

The returns to higher education: new evidence from administrative data in the UK

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1 Introduction

Around 350,000 English students start a university degree each year, and most will leave with debts in excess of £50,000. This imposes significant costs on both students and the taxpayer – latest estimates suggest it costs the government around £9 billion to educate each cohort of undergraduate students, while three quarters of graduates will pay 9% of their income above £25,000 for thirty years after graduation.

Yet despite the clear importance of having good understanding of the returns to Higher Education (HE), the evidence base in the UK is extremely limited, largely due to data limitations. Blundell et al. (2000), use survey data to show that overall returns are around 17% for men and 37% for women in their early 30s. But this is based on a cohort of students that were born in 1958 and went to university in the late 1970s, meaning its relevance today is questionable. More recently, Walker and Zhu (2013) - in probably the most heavily cited piece of research by HE policymakers in the UK - estimate large lifetime returns of around 28% for men and 53% for women. But their findings are based on Labour Force Survey (LFS) data, which limits them to essentially a comparison of people who went to HE with those who have A-levels but did not.

There are many reasons why this comparison will not adequately capture the returns to HE. People who go to university might have better A-levels (in terms of grades or subjects), may come from more wealthy backgrounds, or may have a broader set of skills. All these factors are likely to be positively correlated with both attendance at university and subsequent earnings, which means if they are not controlled for when estimating the returns to HE, those estimates are likely

to overstate the value of a university degree.

This essay summarises the evidence from a recent report written by the Institute for Fiscal Studies (Belfield et al. (2018)) that attempts to fill the evidence gap. The report uses the new Longitudinal Educational Outcomes (LEO) administrative dataset to provide the latest estimates of the impact of Higher Education (HE) on individuals' early-career earnings. This dataset allows us to observe a rich array of individuals' pre-university characteristics, including their region, socio economic background, ethnicity and their entire academic history, including subjects and grades. We use this information to estimate the causal impact of university on earnings by age 29 of English educated students, based on everyone who went to university in the mid to late 2000s.

As well as estimating the overall average impact of attending HE on earnings at age 29, we are also able to go beyond the existing UK evidence by investigating how these returns vary for individuals studying different subjects or at different Higher Education Institutions (HEIs). We also investigate how these returns might differ for students with different prior attainment, based on their GCSE results and whether or not they studied a maths or science ('STEM') A-level. This will therefore provide vital evidence for prospective students choosing whether to attend university, where and what to study at university.

All of our estimates (unless otherwise stated) report the effect of attending HE at age 18 on annual gross earnings at age 29, conditional on being in employment. We compare our HE students with those who did not go to HE but had at least five A*-C GCSEs, controlling for differences in prior attainment, Key Stage 5 subject choices and family background. We focus on those who start HE, rather than just on HE graduates, as this is the relevant decision facing prospective students. This pioneering dataset enables us to account for many of the differences between those who do and do not attend HE, but there are many other factors which may affect this decision that are not accounted for, such as passion or preferences. Also these estimates focus on the monetary returns to university, which may not fully reflect the wider society benefits of these degrees. As such, some caution should be executed when interpreting these findings.

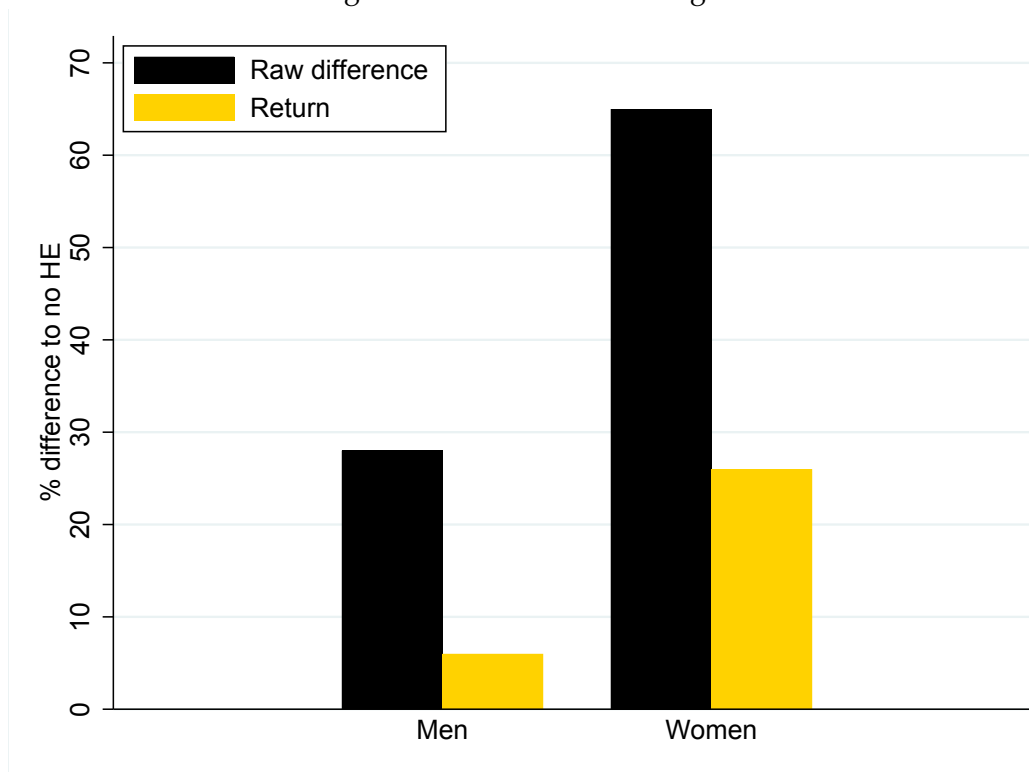
2 Overall returns to university

As shown in Figure 1, those who attend HE earn a lot more on average than those who do not. At age 29 the average man who attended HE earns more than 25% more than the average man (with five A*-C GCSEs) who did not. For women the gap is more than 60%.

However, a large portion of this difference can be explained by differences in pre-university characteristics: a typical HE student has higher prior attainment and is more likely to have come from a richer family than someone who does not attend. They would therefore be expected to earn more, even had they not gone to university.

Once we account for differences in pre-university characteristics, we estimate the average impact of attending HE on earnings at age 29 to be 26% for women and 6% for men. If we focus on the impact of graduating, these returns rise to 28% and 8% respectively: this increase in effect is quite large given the low number of dropouts (around 10%), and is driven by the fact that the average earnings outcomes for people who drop out of university are extremely poor.

Figure 1: Overall returns at age 29



The higher returns for women may be driven by the fact that women who attend HE typically

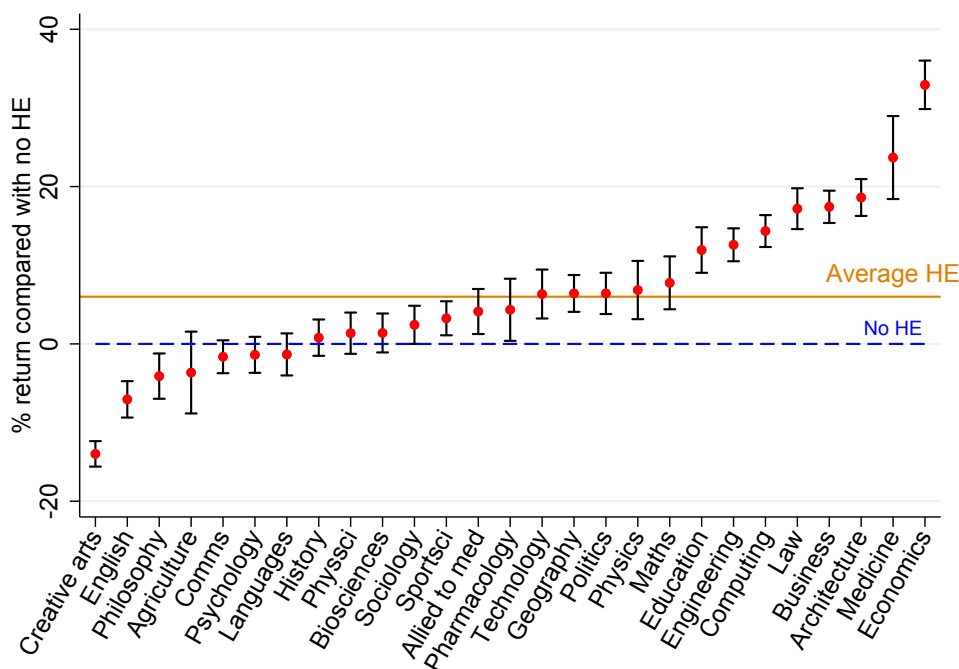
work longer hours than those who do not. This impact on working hours may well be causal, but it may also be larger at age 29 than at later ages if graduates delay having children.

For men, the returns are disappointing low, and are below previous estimates from the UK. This raises questions about the value of doing a degree for men. It should be noted, however, that age 29 is a relatively early point in their careers, and there is good reason to believe they will grow. It should also be noted that while the return is fairly low on average, that varies considerably across the different types of higher education men are able to do.

3 Variation in returns by subject and institution

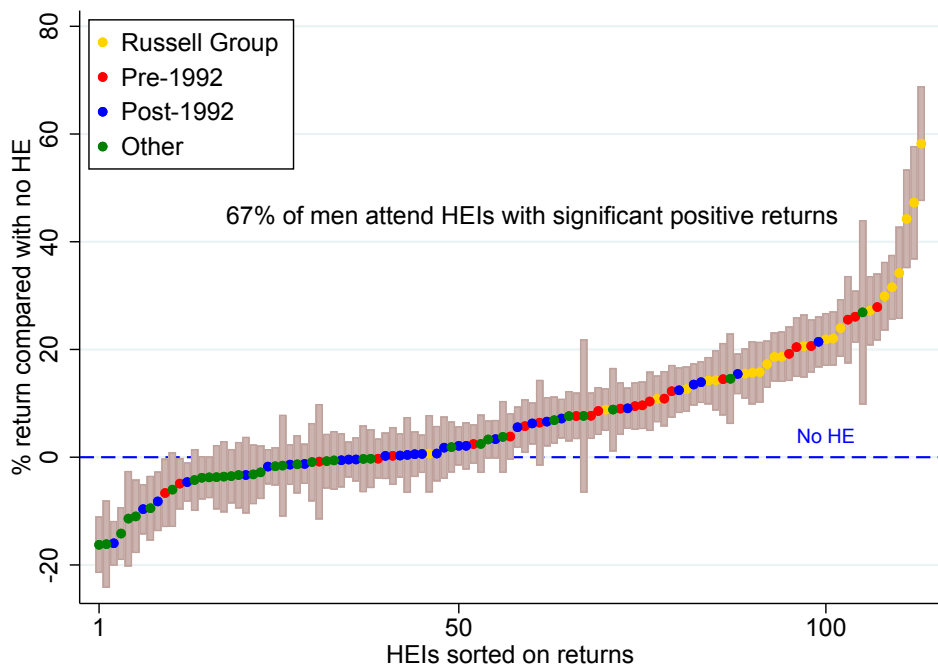
In Figure 2 we explore this further by investigating how returns vary by subject choice for men. We see that the average return masks considerable variation. Studying creative arts, English or philosophy actually result in lower earnings on average at age 29 than people with similar background characteristics who did not go to HE at all. By contrast, studying medicine or economics appears to increase earnings by more than 20%. For women, the pattern returns looks similar, except everything is shifted up. There are no subjects that have negative average returns, and studying economics or medicine increases their age 29 earnings by around 60%.

Figure 2: Estimated returns at age 29 by subject, men



We also investigate variation in returns by institution choice, and find that this also appears to be highly important. For men (see Figure 3), there are 12 institutions (accounting for 4% of male students) for which we estimate statistically significantly negative returns at age 29 on average, while there are 18 universities with average returns of more than 20%. Again for women the pattern is similar, but shifted up. Yet there remain two institutions (0.4% of female students) which have statistically significantly negative returns at age 29, while there are 66 institutions with returns of more than 20%.

Figure 3: Estimated returns at age 29 by HEI, men



A clear pattern from Figure 3 is that the top end is dominated by Russell Group universities. This was not necessarily what you might expect: there is no reason why the universities who do the best in terms of raw earnings would also do the best when it comes to earnings conditional on intake. Indeed, what we are estimating is very similar to value added measures of schools, and it is often not the highest performing schools in terms of raw scores that come at the top of the league tables when looking at scores conditional on intake. Part of this story is that while for schools there are limits to how well students can do in tests, there are not such binding constraints when it comes to earnings outcomes. One theory to explain this pattern is that there is significant variation in the types of teaching at different universities, and that the top universities are able to provide

their graduates with the skills required to get and succeed in the very best jobs. This means that they take the students who have very high expected earnings, but are still able to exceed expectations by delivering so many of them into very high paying careers. A more pessimistic outlook would suggest that there is a very strong signalling story: the top firms recruit those from the top universities not because of their observed skills, but because they take their graduation as a signal that they have the necessary skills to succeed. Commenting on this is beyond the scope of our research, but it is a crucial area of future study.

We are also able to investigate how returns vary within every subject and every institution. For example, studying at Cambridge yields positive returns of around 30% on average for both men and women, but some subject choices - for example creative arts - actually appear to result in lower earnings at age 29 than not going to university at all. This is surprising, as it suggests just getting in to Cambridge is not enough to guarantee positive returns.

We saw in Figure 2 that subject choice is important. In the UK, individuals typically choose a subject and then apply to a set of universities. It is therefore very common to ask whether subject or institution choice is more important in the UK system. Our findings are able to contribute to this debate. We find that even within subject, there is huge variation in returns. For example for men, every subject has at least one university with significant positive returns and at least one university with significant negative returns. This suggests that even once you have settled on a subject, your university choice is still highly important, if not more important. This is in contrast to much of the academic literature which plays down the significance of institution choices (e.g. Dale and Krueger, 2014).

4 Variation in returns by prior attainment

The returns to HE also differ considerably for different types of students (see Table 1). Attending HE only increases the age 29 earnings of lower prior attainment men (based on GCSE grades) without a STEM A-level by 4%. This compares to 20% for their peers who also do not have a STEM A-level but have high GCSE grades. The return is low because students with lower prior attainment are more likely to take low-returning subjects like creative arts, communications and sport science, and are more likely to attend lower-returning universities. However, this is not the

only explanation: even when they study the same subject or at the same type of university as their peers who have higher prior attainment, they experience lower returns.

Table 1: Returns overall and by prior attainment subgroup

	All	No STEM A-level			STEM A-level		
		Lower	Middle	Higher	Lower	Middle	Higher
Men	6%	4%	8%	20%	11%	9%	5%
Women	26%	23%	25%	31%	22%	16%	23%

Men with higher prior attainment and a STEM A-level have an estimated return of 5%, which might be lower than expected. This is hugely varied: studying law, medicine or economics increases their earnings by around 20%, and the return to attending a Russell Group for this group is around 10%. On the other hand, studying arts English, communications, psychology, languages and history, or attending Post-1992 or Other universities actually appears to result in lower earnings for this group than they would have achieved had they not gone to university (of course, these individuals may be making these choices for reasons other than to try to maximise their earnings). These particular estimates should be treated with caution, as overall only 5% of individuals in this group do not go to HE, and they are likely to be quite unusual - indeed, they have very high average earnings of around £40,000 per year by age 29.

Among women, the overall returns to HE are high for all groups, though some similar patterns emerge. Higher prior attainment women without a STEM A-level have higher returns than their lower attainment peers. Unlike for men, there is little evidence of lower prior attainment women without a STEM A-level experiencing lower returns when studying the same subject as their higher attaining peers. Instead, the lower returns for this group appear to be driven by a higher propensity to study lower (although still significantly positive) returning subjects such as social care, sociology or education, and because they are more likely to attend lower-returning universities.

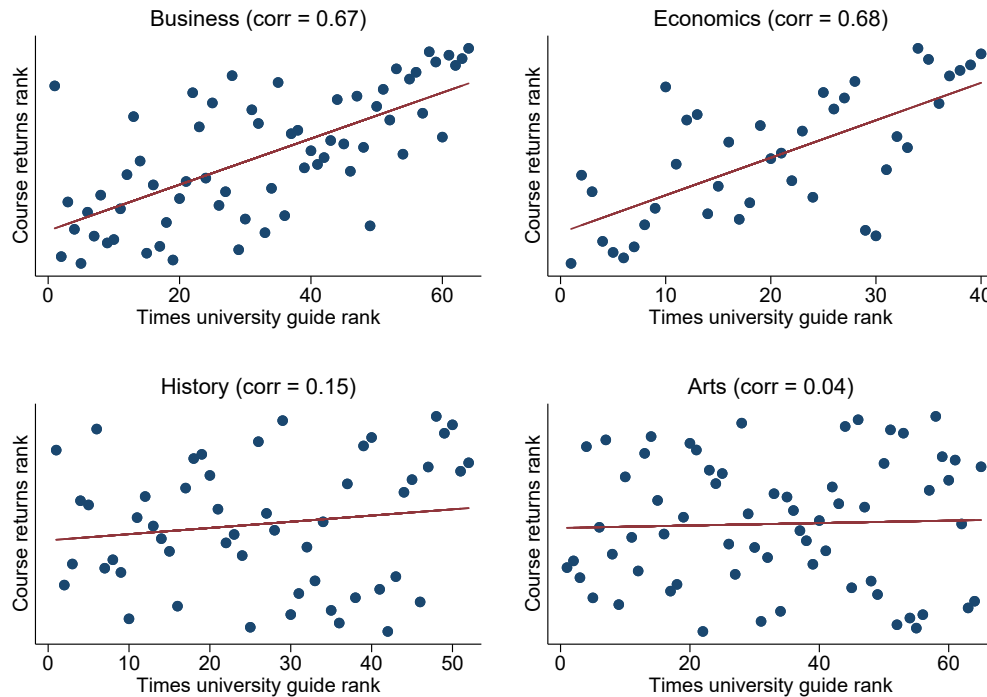
5 Policy implications

The high returns to higher education for women demonstrate the role of university in reducing the gender gap. For men, the returns are perhaps disappointingly low. The next step of research

programme is to try to estimate lifetime returns to HE, taking into account foregone earnings while studying as well as any additional tax and student loan payments. While we are unable to say definitely at this stage, these results suggest it will be unambiguously worthwhile for women, on average, while for men it is more uncertain.

For men with lower prior attainment and without a STEM A-level, the returns are lower still, at around 4% on average, and there are many subject choices that yield extremely low returns. This is a particularly important when considering the impacts of expansion in the HE system: in our period of study, 70% of all students with five A*-C GCSEs that did not attend university fell within this lower prior attainment, without STEM A-level group. On the other hand, there are courses - such as business and computing - which add at least 10% to the earnings of this group. This suggests the government should pay close attention to the courses individuals with low prior attainment are studying.

Figure 4: Plot of our course ranking on Times Good University Guide ranking



Finally, the former Minister for Higher Education, Sam Gyimah, suggested that estimates of returns similar to those presented here may be used as measures of quality. This is particularly interesting given Figure 4, which plots university rank based on our estimates on the Times Good

University Guide ranking from 2010. While there is some correlation for business and economics (although this seems to be heavily influenced by a handful of elite universities), there is extremely little correlation for history and for arts degrees, and this is true for the majority of subjects. If the Minister was serious, the results of this study could result in a significant shake-up of the system.

References

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