



**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.

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

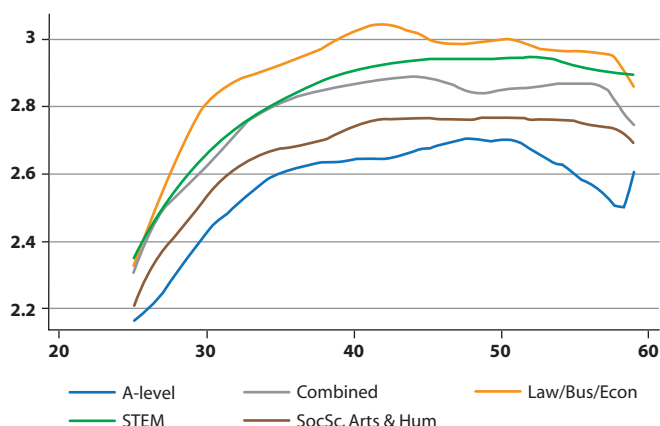
### Wage growth for graduates is stronger than for non-graduates but with significant differences across degree subjects

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

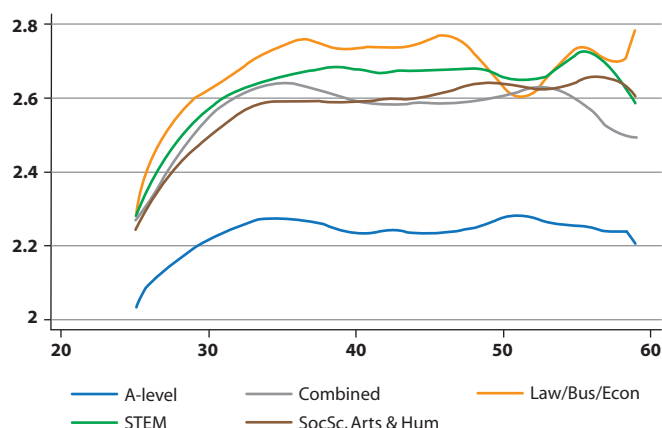
data as possible. The size of the dataset allows us to slice it by gender and by degree subject.

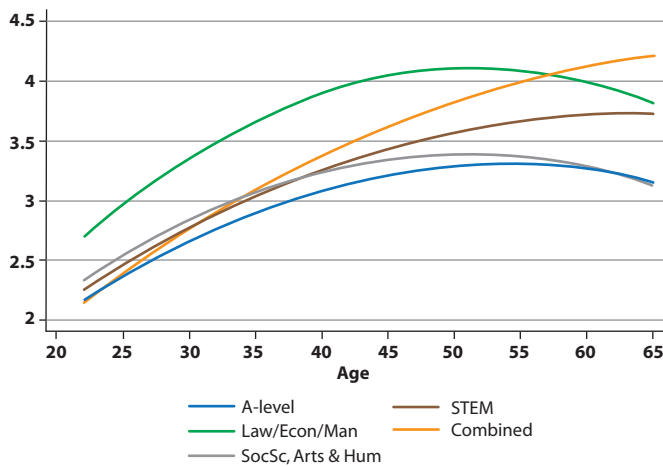
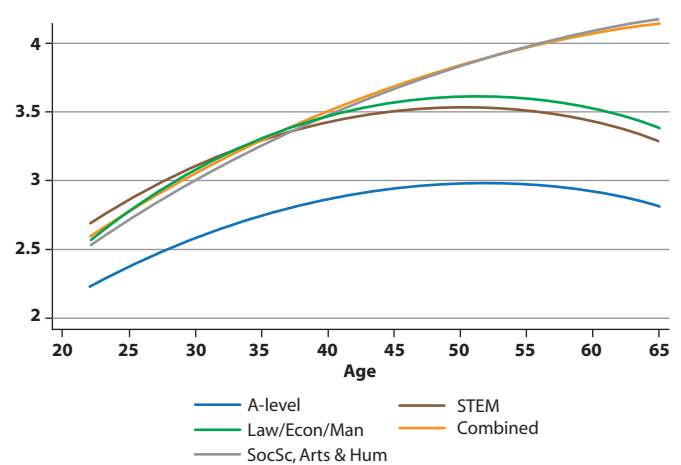
The darkest line is the group with at least two A-levels – and it is clear that the absolute gap between this and the other lines (for each

**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

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

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

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.

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### 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.