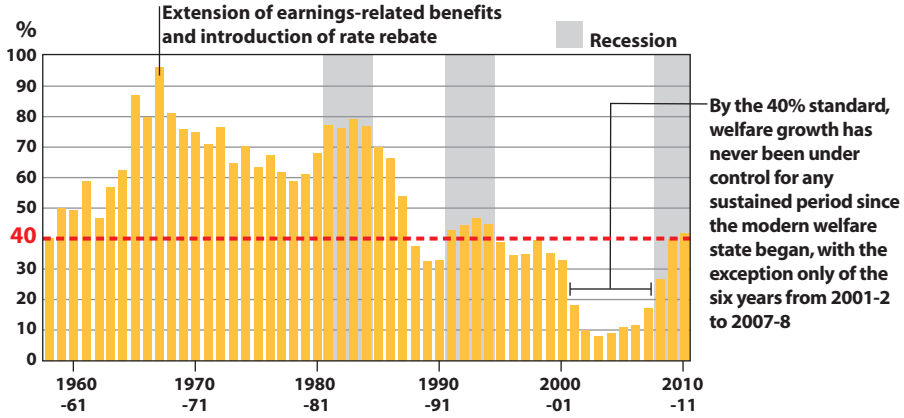
Source: Budget documentation for 2009 and 2010

It is for families with children that excess worklessness has fallen most. The UK still has the highest proportion of children living in families without work in Europe. But in 1997 the figure was 19% in what was a much healthier labour market, and in the early 1990s, it was over 20%. It is a sign of how bad things were in the mid-1990s that steady improvements since 1995 still leave the UK behind.

So in terms of worklessness leading to reliance on welfare, the picture is not of a broken system. Rather it is of a system that has been steadily improving since 1995 but masked by the current recession.

Figure 2: Cost of welfare

Rolling 10-year percentage increase in social security spending in real terms, 2010-11 prices*



*Thus the 1958-9 figure of about 40% indicates 40% growth over 10 years up to 1958-9.
Source: Institute for Fiscal Studies

Is spending out of control?

Figure 2 shows the real increase in annual welfare spending since the 1950s. As the government says, there has been a 40% real increase over the last decade, but the rise was much greater in the 1950s, 60s and 70s. Indeed, apart from the current recession, the growth of welfare spending has slowed rapidly since the mid-1980s, and is less out of control now than at any time since the Second World War.

The deeper point is that it is not the real increase that matters but the rise relative to GDP growth. GDP grew by 25% in the ten years to 2007, so the long-term pattern of welfare spending relative to GDP was falling and had been throughout the new millennium. It is only the recession since 2008 that has pushed long-term growth in spending above that for GDP.

This is not a welfare system where spending is out of control but one that is doing its job in a recession when real spending rises while GDP falls because of increased need for support. This is part of the economy's system of 'automatic stabilisers' to prevent recession turning into a depression, and it will be reversed as growth returns. Indeed, the real rise in spending through this recession is well below that in previous recessions.

Issues with a universal credit

The real picture that emerges for the welfare system is one of long-term declines in numbers of claims and total spending as a share of GDP. So government claims of a broken welfare system and spending out of control simply do not stack up. They are more the hyperbole that politicians use to motivate change rather than a depiction of reality.

The government argues that the system is too complicated and that work incentives are too low because of excessive rates of benefit withdrawal when people earn more. The preferred solution – the universal credit – would take all income-related benefits and tax credits for working age people into a single system with a single withdrawal rate of 65p in the pound as earnings rise.

This withdrawal would have to be based on joint family income. But the universal credit still needs to address the residual entitlements to individual contributory benefits (based on NI contributions made rather than an assessment of family needs), mainly short-term Jobseeker's Allowance (JSA) and incapacity-related benefits.

Keeping these individual elements separate from the family-based universal credit would add considerable complexity, undermining the very logic of the reforms. The government has moved to make contributory access to incapacity-related benefits limited to a year. This saves money but also leads to many people losing entitlement to any financial support.

The remaining individual contributory elements still add substantially to the complexity of the proposed system with two additional benefits outside the credit. Hence the expectation must be that the remaining contributory elements in benefit entitlement will eventually go. There are four additional fundamental design features that will be a problem with moving to a universal credit.

Many benefits are supplements for specific additional costs: Housing Benefit (HB), Council Tax Benefit (CTB), the higher value of benefits for disability than for jobseekers, Disability Living Allowance (DLA) and Attendance Allowance (AA) all reflect payments for additional costs that only apply to some claimants. A single universal credit would not be high enough to meet these additional costs unless it was very generous and thus prohibitively costly.

But keeping them as extra payments requiring additional claims means that the new system would simply replicate the current system but with extra supplements rather than different benefits. It was the addition of supplementary elements in the tax credit system that led to it becoming so complex. This is such a profound problem that it has to be at least partly fudged, and the government has already suggested that CTB, DLA and AA are to stay out of the credit. But for the reform to be meaningful, HB and the higher value benefits for disability would have to be inside.

Keeping these supplements unreformed makes the system complex. But ironing them out entirely so there is a flat rate benefit for all would be prohibitively expensive even with substantial losers. So it is not surprising that the government has ended access to higher value disability benefits when a claim reaches a duration of one year for all those except the most extremely ill or disabled. Even with a one-year limit, this looks clunky and may presage its abolition.

HB is even more difficult. In the private sector people are paid a housing allowance based

on family size and area where they live. Capping this has been at the centre of a major political row recently. In the social rented sector people are paid the benefit on the basis of their actual rent due. Social sector rents are subsidised and thus lower than those in the private sector, but the size of the gap varies considerably around the country and is much larger in the South East. Again it is not surprising that the government is indicating it will set rents at 80% of those in the private sector. This allows for a much simpler system of a housing allowance in the social sector set at 80% of that in the private.

This is the likely direction of travel for a universal credit. But as people in the social sector are paid their actual rent, they will often lose a large amount under this simple rule where they have a large property relative to their family size. For example, a couple with a three bedroom house whose children have left home will now only get an allowance for a one bedroom flat. Many older people would lose from such a change. So it is not surprising that the new system will be for new claims only.

Different elements of the current system are re-evaluated at different intervals: Most benefits are based on current income, rent, etc. and are reassessed whenever there is a change of job, family structure or wages. But tax credits are based on last year's earnings and only reassessed within a year if there is a major change of circumstances. In addition, large income rises are tolerated so that there is no recalculation until the next year; but significant income falls trigger rapid reassessment.

Crudely, it seems sensible for out-of-work benefits to change when people start earning or lose jobs. but instant adjustment every time someone works an extra hour a week or gets a pay rise seems unwieldy. At present this is partially dealt with, though not without problems, by having separate in- and out-of-work systems. How a single credit would navigate this may again make it complex.

Out-of-work benefits come with conditionality: Jobseekers, including lone mothers whose youngest child is 10 or older, are required to show that they are actively applying for jobs and to take work that is offered. They can also lose benefits for leaving a job through choice.

Those with health problems are required to follow an action plan to get them back to work but are not required to look for work on day one and can refuse jobs they do not feel are suitable. Those who are extremely sick or disabled and their carers, plus lone mothers with young children, are not required to undertake any activity. Those who only claim in-work benefits such as HB or tax credits are not subject to any conditionality.

At present, once a family is working 16 hours a week they are left on their own. Under a single credit, deciding the appropriate levels of conditionality and support to look for work need not be based on what benefit someone is on but a broader measure of employment barriers faced. But to extend conditionality to those who already work, especially 16 hours or more a week, could easily create widespread resentment.

The out-of-work welfare system and the in-work tax credit system create sharp incentives to work a minimum number of hours: Tax credits are only paid when people are working at least 16 hours and there are children in the family or a person is disabled, and 30 hours otherwise. The high rate of withdrawal for the major out-of-work benefits when someone starts to earn means that there is no incentive to work fewer than 16 hours a week for families with children, but at 16 hours the gains to work jump substantially.

Almost no family with children is less than £40 a week better off in work after one person is working 16 hours, or for those without children at 30 hours. The system generates gains to work by the use of tax credits but when withdrawn they can lead to high effective tax rates as both income taxes and lower benefits kick in at the same time.

Improving incentives to move into work without cutting benefits means two broad options. One is to pay higher in-work tax credits or withdraw them more slowly. The other is to raise allowances or have a low tax rate at low earnings, such as the 10p tax band.

Table 2 shows marginal combined tax and benefit withdrawal rates. In 1998, 750,000 people faced rates over 70% and a smaller number faced higher rates, some over 100%. Labour's tax credit system reduced numbers on these very high rates: the number with over 70% fell to 330,000 but very large numbers (1.9 million) face rates of 61-70%, most at the top end of that range.

In the recent budgets the withdrawal rate for tax credits was raised, especially for those losing the family element, which was withdrawn at £50,000 and where the taper will to go from 15% to 41%. This means that the number of people facing over 70% marginal tax rates will shoot up next year.

Lowering these high effective tax rates and also increasing the returns to working below 16 hours in a universal credit has major problems. Reducing the withdrawal rate from the normal 70% to 65%, as proposed by the government, only means that it will stretch further up the income distribution. This costs more money and means that even more people are subject to effective tax rates of 65%.

There are three potential solutions. First, the generosity of the universal credit could be much lower than the current system, so less needs to be taken away and, as out-of-work support is lower, work incentives are improved. Second, as the Liberal Democrats have argued, the allowance before income tax is paid could be raised – essentially the same idea as the 10p tax band.

The third route is an income range over which the tax credit is not withdrawn, which is targeted at where most taxpayers are – so part is withdrawn at low earnings where relatively fewer families are, and part from high earners where again there are fewer taxpayers. The last two options are expensive and unlikely to be used in an age of austerity, so more people are likely to be pulled onto 65% effective tax rates.

Radical welfare reform

The universal credit represents a radical administrative change. The simpler the new system is, the more it results in large numbers of losers even with substantial extra costs to the Treasury. The more complex it is, the less radical a reform it represents and the less attractive it becomes. Selling a system with substantial extra costs and many losers will prove difficult. And doing it in one big bang may repeat the administrative nightmare that occurred with the more modest integration of three different sources of support for children with the tax credit system. So perhaps it is not surprising that the government plans to start with only new claims.

Paul Gregg is Professor of Economics at Bristol University.

Britain's war on poverty

What steps did the Labour government take to fulfil its pledge to end child poverty in a generation, how successful were these efforts and what further steps are needed to achieve the goal? In a new book, *Jane Waldfogel*, a leading US researcher on public policy, examines Britain's war on poverty.

In March 1999, Prime Minister Tony Blair made a remarkable pledge – to end child poverty in a generation. Gordon Brown, then Chancellor and later Prime Minister, set a further target of cutting child poverty by half in ten years and committed considerable resources to attaining this goal.

The anti-poverty initiative of the past decade consisted of three strands: a set of measures to promote work and 'make work pay'; increased financial support for families; and a series of investments in children. Here, I review the three strands of the reform effort, summarise what we know about its effects and offer some thoughts about next steps if the coalition government is to continue Britain's war on poverty.

Promoting work and making work pay

The first strand included the New Deal for Lone Parents, a primarily voluntary welfare-to-work scheme launched in 1997. It was not until 2008 that some lone parents – those whose youngest child had reached the age of 12 – were required to work or look for work.

This strand also included measures to make work pay, including the national minimum wage introduced in 1999, tax reductions for low-income workers and their employers, and a new tax credit, the working families tax credit, which was later replaced by the more generous working tax credit.

Together, these reforms were successful in promoting work. Lone-parent employment increased by 12 percentage points – from 45% to 57% – between 1997 and 2008, with at least half of this increase attributable to the reforms. In addition, the incomes families could expect from work also increased.

Increasing financial support for families with children

The second strand of the reforms was a set of measures to raise incomes for families with children, whether or not parents were in work. Child benefit levels were raised substantially starting in 1999, with particularly large increases for families with young children. Income support benefits for families with young children were also raised. The government also introduced a new children's tax credit for low- and middle-income families with children (later replaced by the integrated child tax credit).

> Labour's anti-poverty initiative consisted of measures to promote work and 'make work pay', increased financial support for families and investments in children

Investing in children

Investments in children were the third strand. These were seen as essential to address the 'intergenerational' effects of poverty and reduce the risk of poverty being passed on from one generation to the next.

An extensive set of reforms focused on the early years: the period of paid maternity leave was doubled to nine months; two weeks of paid paternity leave were introduced; universal pre-school for three and four year olds was introduced; childcare assistance for working families was expanded, and legislation was enacted placing a duty on local authorities to provide adequate childcare; parents with young children were given the right to request part-time or flexible working hours; and the Sure Start programme was rolled out for infants and toddlers in the poorest areas.

For school-age children and adolescents, there was a series of measures to improve education. Class sizes were reduced in primary schools, and national literacy and numeracy strategies directed teachers to spend at least an hour a day on reading and an hour on maths. Later efforts focused on improvements

in secondary schools and measures to persuade more young people to stay on at school (including raising the minimum school-leaving age). Test score data showed progress in terms of overall levels of achievement and also narrowing gaps.

Together, these anti-poverty initiatives reflected a very sizeable investment in children, with the additional benefits disproportionately going to the lowest income children. By April 2010, the average family with children was £2,000 a year better off, while families in the bottom fifth of the income distribution were £4,500 a year better off.

The reforms increased family expenditure on items for children and led to improvements in their well-being

The impact on child poverty

When Tony Blair declared war on poverty in 1999, 3.4 million children – one in four – were in poverty, using both the absolute and relative measures of poverty. But trends after 1999 depend on which measure is used.

Absolute poverty (using the official government measure tied to living standards in 1998/99, uprated only for inflation) fell by more than 50% (1.8 million) by 2008/09, while relative poverty (using the official government measure of the poverty line as 60% of average income) fell by 15% (600,000 children).

The two measures tell a different story because the relative measure is affected by changes in the income of the median family. The fact that absolute poverty plummeted, while relative poverty fell less sharply, means that the incomes of families at the bottom rose, but not as fast as the incomes of families in the middle.

Statistics on the third official measure – material deprivation – confirm that there were sharp and sustained decreases in material hardship and financial stress for the most vulnerable families.

Analysis of poverty data for Europe and the United States confirms that these reductions in child poverty were not inevitable but rather the result of government policy. With overall levels of inequality increasing over the period, relative child poverty rates would have risen had the child poverty initiative not been undertaken. Seen from this perspective, the poverty effects, even on the relative measure, are impressive. And there is also evidence that the reforms increased family expenditure on items for children and led to improvements in their well-being.

Making further progress

In thinking about next steps, we must first understand which children are poor and which factors raise the risk of poverty. The demographic data indicate that 55% of poor children live in families in which at least one parent is already working (46% in two-parent families and 9% in one-parent families). A further 29% live in one-parent families where the parent is not working. The remaining 16% live in two-parent families where no parent is working.

There are also some cross-cutting factors, such as parental disability and large family size, which increase the risk of poverty. In addition, child poverty rates are much higher for some ethnic groups, in particular, Pakistani and Bangladeshi families.

These demographics create five challenges that policy-makers must address if they are to make further reductions in child poverty. The first is to do more to raise incomes in working families, through measures such as expanding childcare and other in-work support for those on the lowest incomes, raising the value of the minimum wage, improving incentives to work additional hours and expanding measures to improve the skills and qualifications of low-skilled workers.

The second challenge is to move more lone parents into work. Helpful measures here include expanded childcare supports as well as strengthened child support enforcement.

The third challenge is to address poverty in workless two-parent families. Here, I recommend a personal advising model (along outlines by CMPO's Paul Gregg in his December 2008 review, *Realising Potential: A vision for personalised conditionality and support*), alongside policy measures such as expanded childcare supports.

The fourth challenge is to address the elevated risk of poverty in Pakistani and Bangladeshi families. While some of the factors underlying this have been identified (mothers in these families have low employment rates, fathers' earnings are low, family size tends to be large and there are often non-working extended family members), it is not clear what the policy response should be. So here I recommend more research on the experiences of these families, as well as more local efforts and initiatives.

The fifth challenge is to address underlying trends in income inequality. One important priority must be to continue to work to raise skills at the bottom of the income distribution, to promote more social mobility and to narrow the gap between the bottom and the middle of the income distribution.

Finally, a word about measurement. The experience of the past decade offers some clear lessons. As described above, the government uses three official measures of poverty, and each one has provided useful information. The relative measure tracks trends in inequality, while the absolute measure and material deprivation measure shed light on changing living standards for low-income families.

Although using the three measures increases complexity, it also increases our understanding of poverty and the role that policies play. So I think that using all three measures is a sound decision and one that should be carried forward.

The New Labour legacy

Tony Blair and Gordon Brown not only achieved a dramatic reduction in child poverty, they also put child poverty on the national agenda. It is notable that even while making deep cuts, the coalition government has emphasised its commitment to protect benefits for the poor. Although it remains to be seen to what extent this commitment will be maintained, it is nevertheless striking that it is being articulated.

Jane Waldfogel is Professor of Social Work and Public Affairs at Columbia University, visiting Professor at the Centre for Analysis of Social Exclusion at the London School of Economics, and author of *Britain's War on Poverty* (Russell Sage Foundation).

Healthcare competition saves lives

Under what circumstances does the introduction of choice and competition into public healthcare provision lead to improved outcomes? *Carol Propper* describes the key findings of CMPO research on competition and quality in the English National Health Service.

Governments faced with rising costs and growing demand are constantly searching for methods of delivering higher productivity in healthcare, or put more simply, ways of getting higher quality without increasing expenditure. One currently favoured mechanism is to encourage competition between the suppliers of care. But will this work?

The appeal is simple – competition works in the rest of the economy, therefore it should work in healthcare. Unfortunately for politicians, the simple appeal does not necessarily translate across sectors of the economy. There is, in fact, no strong theoretical support for competition in healthcare leading to better outcomes: the predictions of economic theory on this issue are quite ambiguous (Gaynor, 2006).

But under certain conditions, theoretical models do support a relationship between competition and quality. This is when prices are fixed by government and hospitals compete in terms of quality and not price.

Testing this theory is difficult because the observed competitiveness of a healthcare market may be driven by quality. For example, the presence of a high quality hospital may mean that competitors stay out of its market. Alternatively, hospitals in urban areas may face more competition but they may also use cutting edge technology and hence deal with more difficult cases and have worse quality outcomes. In both of these situations, it will appear that greater competition is associated with lower quality, but competition is not the driving factor.

Dealing with this is not easy without some kind of experiment. Luckily for those interested in the impact of policy in the UK, experiments may exist because governments change the direction of social and health policy relatively often. In particular, the English NHS is subject to frequent policy change as politicians use healthcare as part of their drive to win supporters. These changes can be exploited as a kind of 'natural experiment'.

The last Labour administration introduced competition between healthcare providers as part of its drive to increase productivity in healthcare. In 2006 the government mandated that all patients must be offered the choice of five, and by 2008 any, hospital in the NHS for their treatment. In addition, the prices that hospitals could charge were fixed by the Department of Health.

Competition among English hospitals saves patients' lives and decreases their overall length of stay, all without increasing overall expenditure

This policy change provided a natural experiment that researchers can exploit to understand the effects of competition on quality. Hospitals compete in geographical markets because patients prefer to be treated, *inter alia*, closer to home. Hospitals thus vary in the extent to which they face competitive forces simply because of geography. Some hospitals will be heavily exposed to the policy because they are located in or near urban areas, others will be less exposed because they are in rural areas.

Exploiting this fact allowed a team of CMPO researchers to explore outcomes before and after the introduction of competition across different markets. We looked at all admissions to hospitals in the NHS – around 13 million admissions – pre- and post-policy, which led to a number of findings.

First, the policy seems to have led to differences in patient flows between hospitals, even only two years after the reforms. The left-hand panel of the figure overleaf shows how exposed hospitals were to potential competition in their local markets just before the time of the policy introduction. The right-hand panel shows the change in exposure after the policy.

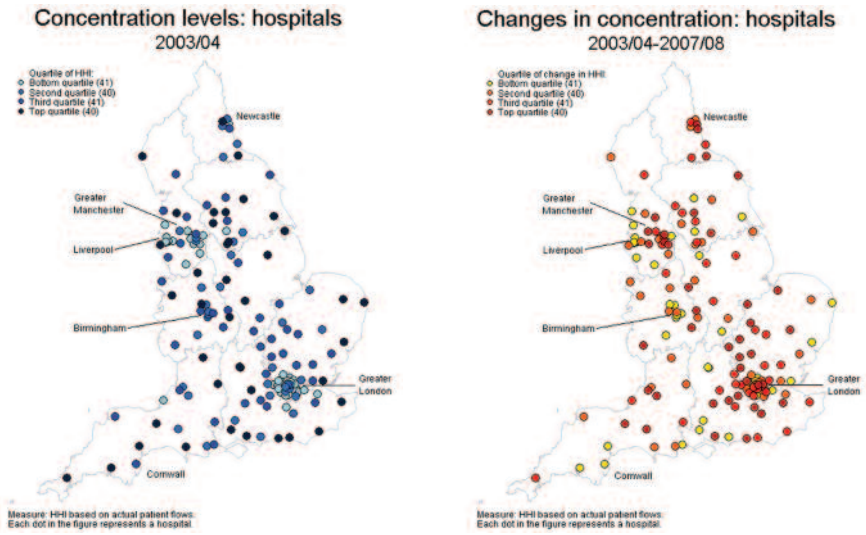
In the left-hand panel, hospitals are represented by dots and the colour of the dots represents the extent of potential competition. The lightest shade of blue shows those hospitals most exposed to potential competition and black indicates hospitals least exposed to potential competition. Not surprisingly, those hospitals located in major conurbations – London, Birmingham, Manchester, Newcastle – are most exposed to competition, while those in rural areas are least exposed.

In the right-hand panel, those hospitals with the biggest increase in potential competition are shown in dark red, those with the least in yellow. It is clear that not all the hospitals that faced the greatest increase in competition are in the urban areas. There is a clear set of hospitals located *around* urban areas that have experienced increases in potential competition, particularly in the South East outside London but also round Merseyside, Bristol and Newcastle. This suggests that the policy might have an effect on a larger set of hospitals than just the set located in highly urban areas.

Second, the research finds that hospitals rated as better by the health quality regulator before the policy reform attracted more patients after the reform and drew their patients from further away and from more locations post-reform. This suggests that patient choice is having some effect on the selection of hospitals by patients and that

Competition under fixed prices has beneficial results while competition where hospitals bargain over price and quality does not

Patterns of market concentration: pre-policy and changes post-policy



Merging failing hospitals may stifle competition and thereby fail to improve outcomes for patients

more patients are choosing – with the help of their GPs – to go to better hospitals.

Third, the research finds that hospitals located in areas where patients have had more choice since the NHS reforms have had higher clinical quality – as measured by lower death rates following admissions – and shorter lengths of stay than hospitals located in less competitive areas.

What's more, the hospitals in competitive markets did this without increasing total operating costs or shedding staff. These findings suggest that the policy of choice and competition in healthcare can have benefits – quality in English hospitals in areas in which more competition is possible has risen without a commensurate increase in costs (Gaynor et al, 2010).

One reason that the policy may be having this impact is the fact that prices are externally fixed. Research for the UK showed that when competition was introduced in the early 1990s in an NHS regime that allowed hospitals to negotiate prices as well as quality, there was a *fall* in clinical quality in more competitive areas. This is confirmed by research in the US healthcare market: where prices are set as part of the bargaining process between hospitals and buyers of healthcare, competition tends to be associated with poorer quality.

These results are supported by economic intuition. Where quality is hard to observe, buyers' responsiveness to quality differences will be low. Buyers will care more about price, which is easier to observe. In response, suppliers will tend to compete on price, leading to lower costs but also lower quality (Propper et al, 2008).

These results also suggest that the details of policy matter – or put more generally, that the rules by which competition takes place matter for outcomes. Competition under fixed prices appears to have beneficial results while competition where hospitals bargain over price and quality does not.

This, in turn, has policy implications for governments that are keen on market forces in healthcare. If competition is to work, price regulation has to be retained. A free-for-all in prices would mean a return to the 'internal market' of the 1990s, a regime in which hospitals competed vigorously on waiting times and ignored aspects of quality that are more difficult to measure.

In addition, the tendency of the UK government to merge failing hospitals needs to be looked at carefully. Mergers are popular with finance ministries in NHS-type systems because they remove what is often seen as 'excess capacity'. But while there may be gains from removing poor managers when a hospital fails, removing capacity by merger (rather than simply replacing the management team) will limit the extent of competition and may stifle the impetus given by competitive forces to improve outcomes for patients.

Carol Propper is Professor of Economics at Bristol University and Imperial College London.

Further reading

Martin Gaynor (2006) 'Competition and Quality in Healthcare Markets', *Foundations and Trends in Microeconomics* 2(6): 441-508.

Martin Gaynor, Rodrigo Moreno-Serra and Carol Propper (2010) 'Death by Market Power: Reform, Competition and Patient Outcomes in the National Health Service', National Bureau of Economic Research Working Paper No. 16164.

Carol Propper, Simon Burgess and Denise Gossage (2008) 'Competition and Quality: Evidence from the NHS Internal Market 1991-9', *Economic Journal* 118(525): 138-70.

Houses and happiness

The ups and downs of house prices are rarely out of the newspaper headlines. But is there any link between how the housing market is performing and how people actually feel? Do rising house prices make homeowners feel any happier? CMPO's *Anita Ratcliffe* explores these questions.

House prices in the UK more than doubled in real terms between 1995 and 2007 – and more than tripled in some areas, such as Greater London (see figure below). Arguably, people did not expect such rapid increases in house prices – implying sizeable, positive shocks to wealth for millions of households. If homeowners use some of this extra wealth to consume more and enjoy more leisure time, this points to a possible causal mechanism through which rising house prices could have a direct effect on people's happiness.

But there is another possible story involving house prices, which points to a slightly different relationship with happiness. Rising house prices may also reflect general economic circumstances. In boom times, people earn more – and raise their expectations of future earnings – and this affects both house prices, as people consume more housing, and happiness. In this case, house prices are simply an economic barometer rather than a causal driver of happiness, and it is higher actual and expected future earnings that affect happiness directly as well as driving up house prices.

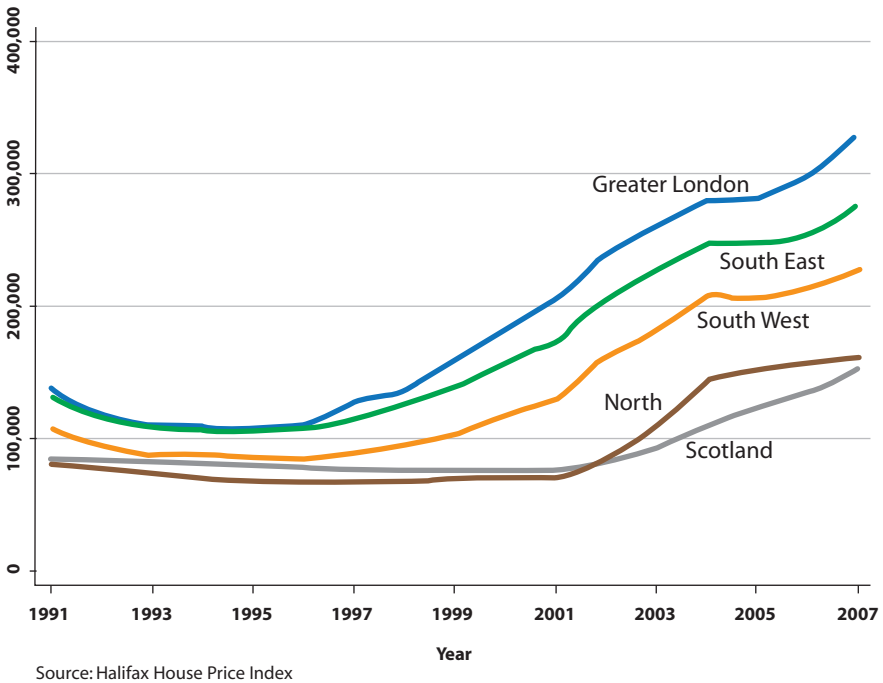
One possible way to understand better what is going on is to look separately at homeowners and non-homeowners. Non-homeowners lose out when house prices rise because getting onto the property ladder requires higher levels of saving, and because rental prices move in line with house prices. This implies that non-homeowners end up consuming less and enjoying less leisure time. Crucially, how people react to economic factors does not depend on their tenure status and this helps to identify what is really happening.

My research has investigated this issue in detail. I look at whether homeowners really do report higher levels of well-being when house prices are higher and I contrast this with the behaviour of non-homeowners. If non-homeowners report lower levels of well-being, this corroborates a wealth mechanism.

On the other hand, if non-homeowners also report higher levels of well-being, it suggests that house prices matter only in so far as they reflect economic conditions.

If reported well-being levels are unresponsive to house prices, it implies that people do not

Real house prices across selected UK regions (£s)



Source: Halifax House Price Index

There is a positive relationship between house prices and reported well-being for both homeowners and non-homeowners

care about house prices, perhaps because they have little effect on consumption and leisure. After all, homeowners must be willing and able to spend wealth locked away in housing before they can consume more and enjoy more leisure time. In practice this may mean that rising house prices have a bigger positive wealth effect for older households who are not looking to trade up.

An advantage of looking at self-reported well-being over consumption or leisure in isolation is that reported well-being picks up the combined effect of these variables, and quantifies how much house price developments matter based on how people feel.

My research is different from previous studies of well-being because I am interested in whether there is a difference in well-being outcomes across homeowners and non-homeowners as house prices fluctuate. Some studies find that more housing wealth, as measured by estimated property values, is associated with better well-being outcomes for homeowners. But the above discussion suggests that it is not possible to reach this conclusion without reference to non-homeowners.

Other studies relate area-level house prices to the well-being of everyone but do not allow the effect of house prices to vary by tenure status (the aim of these studies is to use house prices as a proxy for local price levels). These studies find no effect of house prices on well-being, but the possibility that diverging well-being reports across tenure groups, which leads to a zero effect in aggregate, cannot be ruled out.

My research uses data from the British Household Panel Survey (BHPS), which has interviewed a representative sample of UK households every year since 1991. An advantage of these data is that with multiple observations of the same person, I can control for fixed unobserved influences that explain why some people report higher levels of well-being than others.

For example, people with a positive outlook on life tend to be happier. This is important if happier people also live in areas with systematically lower (or higher) house prices. This means that the effect of house prices on happiness is identified by changes over time, rather than differences across regions, exploiting the fact that changes in house prices varied quite a lot across different parts of the country.

House prices seem to matter because they reflect something else that is relevant to well-being, such as economic circumstances

I construct a measure of the average house price in cities and towns, which is a more refined geography than used in previous studies and provides a better approximation to the house prices that people face. Area house prices are better than estimated property values because the latter reflect the choices of each household, which muddies the analysis.

Importantly, these data go back as far as 1991 (the first available wave of the BHPS) so my results are identified from fluctuations in house prices during the good and bad times.

My results show that once you take account of the fact that happier people tend to live in areas with lower house prices, there is a positive relationship between house prices and well-being. What's more, this is true for non-homeowners as well as homeowners, suggesting that house prices matter because they reflect something else that is relevant to well-being, such as economic circumstances.

Practically speaking, the association between house prices and reported well-being scores is small. A 1% increase in house prices shifts well-being scores by less than 1% of a standard deviation in well-being.

To shed more light on what is driving this association, I look for factors likely to influence both house prices and well-being. Area unemployment rates and earnings are potential candidates, but the link between house prices and well-being remains even after controlling for these variables. I also consider financial expectations (which may pick up beliefs about the economy) and neighbourhood satisfaction (which may pick up the quality of local public services and businesses in an area), but again the link remains.

Ultimately, it is easier to rule out what does not explain the association than to pinpoint what does explain it. This may be because the explanation is purely psychological. Perhaps the state of the housing market – and media coverage of the housing market – foster a 'feelgood factor' when house prices perform well – and vice versa.

The state of the housing market may foster a 'feelgood factor' when prices go up – and vice versa

This article summarises 'Housing Wealth or Economic Climate: Why do house prices matter for well-being?' by Anita Ratcliffe, CMPO Working Paper No. 10/234

For the full paper, see: http://www.bris.ac.uk/cmpo/publications/papers/2010/wp234.pdf

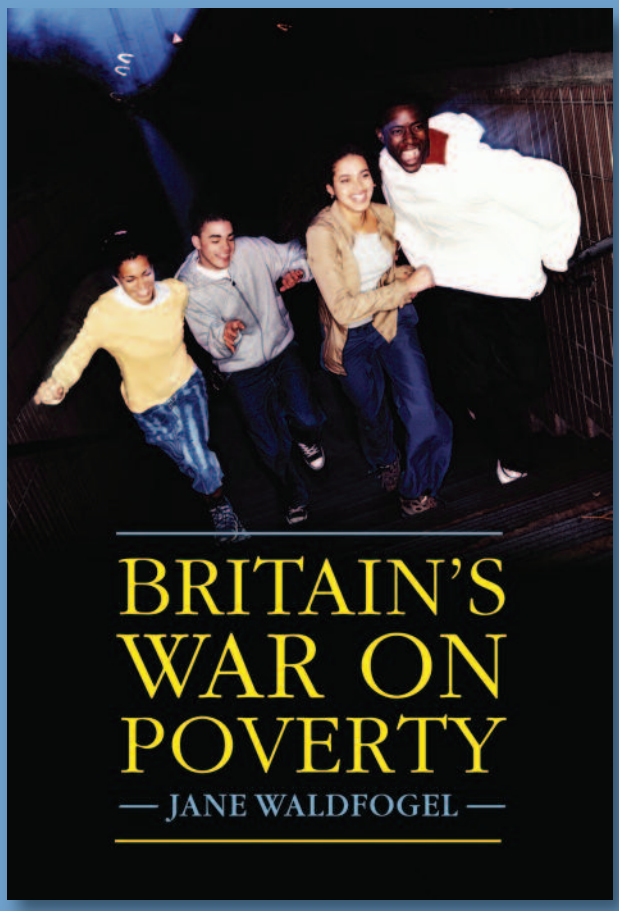
Anita Ratcliffe is a PhD student at CMPO

Britain's War on Poverty

Jane Waldfogel

In 1999, one in four British children lived in poverty—the third highest child poverty rate among industrialised countries. Five years later, the child poverty rate in Britain had fallen by more than half in absolute terms. How did the British government accomplish this?

Jane Waldfogel offers a sharp analysis of the New Labour government's anti-poverty agenda, its dramatic early success and eventual stalled progress. Comparing Britain's anti-poverty initiative to US welfare reform, the book shows how the policies of both countries have affected child poverty, living standards, and well-being in low-income families and suggests next steps for future reforms.



'A developed country declaring a major war on poverty comes around once in a generation. People will want to know why they did it, how they went about it, but, even more crucially, what the impact was on children. This book is the only one to cover all these dimensions and to do it with style. *Britain's War on Poverty* isn't just about Britain – it's about declaring war on poverty.
Paul Gregg, CMPO, University of Bristol

***Britain's War on Poverty* by Jane Waldfogel is published by the Russell Sage Foundation (http://www.russellsage.org).**

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