



Social Mobility
Commission



Labour market value of higher and further education qualifications

A summary report

Research report

February 2023



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About the Commission

The Social Mobility Commission is an independent advisory non-departmental public body established under the Life Chances Act 2010 as modified by the Welfare Reform and Work Act 2016. It has a duty to assess progress in improving social mobility in the UK and to promote social mobility in England. The Commission board comprises:

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Parminder Kohli, Senior Vice President EMEA at Shell Lubricants.

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Executive summary

Key findings

- On average, those who study qualifications in higher education (HE) or further education (FE) earn more compared to those who do not.
- This persists even when accounting for an individual's personal characteristics, suggesting that on average studying a qualification in HE or FE is associated with a positive value-add in earnings.
- In FE, studying a qualification higher than someone's current level is associated with higher future earnings. This may imply that working your way up the FE qualification ladder can boost earnings.
- In HE, there is a lot of variation in value-add across subjects, with science, technology, engineering, and maths (STEM) subjects, law and economics generally being associated with higher earnings. In FE, it is harder to draw conclusions, but subjects such as business administration and engineering have a high value-add for women and men respectively.
- In HE, students from disadvantaged backgrounds are disproportionately less likely to attend universities or study subjects associated with higher earnings when compared to their wealthier peers with similar grades.

What do we mean by value-add?

The return to earnings associated with studying a qualification compared to similar individuals who did not. This usually involves accounting for someone's prior attainment, geographic measures such as region, a measure of disadvantage such as free school meal (FSM) eligibility, school attended, and protected characteristics (such as gender).

Summary

1. On average, studying for a qualification in higher education (HE) or further education (FE) is positively correlated with someone's future earnings.
 - At the age of 29, men who attend HE tend to earn 25% more than those with 5 GCSEs (A* to C grades) but who did not go to university. For women, attending HE is associated with 50% higher earnings.¹
 - For FE, there are various pathways and qualifications at different levels. Therefore, it is not straightforward to summarise earnings returns, especially as a proportion of people with an FE qualification pursue HE studies. In general, returns increase with higher levels and are higher for apprenticeships than equivalent classroom-based qualifications.
2. However, as people who achieve qualifications may already have a higher earnings potential (for reasons such as having higher prior attainment) we need to take into account a person's characteristics to understand value. We refer to this as value-add (see Annex for an example of the characteristics accounted for).
3. After controlling for personal characteristics, there is still a positive value-add in earnings associated with studying for qualifications in either HE or FE.
 - Attending HE is associated with 19% higher earnings for men relative to men of similar characteristics. For women, this figure is 24% higher relative to women of similar characteristics.²
 - Within FE, the value-add also tends to be positive as you move up a level, implying that studying for a higher qualification level is associated with positive returns. Higher-level qualifications such as level 4 and 5 are associated with higher earnings when compared to level 3 qualifications.³ The highest returns are for level 4 for men and level 5 for women. However, there may be relatively few qualifications available at these levels and only a relatively small number of people pursue them. In addition, intermediate and advanced apprenticeships may have a positive effect on earnings compared to vocational qualifications at the same levels.

¹ Chris Belfield and others, '[The impact of undergraduate degrees on early-career earnings](#)', 2018. Published on GOV.UK.

² Chris Belfield and others, '[The impact of undergraduate degrees on early-career earnings](#)', 2018. Published on GOV.UK.

³ See Table 1 in Section 2 for more information on which qualifications are at which level in further education.

4. In HE, there is a lot of variation in returns by university type:
 - More academically selective universities tend to have a higher value-add, while less selective universities tend to have a lower value-add.
 - However, on average, the more selective universities also tend to be disproportionately less accessible to pupils from lower socio-economic backgrounds (SEB). Accessibility may have improved in recent years.
5. In HE, on average, achieving a higher degree class is associated with a higher value-add in earnings. Women who achieve a first-class degree earn 3.5% more and men 7% more than people of similar characteristics who achieve a 2.1.⁴
6. Within HE, students from disadvantaged backgrounds are more likely to choose less selective universities and courses than students with similar grades from wealthier backgrounds. Factors related to the school attended (such as pupil peer effects) may play a major role.⁵
7. In HE, science, technology, engineering, and maths (STEM) subjects, law and economics tend to have both higher average earnings and a higher value-add than other subjects.
8. In FE, there is some evidence of returns by subject type. Subjects such as engineering for men and business administration and law for women tend to have a higher value-add.
9. In FE, some available evidence suggests a modest difference in earnings according to the institution attended.
10. Overall, the evidence base on labour market returns is quite strong for HE. For FE, although there are some robust studies, the picture is more complicated which makes it harder to summarise earnings outcomes. This may also be due to more limitations in the data available to study the outcomes for FE. Analysing labour market outcomes for FE is challenging due to the highly fragmented nature of the FE system and the amount of reform it has undergone, particularly in the past decade. This means there have been a high number of courses which have been created or reformed. As a result, findings from research 10 years ago may not be as representative of the value of studying an FE qualification today, whereas the HE qualifications system tends to undergo less reform. Many of those who study FE progress onto HE and this means it is hard to disentangle the impact on earnings resulting from FE.

⁴Jack Britton and others, '[How much does it pay to get good grades at university?](#)', 2022. Published on IFS.ORG.UK.

⁵Stuart Campbell and others, '[Matching in the dark? Inequalities in student to degree match](#)', 2021. Published on NBER.ORG.

11. Overall, the data available is of high quality for analysing the labour market outcomes resulting from qualifications in HE and FE. The main data source used for England is the Longitudinal Educational Outcomes (LEO) dataset⁶. Although there are some limitations, such as the inability to capture working hours (to observe, for example, part-time workers) or identifying which occupations those who complete a given qualification get a job in. Also, the age range of the LEO dataset is restricted, which limits the scope of analysis to relatively young individuals.

⁶ Longitudinal Educational Outcomes (LEO) dataset. LEO is a dataset that is the first of its kind in England to collect and link administrative data on school attainment, grades, post-16 education and earnings for pupils born from 1986 onwards.

Introduction

Background

In March 2022, the government published the [Inclusive Britain](#) policy paper.⁷ It set out the government's actions in response to the recommendations made by the Commission on Race and Ethnic Disparities (CRED). The paper highlighted a number of recommendations which overlap with areas of Social Mobility Commission (SMC) interest, particularly the focus on enhancing social mobility through education choices.

The paper identified that it is important to provide transparent ways for parents and young people to understand what the implications are for enrolling on a course at a certain institution. They should also be able to compare options. This includes non-university routes to higher-level qualifications. We welcome the focus on boosting social mobility by equipping young people with the information they need to make informed choices about their future.

The SMC has committed to take forward Action 53 of the Inclusive Britain report. We hope to improve the information available to young people about the labour market value of qualifications. This is with a view to better their employment prospects. It states:

“To help disadvantaged students to choose the right courses for them and to boost their employment prospects, the Social Mobility Commission will seek to improve the information available to students about the labour market value of qualifications and, where possible, the impact of those qualifications on social mobility.”⁸

Addressing this issue will not be simple or straightforward. Therefore, to meet our commitment, we needed to improve our understanding of the evidence on the labour market value of qualifications. To support this, we have published this report in which we review some of the current evidence on labour market outcomes of qualifications in both HE and FE. This includes

⁷ Department for Levelling Up, Housing and Communities, and Race Disparity Unit, '[Inclusive Britain: government to the Commission on Race and Ethnic Disparities](#)', 2022. Published on GOV.UK.

⁸ Department for Levelling Up, Housing and Communities, and Race Disparity Unit, '[Inclusive Britain: government to the Commission on Race and Ethnic Disparities](#)', 2022. Published on GOV.UK.

considering how earnings vary by qualification type, subject type, institution type, and to understand if there are key gaps in the evidence. We also conduct some exploratory analysis to understand the relationship between the earnings associated with studying at universities and their performance on selected access metrics.

The main purpose of this report is to develop our understanding of the evidence on the labour market value of qualifications to help inform how we can proceed to meet Action 53. As we improve our understanding of the evidence on labour market returns we want to identify how we can improve access to information for all students, especially those from disadvantaged backgrounds. This will help prospective students, particularly those from more deprived backgrounds, to choose the right course and to boost their employment prospects.

As more people than ever proceed onto higher and further education, it is crucial that prospective students are equipped with the information they need to make informed decisions. This is especially important as there are more choices than before on which qualifications to study.

The labour market value of qualifications is important because many students may hope to use their qualifications to embark on their desired careers. Furthermore, in our State of the Nation (2022) report, we showed how employment opportunities and earnings potential play an important role in enabling social mobility.⁹ For these reasons, it is crucial we further our understanding of the labour market value of qualifications to support policymakers and education providers, and enable prospective students to make more informed decisions on which qualifications to study.

⁹ Social Mobility Commission, '[State of the nation 2022: a fresh approach to social mobility](#)', 2022. Published on GOV.UK.

Why making judgements about value is difficult

Before we summarise the evidence we have reviewed, it is important to highlight that making judgements about the value of qualifications is difficult. We urge the reader to consider the below challenges with understanding value, before proceeding to the next sections. Making judgements about the value of a qualification is difficult for the following reasons:

Counterfactual

To understand the value of a qualification, we often need a benchmark (often referred to as a counterfactual). This is to compare the returns of someone who studies a qualification to someone who does not. However, it is not clear what an ideal counterfactual would be to compare to someone doing a HE or FE qualification. This is because there are many unobserved factors such as career aspirations, personal interests and work ethic which cannot be controlled for in the data.

It is not easy to understand what a person would be doing if they weren't studying for the qualification. In HE, comparisons are often made to people with similar characteristics who do not go to university. However, in FE it is harder to make such comparisons, given it is a more diverse system and the fact that most people pursue some other type of post-16 qualification.

Variation within cohort

It is hard to make overall judgments about how valuable a course is on average, since people may study courses for different reasons. This is particularly likely to be the case for FE, for which there may be even more variety in circumstances than in HE. We try to control for this by using age, but this is not a perfect control as circumstances can vary a lot for people of the same age. For example, the circumstances of an 18 year old who needs to learn basic numeracy skills (such as level 2) to prepare themselves for doing a level 3 qualification in the future are quite different to those of an 18 year old who chooses an advanced technical FE qualification over university.

A qualification is often a stepping stone

Many study for a HE or FE qualification only to do a subsequent qualification rather than immediately progressing to the job they want. This means we need to consider the time horizon on which we are looking at outcomes. Not doing so risks underestimating the impact a qualification might have on earnings. For example, we might observe low earnings for someone after completing a qualification, but this may be due to them continuing to study for another qualification.

As someone's future qualifications may contribute to a higher earnings potential, we may also need to consider whether a qualification which enables progression to a higher-level qualification is considered a success. It is possible that FE qualifications are more likely to act as a stepping stone. Therefore, determining what success looks like for an FE student may be even harder.

For those going straight into employment, it is not just about the money

While it is important to address low quality and 'low value' courses in relation to labour market outcomes and the cost to the government and taxpayers, people may choose lower earning qualification pathways for other reasons. If we were to judge courses solely on earnings outcomes, we may wrongly determine that courses such as social care do not add much value, when in reality, they contribute hugely to society. On the other hand, if someone studies a qualification (such as art) that often leads to relatively low earnings but is more fulfilled in their career and life, are we right to deem this course a low-value course? Such a course may lead students to enter an occupation of their choice, utilise their full talent and potential, and contribute to their social and emotional development.¹⁰ Unfortunately, key datasets do not typically include occupation, and our understanding of this is limited.

Time horizon

It takes time for someone to get their preferred job or career. It is likely that graduates of HE and FE qualifications will take a few jobs to find their feet. Often the route into a preferred career is

¹⁰ Christine Farquharson and others, '[Education inequalities](#)', 2022. Published on IFS.ORG.UK.

not straightforward. So we need to consider the time horizon we observe earnings at, as graduates may not yet have reached their preferred career path. To overcome this challenge it may be worth looking at earnings at a later stage, at least covering an individual's 30s and 40s. For this we need to use longitudinal studies such as the National Child Development Survey. However, such survey-based evidence is based on smaller samples making it difficult to investigate returns for narrowly defined courses. The returns applicable to older people may not be so relevant to young people because the education and the labour market may have changed substantively.

Gender gap

We need to split earnings by gender because of the difference in career choices and working patterns which men and women tend to make. For example, returns at different ages vary significantly as women are more likely to work part-time or take breaks from their careers (such as for maternity leave). These differences in career choices are reflected by differences in subject choices, as men may be more likely to study subjects such as computer science, whereas women may be more likely to study subjects such as nursing.

Value-add

We have interpreted the findings from the literature with great caution. We have focused on understanding what the actual value-add to earnings are from studying a given HE or FE qualification. Other measures of labour market outcomes are also important, such as employment rates, but we have focused on earnings value-add because this provides a more detailed picture of outcomes.

Why do we want to focus on value-add?

We are interested in understanding what a HE or FE qualification adds to someone's ability to earn more. For example, suppose we were interested in the returns associated with studying at a top university which tends to select very high-achieving pupils. These pupils would have likely done well even without studying at this university, so we need to take this into account when observing their earnings after graduation. Otherwise we risk attributing their high earnings to the university, even if it did not provide any additional value in earnings potential.

Why do we need to be careful?

To interpret estimates as 'causal', most of the studies discussed here (using recent administrative data from England) require making an assumption that the unobservable factors mentioned above (for example, motivation and personality) are not driving the earnings outcomes we observe. This is a limitation we need to consider when interpreting the findings of the literature. Furthermore, an estimated return only gives the average and there is variation around that average. This means that a given individual cannot assume that they will acquire the 'average return' to any particular qualification.

How we approached looking at labour market value

As there is a large literature base we decided to limit the scope of review to focus on the following:

- Studies which look at the earnings returns to studying qualifications in HE or FE. However, as this report is only the first step in our process of understanding the evidence, we hope to include other labour market outcomes such as employability in our future work.
- Although we are also interested in postgraduate study, due to time constraints we narrowed our focus to undergraduate study only to improve our understanding of the opportunities available to school and FE leavers.
- Studies which are relatively recent and made use of the LEO data environment to track school pupils as they proceed to HE and FE qualifications and then into the labour market. These studies take advantage of the newly available administrative dataset for England and benefit from larger sample sizes. Another benefit to using administrative data is that they are less prone to selection biases than survey-based studies.

Summary

- This report is part of the Social Mobility Commission's commitment towards Action 53 from the Inclusive Britain paper. This involves improving the information available to students about the labour market value of qualifications.
- It is not a full review of all available literature on this subject. This is a first step in building our knowledge and evidence base, and we hope to explore the topic further as we continue to work on Action 53.
- We are especially interested in value-add, or whether doing a higher or further education course leads to someone earning more. Interpreting value-add needs to be done carefully and is not a perfect measure, but is useful for understanding average earnings returns for different qualifications.
- Making judgements about value is not easy. There are lots of factors which cannot be easily measured by the data, like someone's interests, job and life satisfaction.

1. Higher education

The labour market returns associated with studying in higher education

Overall, the evidence we reviewed suggests that the labour market returns associated with studying for a degree are generally positive. On average, the literature suggests, those who attend university earn more than those who do not.¹¹ At the age of 29, men who went to university earn on average around 25% more than men with 5 GCSEs (A* to C grades) who did not attend university. For women, this gap is more than 50%. Much of this gap can be explained by differences in pre-university characteristics. People who go on to higher education (HE) tend to have higher prior attainment and are more likely to come from wealthier backgrounds than those who do not – so would have been expected to earn more even if they had not gone to university.

Even after taking these characteristics into account, studying for a degree is still associated with higher returns. This suggests a positive value-add resulting from attending HE. Britton and others (2021) find that attending HE is estimated to increase earnings on average by 7% for men and 24% for women at age 30.¹² Belfield and others (2018b) find similar results when considering early work experience.¹³ They show that, after 6 years of work experience, incomes are on average 19% higher for men and 24% higher for women who went to university. The value-add associated with studying for a degree may therefore become more apparent for men once they begin to accumulate work experience.

This trend appears to continue as individuals reach their 30s, during which the median average earnings for HE graduates are higher for males compared to females. After accounting for individual background characteristics and prior attainment, Britton and others (2020) estimate that average earnings for men who were aged 30 in 2016 will rise by £15,000 from age 30 to 40, compared to £5,000 for non-graduates. The median earnings growth for female graduates in

¹¹ Chris Belfield and others, '[The impact of undergraduate degrees on early-career earnings](#)', 2018. Published on GOV.UK.

¹² Jack Britton and others, '[How much does degree choice matter?](#)', 2021. Published on IFS.ORG.UK.

¹³ Chris Belfield and others, '[The impact of undergraduate degrees on early-career earnings](#)', 2018. Published on GOV.UK.

their 30s is moderate compared to male graduates, but still higher than female non-graduates – predicted at £5,000 between ages 30 and 40 compared to no growth for non-graduates.¹⁴ This gender difference may reflect that women tend to be more likely to opt for part-time work, choose degrees with lower-earnings returns, work in lower-paying sectors and also take time off for maternity leave.

The trend of a positive impact on earnings associated with studying in HE also continues when estimating returns over an individual's lifetime. Britton and others (2020) find that after taking factors like tax and student loan repayments into account, average overall lifetime returns are around £100,000 for women and £130,000 for men.¹⁵ ¹⁶ This represents around a 20% boost in average net lifetime earnings for women and men. However, it should be noted that although earnings are estimated to be significantly higher for male and female graduates over their life-cycle, it is unclear how much is due to the skills developed while studying for their degree. This caveat requires particular attention as these estimated lifetime returns are based on raw earnings and do not represent value-add.

How do returns vary by degree classification?

The evidence we reviewed suggests that the degree classification achieved may be related to someone's labour market outcomes. As might be expected, a higher degree class is associated with higher earnings.

Britton and others (2022) estimate raw or unconditional earnings premiums by degree class relative to an upper second (2.1).¹⁷ They found that women with a first earned around 9% more than women with a 2.1, and men with a first earned around 13% more than men with a 2.1. For women and men with a lower second (2.2), earnings were around 15% lower than those with a 2.1. This increases to around 27% lower earnings for those with a lower degree class than a 2.2, when compared to those with a 2.1.

¹⁴ Jack Britton and others, '[The impact of undergraduate degrees on lifetime earnings](#)', 2020. Published on IFS.ORG.UK.

¹⁵ Jack Britton and others, '[The impact of undergraduate degrees on lifetime earnings](#)', 2020. Published on IFS.ORG.UK.

¹⁶ It is worth noting this reflected the tax and student loan repayment system at the time and there have been reforms since, such as those announced in February 2022.

¹⁷ Jack Britton and others, '[How much does it pay to get good grades at university?](#)', 2022. Published on [IFS.ORG.UK](#).

When estimating the value-add of a degree classification by controlling for observable characteristics (such as region and prior attainment), they found an increase in earnings associated with a first-class degree over a 2.1 of around 4% for women and 7% for men.^{18 19} A 2.2 is associated with 7% lower earnings compared with a 2.1 degree for women and 11% lower earnings for men.

Figure 1 shows the trend of median earnings by degree class over time for men and women.²⁰ Across the period studied (between 2002 and 2013), male graduates with a first-class degree had median earnings of around £4,000 higher than those who graduated with a 2.1 degree. Female graduates with a first-class degree had around £2,000 higher earnings on average than those with a 2.1 degree. Compared to the overall median earnings for graduates, median earnings for men who got a first-class degree were around £5,000 higher, with negative returns for those with a 2.2 or third-class degree. Similar results were found for women, but at slightly lower levels with those graduating with a first-class degree on average earning around £3,000 more than the median.

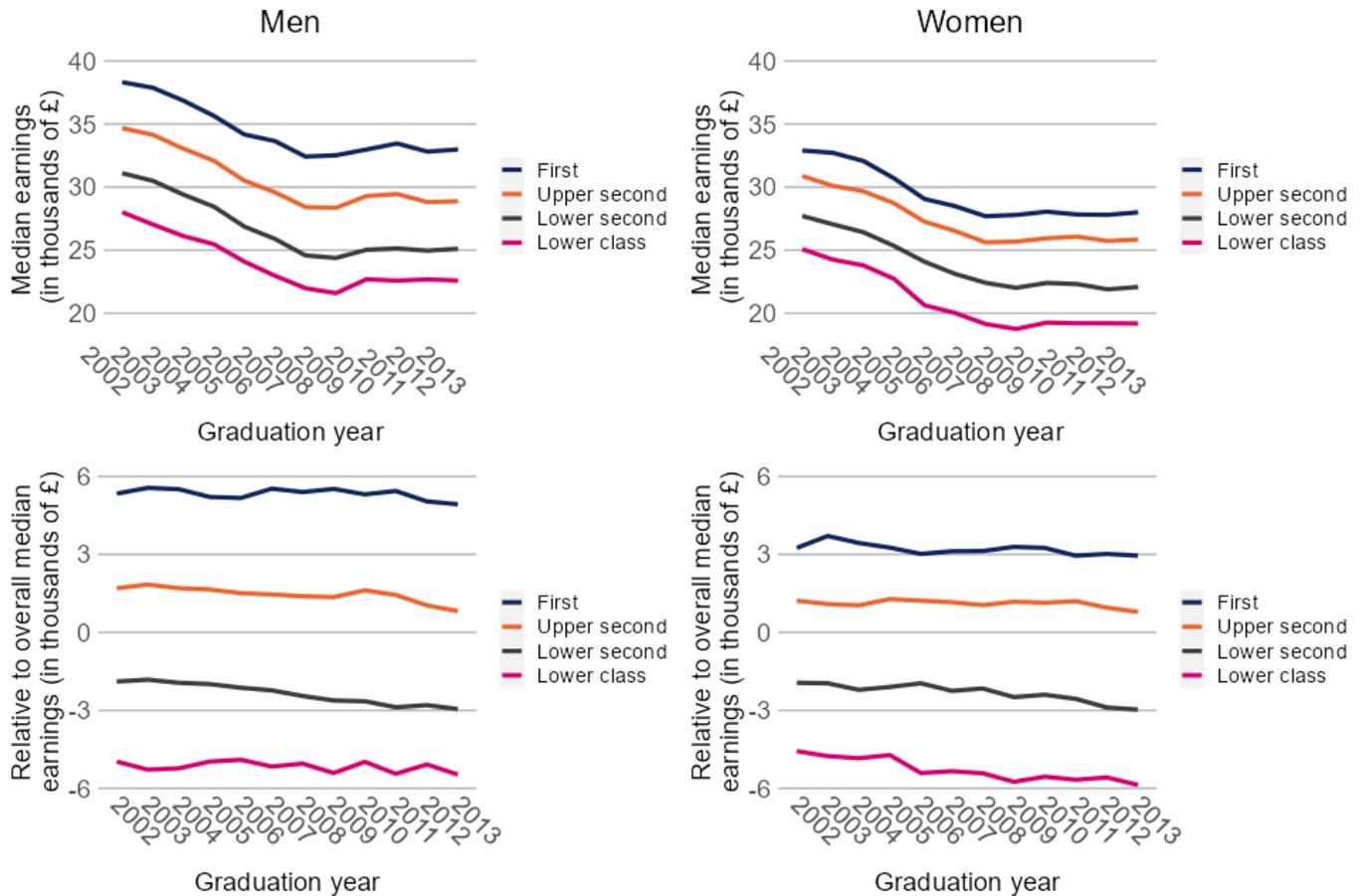
¹⁸ The authors state the following “observable characteristics that include background, prior attainment and university controls. The background controls include a socio-economic indicator (following that used in Belfield and others (2018)), region, ethnicity and school type (state or independent school). The prior attainment controls include key stage 2 (age 11), key stage 4 (age 16) and key stage 5 (age 18) test scores by subject. The university controls include indicator variables for university group and subject studied at university, as well as for whether a student entered university at age 19 or older” on page 15 of their paper here: Institute for Fiscal Studies, [‘How much does it pay to get good grades at university?’](#), 2022. Published on IFS.ORG.UK.

¹⁹ Jack Britton and others, [‘How much does it pay to get good grades at university?’](#), 2022. Published on IFS.ORG.UK.

²⁰ Figure reproduced from Jack Britton and others, [‘How much does it pay to get good grades at university?’](#), 2022. Published on IFS.ORG.UK.

Figure 1: Median earnings by degree class 5 years after graduation.

Estimates of median earnings in pounds and relative to the overall median graduate earnings for the graduation cohorts of 2002 to 2013, by gender and degree class achieved.



Source: Britton and others, (Institute for Fiscal Studies (IFS), '[How much does it pay to get good grades at university?](#)', 2022. Figure 10.²¹

Note: Sample selection is described in the note of table 4 in the source paper.²² The overall median includes graduates only.

²¹ Jack Britton and others, '[How much does it pay to get good grades at university?](#)', 2022. Published on [IFS.ORG.UK](#).

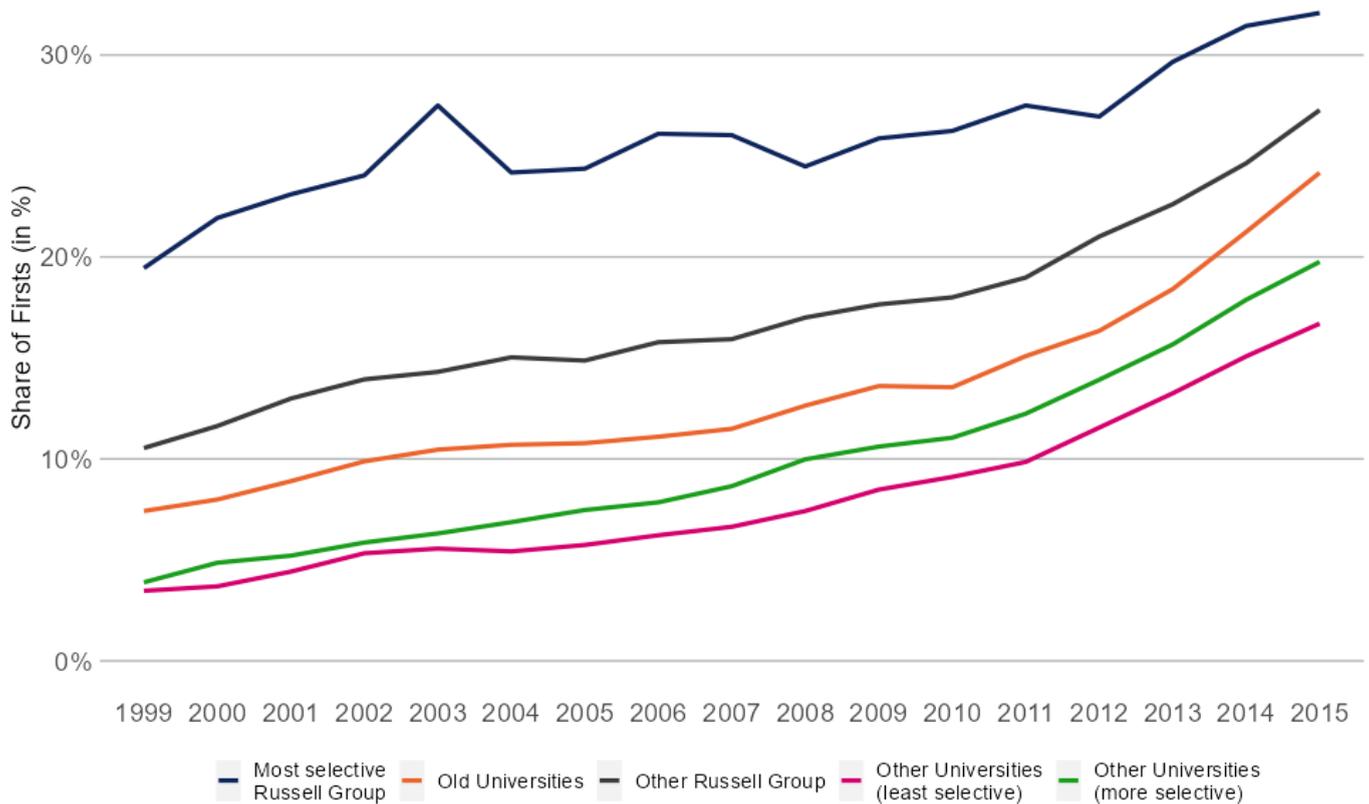
²² Jack Britton and others, '[How much does it pay to get good grades at university?](#)', 2022. Published on [IFS.ORG.UK](#).

In recent times there has been debate about the possibility of grade inflation at universities. This links to a particular concern over grade inflation resulting in devaluing a high-class degree and the labour market returns associated with it. Britton and others (2022) find that while the share of firsts has grown generally in the last 20 years, more selective universities have a higher share of awarded first-class degrees.²³ Figure 2 shows that the share of firsts at the most selective Russell Group universities has increased by over 10% from 1999 to 2015 to around 33% of all grades awarded. While there have been similar increases across institutions over the same period, this compares to around 17% in 2015 for the least selective universities.

²³ Jack Britton and others, '[How much does it pay to get good grades at university?](#)', 2022. Published on [IFS.ORG.UK](#).

Figure 2: Firsts by university type over time.

Share of first-class degrees at UK universities in percent between 1999 and 2015, by university type.



Source: Britton and others (IFS), [‘How much does it pay to get good grades at university?’](#), 2022. Figure 9.²⁴

Note: Sample selection is described in the note of table 4 in the source paper.²⁵ ‘Most selective Russell Group’ contains the University of Oxford, University of Cambridge, Imperial College London, and The London School of Economics and Political Science. ‘Russell Group’ consists of all other Russell Group universities. ‘Old universities’ consists of the remaining universities which gained status prior to 1992 (often referred to as ‘pre-1992’ universities). The remaining universities are split into equal-sized groups according to the average key stage 4 score of students, these are ‘Other (more selective)’ and ‘Other (least selective)’.

²⁴ Jack Britton and others, [‘How much does it pay to get good grades at university?’](#), 2022. Published on IFS.ORG.UK.

²⁵ Jack Britton and others, [‘How much does it pay to get good grades at university?’](#), 2022. Published on IFS.ORG.UK.

It is worth noting that the earnings premium for different degree classifications may vary by subject. Britton and others (2022) found that men and women who graduated with a 2.2 degree in law or economics earned on average 15% less than those with a 2.1 degree in the same subject. However, the authors did not find a significant difference in earnings across degree classifications for those studying education or English.²⁶ Overall, subjects with a high labour market return tend to have high degree class premiums.

They also found that the earnings premium for different degree classifications also varies by type of university. Achieving at least a 2.1 degree is associated with relatively higher earnings at more selective universities. Whereas, those who attend the least selective universities earn around 6% less for women and 8% less for men on average at age 30 if they get a 2.2 degree compared to a 2.1 degree. This difference rises to 20% for those from the more selective universities.²⁷

Additionally, there are large gender differences in the earnings premium from obtaining a first from the 'most selective' group of universities.²⁸ At these universities there is almost no difference in the average earnings premium associated with getting a first-class degree compared to a 2.1 degree for women, but there is an estimated earnings premium of around 14% for men.

²⁶ Jack Britton and others, '[How much does it pay to get good grades at university?](#)', 2022. Published on IFS.ORG.UK.

²⁷ Jack Britton and others, '[How much does it pay to get good grades at university?](#)', 2022. Published on IFS.ORG.UK.

²⁸ Jack Britton and others, '[How much does it pay to get good grades at university?](#)', 2022. Published on IFS.ORG.UK.

How do returns vary by institution?

Examples of which universities are in which groups:

- **Most selective:** University of Oxford, University of Cambridge, The London School of Economics and Political Science, and Imperial College London²⁹
- **The ‘Russell Group’ includes:** University of Glasgow, University of Birmingham, University of Warwick, Durham University, and University of Edinburgh
- **The ‘pre-1992 universities’ group includes:** University of St Andrews, Brunel University London, University of Bath, Loughborough University, University of Sussex, University of Hull
- **The ‘post-1992 universities’ group includes:** Anglia Ruskin University, Bath Spa University, De Montfort University, Teesside University, Oxford Brookes University
- **The ‘other universities’ group includes:** Leeds Trinity University, Newman University, Liverpool Hope University

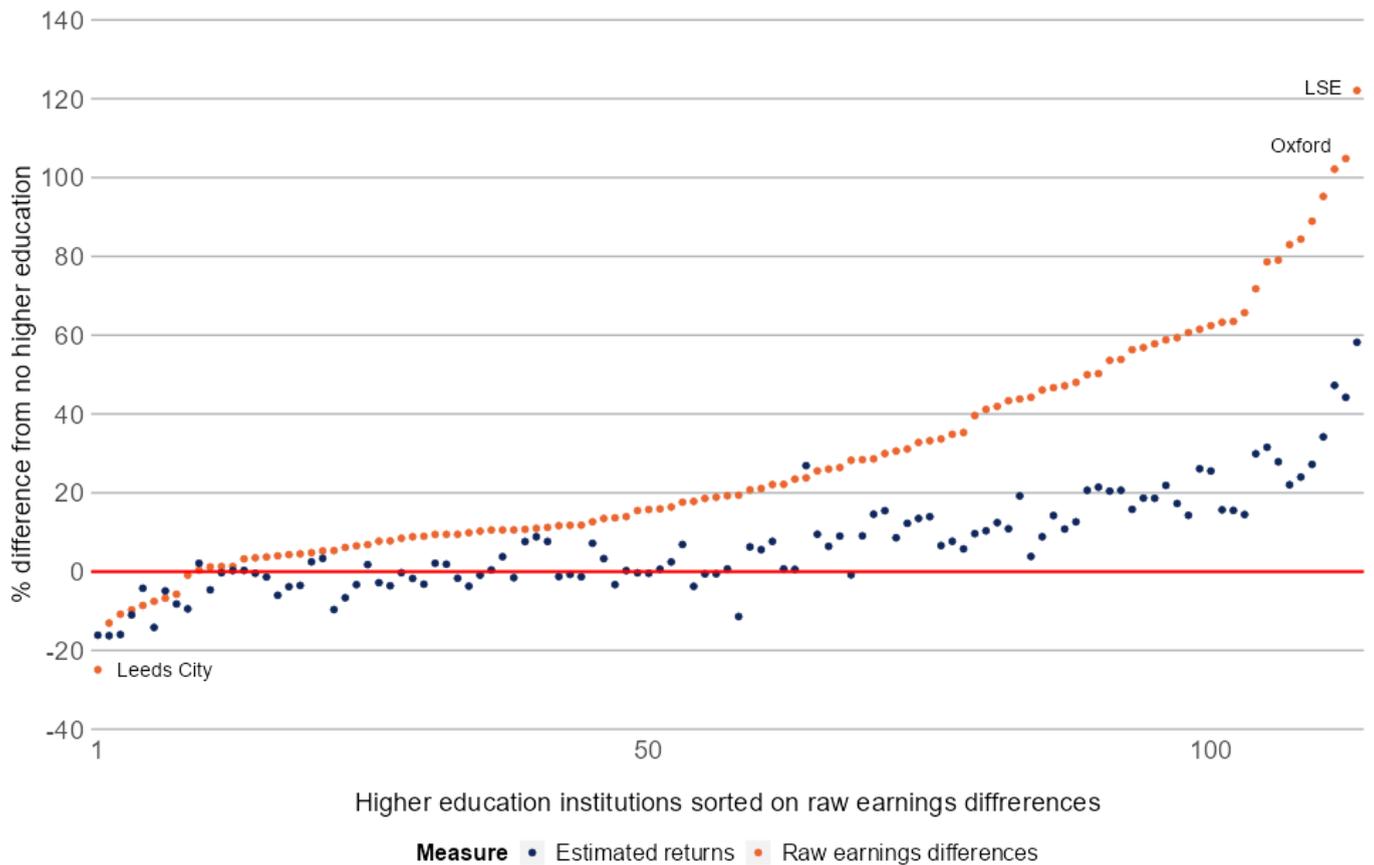
A person’s future earnings may vary by the university attended. Figure 3 contains the estimates of average earnings and value-add (referred to as ‘estimated returns’ in the chart) in earnings for men by university.³⁰ On average, the London School of Economics and Political Science (LSE) and the University of Oxford have the highest average earnings for men at the age of 29, with around 100 to 120% higher earnings than the average man who did not attend HE. Leeds City University has the lowest percentage difference, with around 20% lower average earnings than the average man who did not attend HE.

²⁹ These are also Russell Group universities, but in some studies have been treated independently from the Russell Group due to their highly selective entry requirements and difference in earnings outcomes.

³⁰ Chris Belfield and others, ‘[The impact of undergraduate degrees on early-career earnings](#)’, 2018. Published on GOV.UK.

Figure 3: Raw earnings differences and estimated returns at age 29 by higher education institution (HEI), for men.

Estimated percentage difference in raw earnings and value-add earnings returns at age 29, compared to men who do not attend HE. Based on 2002 to 2007 GCSE cohorts.



Source: Belfield and others (IFS), [‘The impact of undergraduate degrees on early-career earnings’](#), 2018b. Figure 22.

Note: The red line represents the average earnings of a man who did not attend HE. HE = higher education, HEI = higher education institution. Raw earnings differences only account for the age at which someone started their course. Estimated returns account for age, background and prior attainment. The HEIs are ranked on raw earnings differences.

However, once individual and background characteristics are accounted for, the estimated value-add in earnings tends to fall. The estimates in value-add in earnings on average for men at age 29 range from -16% at Falmouth University to 58% at LSE. Overall, the average man attends a university with a 10% value-add in earnings relative to those who do not attend HE.³¹

Figure 4 shows the estimates of average earnings and value-add in earnings by university for women.³² The universities with the highest average earnings for women at the age of 29 are LSE and Imperial College London at around 180% and 150% respectively, compared to those who did not attend HE. Bolton University has the lowest average earnings relative to the average woman who did not attend HE, at around 10% lower. Once individual and background characteristics are accounted for, the authors find the estimated value-add in earnings also tends to fall. For women, value-add in earnings on average at age 29 ranges from -11% at Bolton University to 94% at LSE. Overall, the authors estimate that the average woman attends a university with a value-add in earnings of 24%.³³

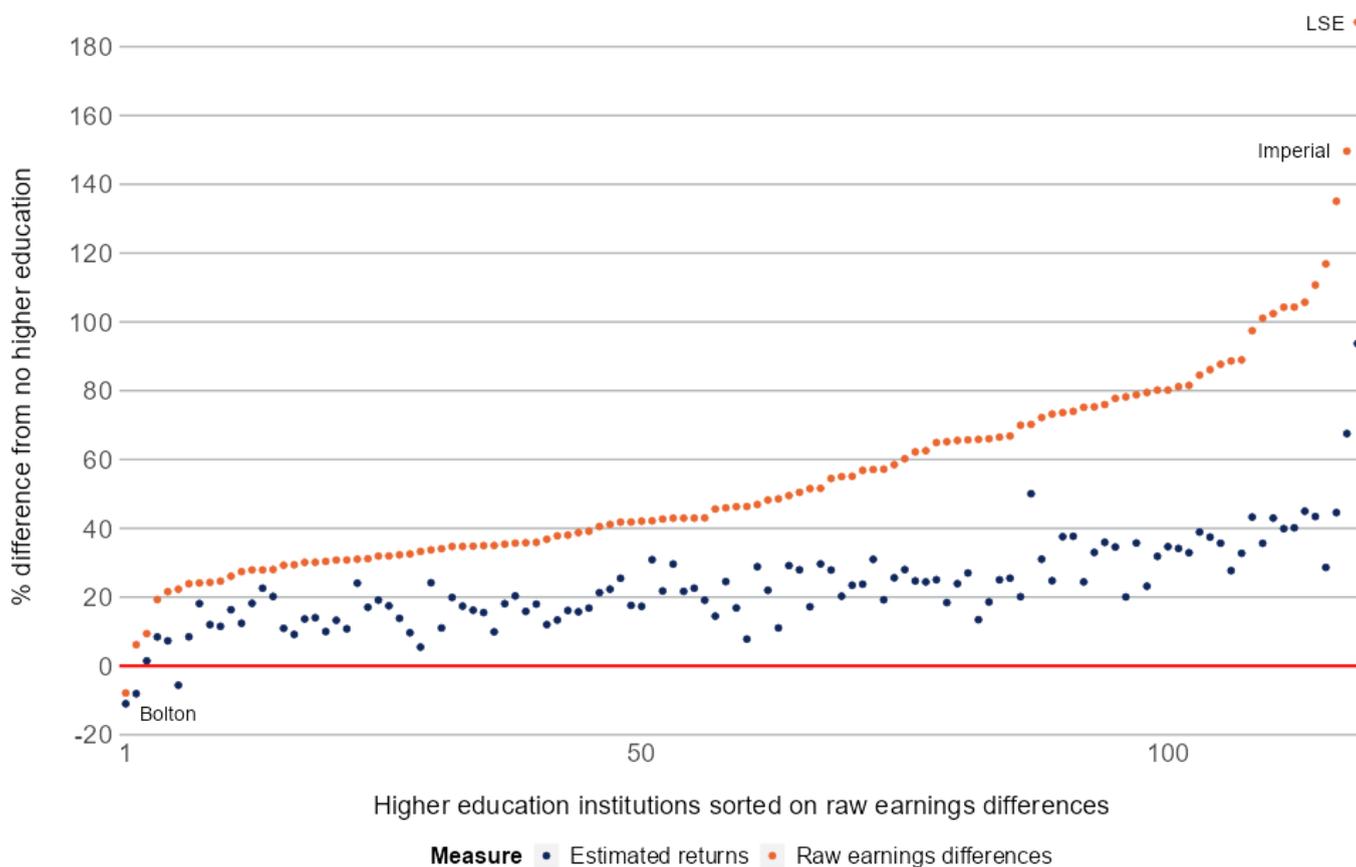
³¹ Defined as 'median man' in the Department for Education, Institute for Fiscal Studies, and Chris Belfield and others. '[The impact of undergraduate degrees on early-career earnings](#)', 2018. Published on GOV.UK.

³² Department for Education, Institute for Fiscal Studies, and Chris Belfield and others. '[The impact of undergraduate degrees on early-career earnings](#)', 2018. Published on GOV.UK.

³³ Defined as 'median woman' in the Department for Education, Institute for Fiscal Studies, and Chris Belfield and others, '[The impact of undergraduate degrees on early-career earnings](#)', 2018. Published on GOV.UK.

Figure 4: Raw earnings differences and estimated returns at age 29 by HEI, for women.

Estimated percentage difference in raw earnings and value-add at age 29, compared to women who do not attend HE. Based on 2002 to 2007 GCSE cohorts.



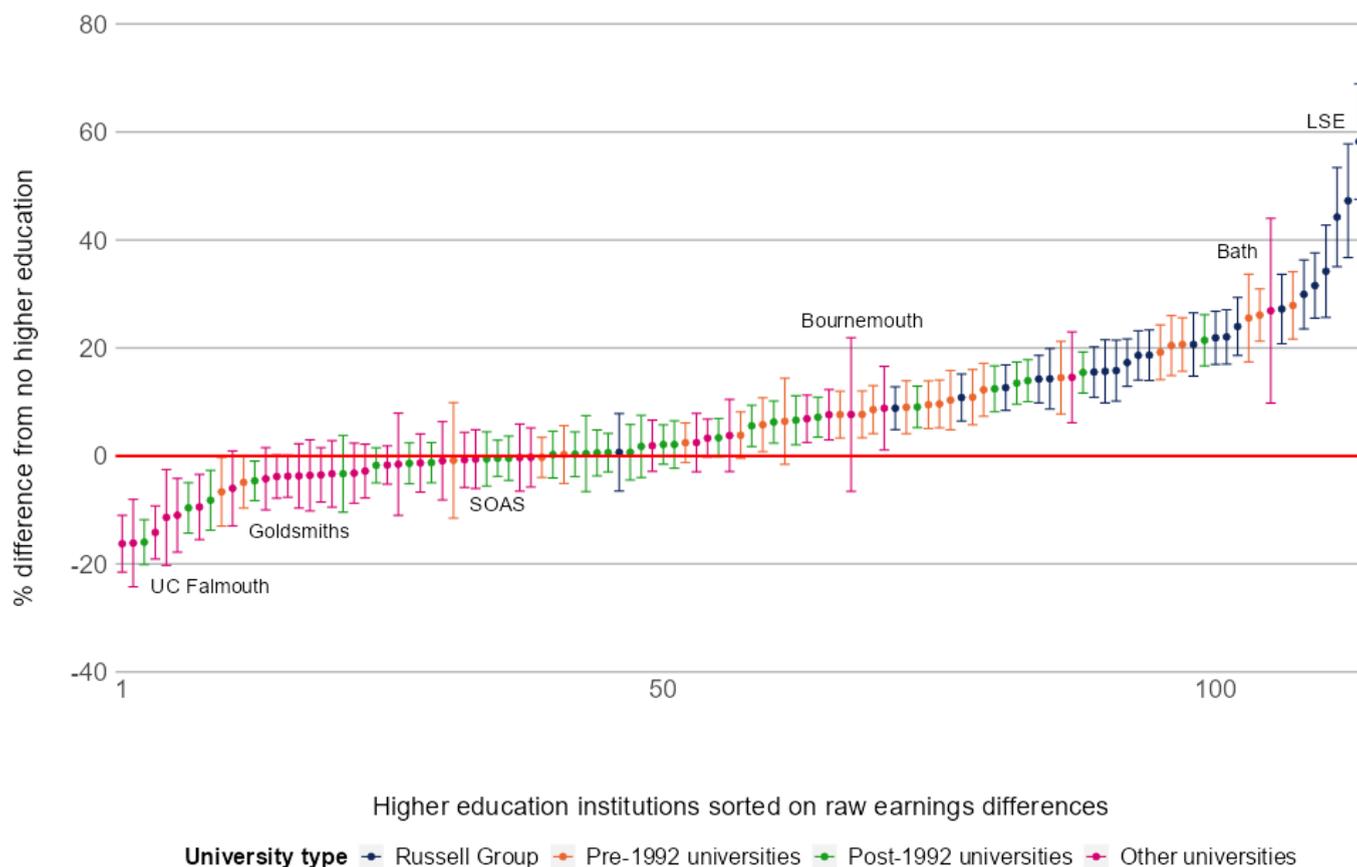
Source: Belfield and others (IFS), [‘The impact of undergraduate degrees on early-career earnings’](#), 2018b. Figure 23.

Note: The red line represents the average earnings of a woman who did not attend HE. Raw earnings differences only account for the age at which one stated their course. Estimated returns account for age, background and prior attainment. The HEIs are sorted on raw earnings differences.

However, we urge the reader to treat these figures with caution as they are only based on the average of the 2002 to 2007 GCSE cohorts and the earnings prospects of current and future students at these universities may have since changed.

Figure 5: Estimated returns at age 29 by HEI, for men.

Percentage value-add in earnings for men aged 29, by institution attended and university type. Based on 2002 to 2007 GCSE cohorts, conditional on being in sustained employment, and controlling for age, background and prior attainment.

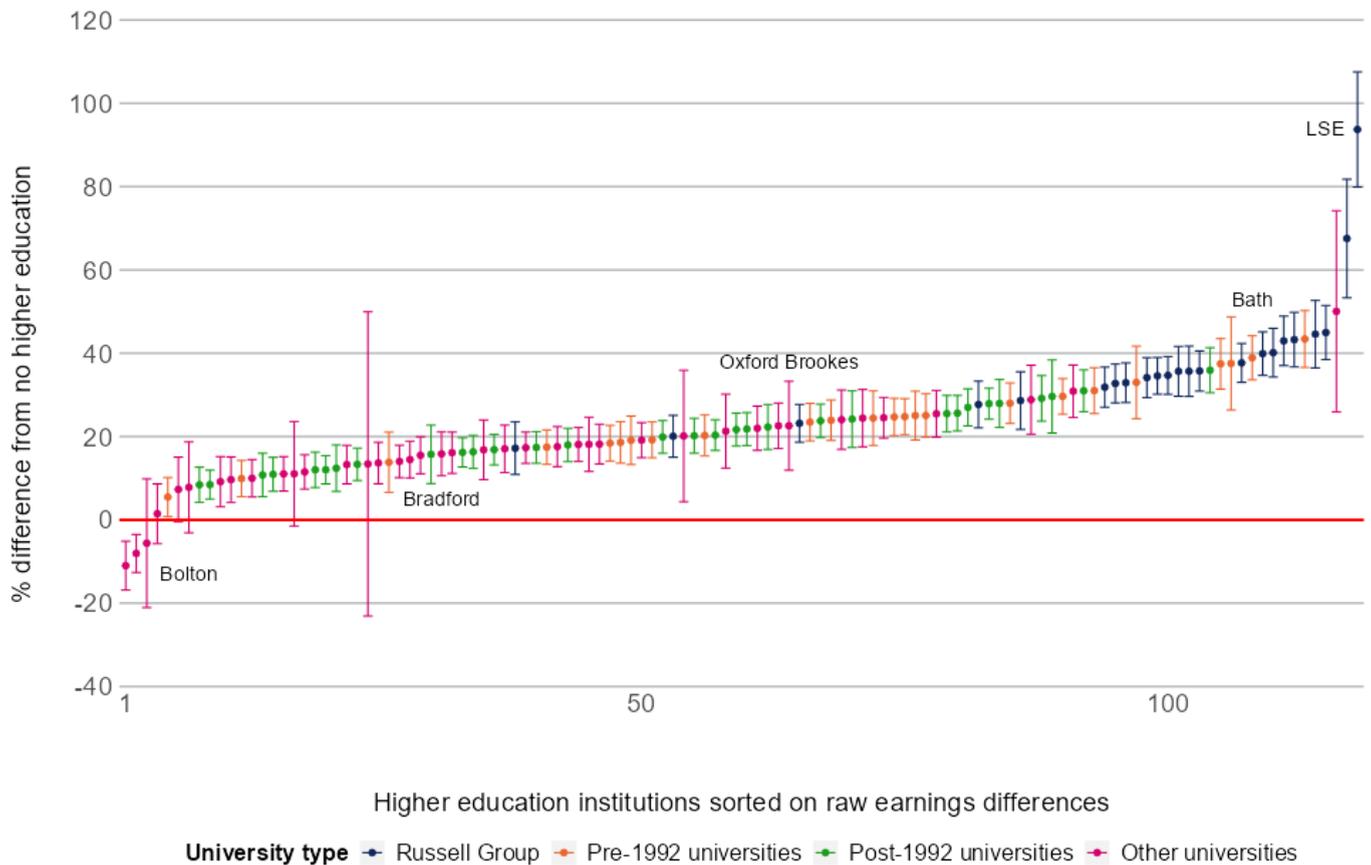


Source: Belfield and others. (IFS), [‘The impact of undergraduate degrees on early-career earnings’](#), 2018b. Figure 24.

Note: The red line represents the average earnings of a man who did not attend HE. The dot for each university represents the estimated value-add. The top and bottom of the lines for each university represent the 95% confidence intervals of the value-add estimate. Estimated returns control for age, background and prior attainment. The HEIs are ranked on estimated returns.

Figure 6: Estimated returns at age 29 by HEI, for women.

Percentage value-add in earnings for women aged 29, by institution attended and university type. Based on 2002 to 2007 GCSE cohorts, conditional on being in sustained employment, and controlling for age, background and prior attainment.



Source: Belfield and others (IFS), [‘The impact of undergraduate degrees on early-career earnings’](#), 2018b. Figure 25.

Note: The red line represents the average earnings of a woman who did not attend HE. The dot for each university represents the estimated value-add. The top and bottom of the lines for each university represent the 95% confidence intervals of the value-add estimate. Estimated returns control for age, background and prior attainment.

Figures 5 and 6 provide a breakdown of value-add in earnings by university type for men and women respectively.³⁴ Overall, the evidence reviewed finds that universities in the Russell Group typically have a higher value-add in earnings than those not in the Russell Group, with some exceptions.³⁵ However, a key question for social mobility is whether disadvantaged young people have sufficient access to study at these universities in order to achieve the high average and value-add in earnings observed. Britton and others (2021) shed some light on this question by looking at both access and earnings outcomes for students from disadvantaged backgrounds. Using data from the 2002 to 2004 GCSE cohorts, they found that although the Russell Group universities typically have strong earnings outcomes, they tend to admit few students who have been eligible for free school meals (FSM).³⁶ At the least selective universities, 20 to 30% of students were FSM-eligible at age 16. However, this falls to below 2% on average in the 10 most selective universities. Apart from Queen Mary University of London, all Russell Group universities were estimated to have access rates at or below the national average (Britton and others, 2021).³⁷

At the 'most selective' Russell Group universities, 44% of students were privately educated, but make up only 7% of the overall population.^{38 39} Overall, privately educated students are around 50 times more likely to attend one of these 4 universities, and nearly 100 times more likely to go to the University of Oxford or University of Cambridge than pupils who were eligible for FSM. However, a brief look at more recent data from the Higher Education Statistics Agency (HESA)

³⁴ Reproduced from the Department for Education, Institute for Fiscal Studies, and Chris Belfield and others, '[The impact of undergraduate degrees on early-career earnings](#)', 2018. Published on [GOV.UK](#).

³⁵ The report does not provide an average value-add figure by university type for all students, but provides some breakdowns by level of prior attainment. As there are many categories these could be split by we do not include them in this review. An example of the breakdown provided suggests an estimated value-add of 20.6% for low prior attainment for men who attended a Russell Group university, relative to 7% for men with a low prior attainment who went to a post-1992 university.

³⁶ A successful earnings outcome is defined as making it into the top 20% of earners in Jack Britton and others, '[Which university degrees are best for intergenerational mobility?](#)', 2021. Published on [IFS.ORG.UK](#).

³⁷ Jack Britton and others, '[Which university degrees are best for intergenerational mobility?](#)', 2021. Published on [IFS.ORG.UK](#).

³⁸ The authors defined this group as: University of Oxford, University of Cambridge University, London School of Economics and Political Science and Imperial College London.

³⁹ Jack Britton and others, '[Which university degrees are best for intergenerational mobility?](#)', 2021. Published on [IFS.ORG.UK](#).

suggests the proportion of pupils not from state schools at the ‘most selective’ universities might have decreased.⁴⁰

This may have social mobility implications because the ‘most selective’ institutions were also found to have the best chances of getting poorer students into the top 20% of earners, even though relatively few are admitted into these universities. Success, according to Britton and others (2021) is defined as making it into the top 20% of the earnings distribution.⁴¹ In terms of labour market outcomes for poorer students, all Russell Group universities have ‘success’ rates above the average, and 5 institutions – the 4 ‘most selective’ Russell Group universities as well as the Royal Veterinary College – have ‘success’ rates of more than 50%.⁴² This means that more than half of their students from poorer backgrounds make it to the top 20% of the earnings distribution. The probability of a student making it to the top 20% of the earnings distribution by university type is illustrated in Figure 7.⁴³

Although more disadvantaged pupils may now be attending the more selective universities, it might be too early to observe their earnings outcomes in the data. This is because we would need to wait until they are around 30 years old to make comparisons similar to the papers we have reviewed.

⁴⁰ Taking a rough average of University of Oxford, University of Cambridge University, London School of Economics and Political Science and Imperial College London shows an average of 31.5% of students were not from state schools. However this is only a rough estimate we have done using HESA data for 2020 to 2021 from [Table T1](#). Furthermore, this average is not weighted by student numbers at each university.

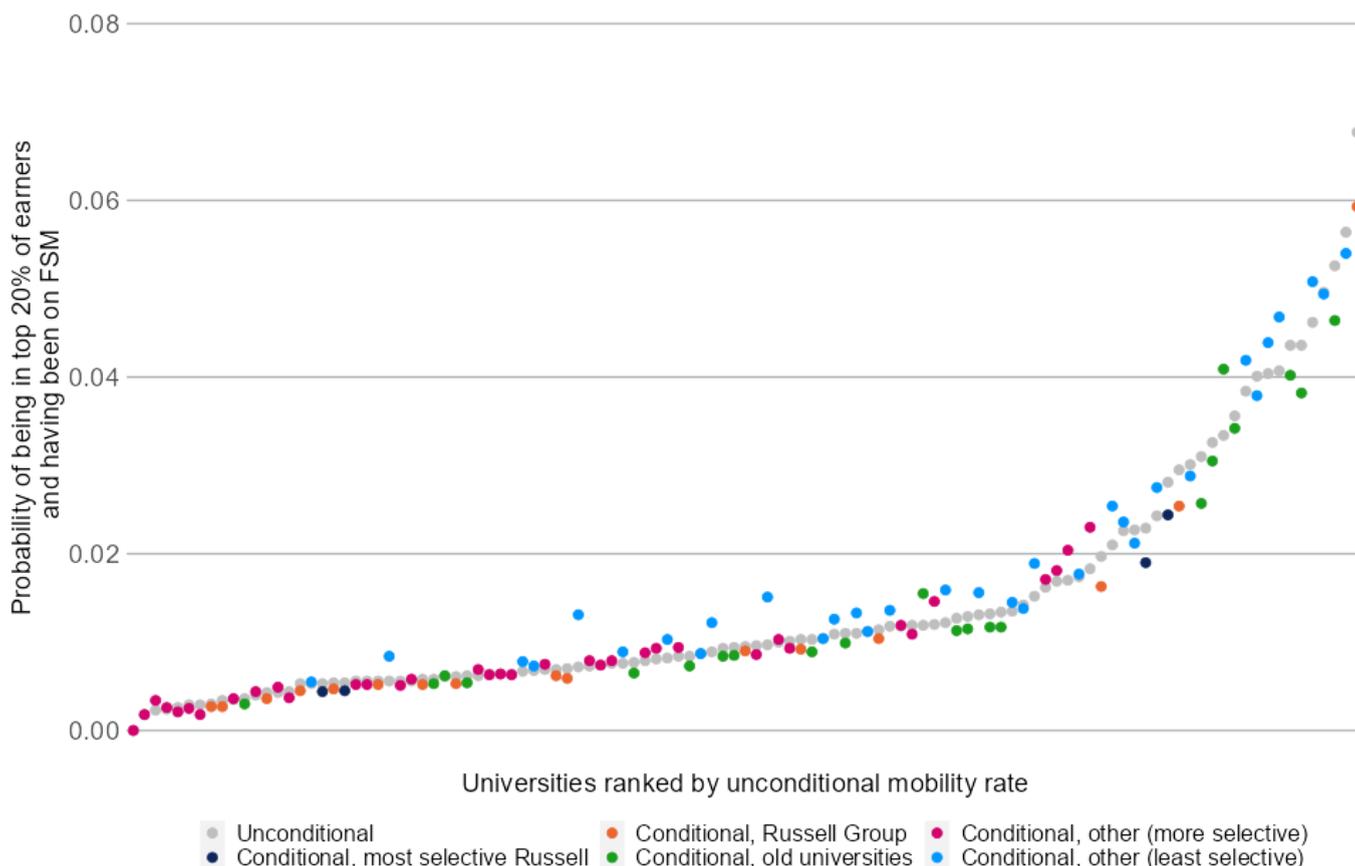
⁴¹ Jack Britton and others, [‘Which university degrees are best for intergenerational mobility?’](#), 2021. Published on [IFS.ORG.UK](#).

⁴² Defined as getting a student into the top 20% of earners.

⁴³ Reproduced from Jack Britton and others, [‘Which university degrees are best for intergenerational mobility?’](#), 2021. Published on IFS.ORG.UK.

Figure 7: Conditional mobility rates by university.

Conditional mobility rates are calculated by multiplying conditional ‘success’ rates by ‘access’ rates for each university, split by university type. ‘Success’ is defined as the probability of being in the top 20% of earners at age 30 conditional and ‘access’ is defined as having been free school meal (FSM) eligible at age 16.



Source: Britton and others (IFS), [‘Which university degrees are best for intergenerational mobility?’](#), 2021, Figure 19.

Note: Conditional ‘success’ rates here mean that factors such as prior attainment and other background characteristics were controlled for. ‘Most selective Russell Group’ contains University of Oxford University, University of Cambridge University, London School of Economics and Political Science and Imperial College London. ‘Russell Group’ consists of all other Russell Group universities. ‘Old universities’ consists of the remaining universities which gained status prior to 1992 (often referred to as ‘pre-1992’ universities). The remaining universities are split into equal-sized groups according to the average key stage 4 score of students, these are ‘Other (more selective)’ and ‘Other (least selective)’. The full list of universities and their groups are published in the online appendix for the paper. The sample

consists of universities with at least 250 students and 6 who were eligible for FSM. Negative conditional mobility rates are set to zero.

Overall, the evidence suggests that going to university (particularly one from the Russell Group) may increase social mobility. Britton and others (2021) find a strong positive relationship between an individual's family background and earnings at age 30.^{44 45} However, this relationship becomes weaker for those who went to university. This may suggest that although those from disadvantaged backgrounds tend to earn less than their wealthier peers, disadvantaged pupils who attend highly selective universities are more likely than other disadvantaged students to overcome their initial disadvantage in earnings potential.

This is illustrated in Figure 8.⁴⁶ In this chart, the flatter the curve, the less there is an association between someone's background and someone's earnings. As the curves for all university types are flatter than the national average (the grey curve), this suggests that going to university is associated with an improvement in social mobility when looking at earnings outcomes.

Figure 8 shows that the gap in the average earnings rank between the least deprived state-educated students and those who were FSM-eligible is around 20 percentiles.⁴⁷ This is reduced to around 10 percentiles for those who went to university. For the least selective universities, Russell Group universities, non-Russell Group old universities and other selective universities this gap is around 10 percentiles. However, for the most selective Russell Group universities there is almost no gap.

⁴⁴ Measured in earnings rank.

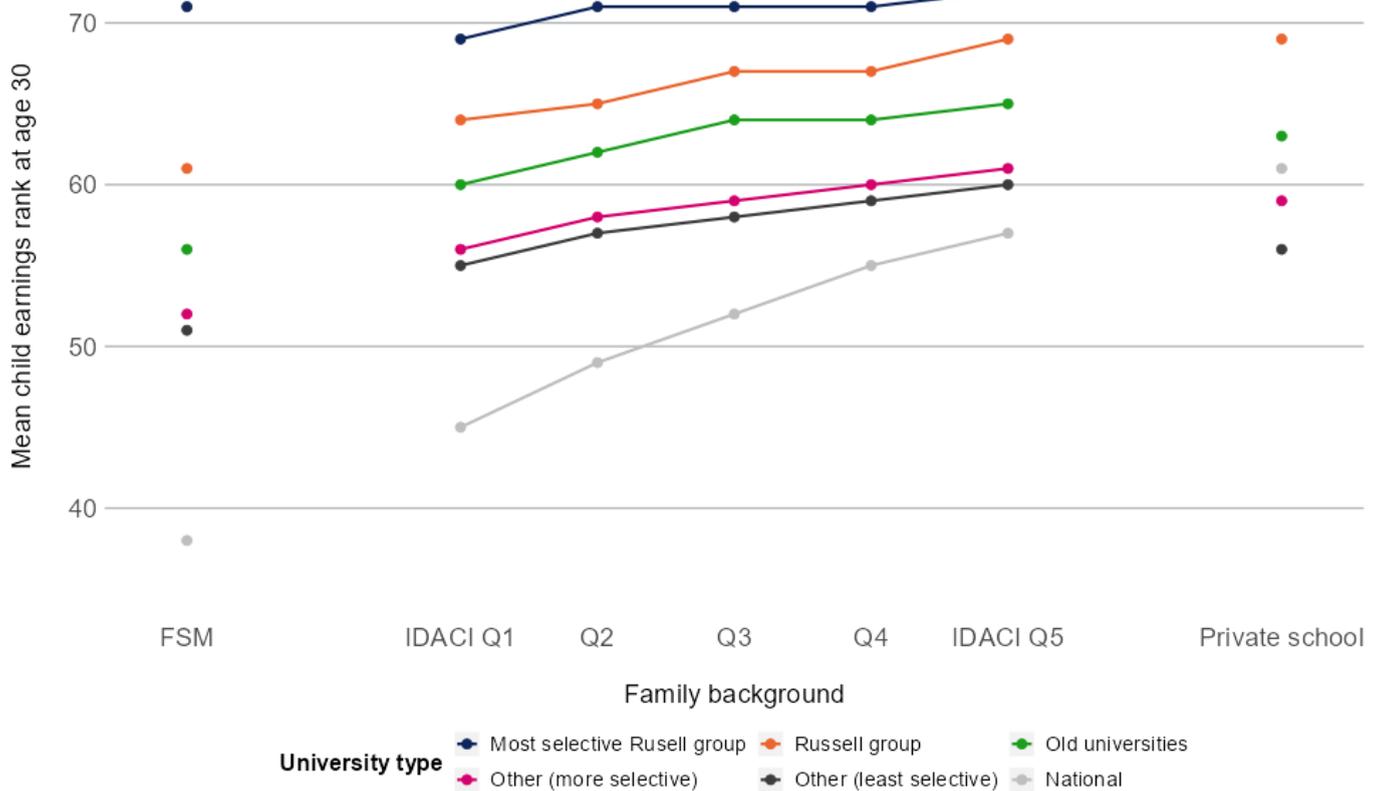
⁴⁵ Jack Britton and others, '[Which university degrees are best for intergenerational mobility?](#)', 2021. Published on [IFS.ORG.UK](#).

⁴⁶ Footnote reproduced from Jack Britton and others, '[Which university degrees are best for intergenerational mobility?](#)', 2021. Published on [IFS.ORG.UK](#).

⁴⁷ To interpret earnings rank, consider taking a group of people and their earnings. Rank them in order from lowest to highest and convert this into percentiles such that the top 1% of earners are the 99th percentile and the bottom 10% of earners are the 10th percentile. Once this has been done, the study finds that the difference between the average earnings percentile of those who were eligible for free school meals (FSM) and those who were not eligible is around 20 percentiles. In the chart, the national average rank of those who were FSM-eligible is just under the 40 percentile, relative to just under the 60th percentile for those from the least deprived (IDACI Q5) backgrounds.

Figure 8: Dependence between family background and child earnings rank at age 30.

Mean child earnings rank at age 30, by the income deprivation affecting children index (IDACI) quintile and university type, for the 2002 to 2004 GCSE cohorts.



Source: Britton and others (IFS), [‘Which university degrees are best for intergenerational mobility?’](#), 2021, Figure 8.

Note: Income Deprivation Affecting Children Index = IDACI. IDACI is a measure of the proportion of children between the ages of 0 and 15 who live in income-deprived households. IDACI quintiles are defined based on the state-school students who are not eligible for FSM. ‘Most selective Russell Group’ contains Oxford, Cambridge, Imperial College and London School of Economics universities. ‘Russell Group’ consists of all other Russell Group universities. ‘Old universities’ consists of the remaining universities which gained status prior to 1992 (often referred to as ‘pre-1992’ universities). The remaining universities are split into equal-sized groups according to the average KS4 score of students, these are ‘Other (more selective)’ and ‘Other (least selective)’. The full list of universities and their groups are published in the online appendix for the paper.

These findings suggest that FSM-eligible pupils who are able to attend the most selective universities may be able to overcome almost all of their disadvantage in earnings potential. FSM-eligible pupils who attend any university on average may be able to halve their disadvantage in earnings potential. However, the authors note the evidence is only ‘suggestive’ of this and they cannot rule out that the decline in the gap is due to other factors related to the type of disadvantaged person who attends university. For example, if disadvantaged pupils were relatively more motivated to earn more than their relatively wealthier peers, even if the university education did not provide any additional earnings potential, we might still observe a reduction in the gap.

Other more selective universities have higher ‘success’ rates compared to ‘other universities’. This means disadvantaged pupils who attended these selective universities were more likely to end up in the top 20% of earners by age 30. Unsurprisingly, selective universities also typically have higher-earning graduates overall, and typically take on the highest ability students.⁴⁸ (Belfield and others, 2018b).

Overall, Britton and others (2021) do not find a correlation between the estimated returns of universities and their estimated mobility rates.⁴⁹ Although, they find that the best-performing universities admitted relatively few disadvantaged students. Whereas, the universities with the highest access rates of disadvantaged students had below-average ‘success’ rates in earnings.

Britton and others (2021) estimate a benchmark mobility rate for all universities of 4.4%.⁵⁰ This represents the rate if there were “equal access to university for all income groups and undergraduates from all income backgrounds had the same chance of making it into the top 20%”. The benchmark mobility rate is calculated by taking the share of pupils eligible for FSM and multiplying it by the share of graduates in the top 20% of earnings. However, the authors only find an average mobility rate of 1.3% across all universities. This implies that at age 30, only 1.3 in every 100 graduates from a disadvantaged background are in the top 20% compared to their benchmark of 4.4 for every 100 graduates.

⁴⁸ Chris Belfield and others, [‘The impact of undergraduate degrees on early-career earnings’](#), 2018. Published on GOV.UK.

⁴⁹ Jack Britton and others, [‘Which university degrees are best for intergenerational mobility?’](#), 2021. Published on IFS.ORG.UK.

⁵⁰ Jack Britton and others, [‘Which university degrees are best for intergenerational mobility?How much does degree choice matter?’](#), 2021. Published on IFS.ORG.UK.

Do these selective institutions actually provide skills and knowledge which enable their graduates to earn more than if they had gone to a less selective university? Or do they earn more because employers believe getting into selective universities is a signal of a high ability prior to beginning university? The former concerns what economists refer to as ‘human capital theory’ and the latter is referred to as ‘signalling’. At the time of this review, we are not aware of any literature examining whether higher earnings associated with attending university were due to signalling or an increase in human capital in the UK. However, a recent study from Norway suggests that 30% of increased earnings from studying a degree are due to signalling, while the remaining 70% is due to an improvement in human capital (in other words, our skill level makes us more productive).⁵¹

Studies based in the UK and US have not come to a conclusion on the composition of earnings returns from higher education.⁵² They find some evidence that being more educated does improve skills, but do not rule out that signalling plays a role in earnings. When interpreting the literature on earnings returns, one limitation is that we cannot isolate why more selective universities lead to higher returns.

Summary

- On average, people who go to university earn more than those who do not.
- On average, a higher degree class is linked to higher earnings. People who get a first earn more than those with a 2.1, and those with a 2.2 or lower earn less.
- While Russell Group universities tend to have the highest value-add in earnings, most of these universities have lower than average access rates for disadvantaged students. The evidence suggests that going to university (particularly Russell Group) may increase social mobility in terms of earnings. If disadvantaged students are less likely to be able to access more selective universities, this may have social mobility implications.

⁵¹ Gaurab Aryal and others, ‘[Signalling and employer learning with instruments](#)’, 2022. Published on AEAWEBSITE.ORG.

⁵² Gill Wyness and others, ‘[Does education raise people’s productivity or does it just signal their existing ability?](#)’, 2021. Published on CENTRE FOR EDUCATION POLICY AND EQUALISING OPPORTUNITIES UCL.AC.UK.

Access to university and return in earnings: an exploratory approach

Although FSM status is a useful proxy for SEB, we are also interested in exploring how other measures of access to university are related to the return on earnings.

To explore this further, we have conducted some initial experimental analysis using 2 widening participation benchmarks published by the Higher Education Statistics Agency (HESA).⁵³ In this analysis we look at the correlation between the HESA benchmarks and earnings returns by university.

The first HESA benchmark we consider is the state-school pupil benchmark, which is an estimate of what proportion of students at a university should be from state schools if – after accounting for grades – they had an equal chance of attending university as non-state-schooled pupils. Each university has its benchmark which HESA calculates using university factors such as subject and entry profiles.⁵⁴ Although HESA also publishes a location adjusted benchmark for state-schooled pupils, we use the original benchmark. This is because the location adjusted benchmark is published for fewer universities. However, in the future it may be interesting to extend this analysis to look at the location-adjusted benchmark.

The second benchmark we consider is the POLAR4 benchmark by HESA.⁵⁵ This is similar to the state-school benchmark, but estimates the proportion of pupils from a low HE participation neighbourhood who would be attending each university if they had equal chances as those from

⁵³ Both benchmarks are from Table T1 in HESA's widening participation performance measures. Higher Education Statistics Agency, '[Widening participation: UK performance indicators 2020/21](#)', 2022. Published on HESA.AC.UK.

⁵⁴ The Higher Education Statistics Agency's own technical guidance contains more information on how the benchmarks are calculated. See, '[Benchmarks \(applicable to tables T1 to T3, T7 and E1\)](#)'. Published on HESA.AC.UK.

⁵⁵ According to HESA: "The POLAR4 classification is formed by ranking 5 groups from quintile 1 areas, with the lowest young participation (most disadvantaged), up to quintile 5 areas with the highest rates (most advantaged), each representing 20% of the UK young cohort. Students have been allocated to the neighbourhoods on the basis of their postcode. Those students whose postcode falls within middle layer super output areas with the lowest participation (quintile 1) are denoted as being from a low participation neighbourhood."

wealthier neighbourhoods.⁵⁶ As with the state-school benchmark, each university is assigned their own POLAR4 participation benchmark by HESA.

For each of these benchmarks we take the gap between the actual proportion of students from either a state school or POLAR4 background and the benchmark. A positive gap indicates the university has a disproportionately higher number of students from the background captured by the benchmark. A negative gap indicates that the university has a disproportionately lower number than the benchmark.

These findings are based on our initial analysis only and this is something we may want to develop further in the future.

Analysis of the Higher Education Statistics Agency's state school benchmark

Russell Group universities tend to have a lower proportion of state-school pupils than their HESA benchmark by a mean of 4.9 percentage points. However, the post-1992 universities tend to have a higher proportion of state-school pupils than their benchmark by a mean of 1.8 percentage points. Pre-1992 universities also have a slightly higher proportion of state-school pupils than their benchmark by a mean of 0.6 percentage points. The remaining universities, which are grouped as 'other universities', have a mean gap that is essentially zero (0.03 percentage points).

To reduce the influence of outliers we also look at the median, which shows a similar trend across most university types.⁵⁷ The median benchmark gap for universities from the Russell Group is 1.9 percentage points below their benchmark (relative to a mean of 4.9 percentage points below their benchmark). The median gaps for the post-1992 and pre-1992 university groups are also higher than the means with 2.7 and 1.8 percentage points above their

⁵⁶ For more detail on POLAR4 and how it is calculated see Office for Students, '[Young participation by area](#)'. Published on OFFICEFORSTUDENTS.ORG.UK. HESA also provides a description of their use of definitions including POLAR4. HESA, '[Definitions and benchmark factors](#)'. Published on HESA.AC.UK.

⁵⁷ Outliers are values which are further away from most of the other values in a dataset. It is common practice in statistical analysis to check for outliers and either remove them from the sample or use a methodology to limit their influence. This is done to prevent a small number of observations from having a disproportionately large influence on the final result.

benchmark respectively. However, the median for 'other universities' is 2.5 percentage points above their benchmark. This indicates that the near-zero mean benchmark gap for 'other universities' is likely driven by outliers rather than an overall representation of the university group.

There is a lot of variation in the size of the gap across all universities. The largest gap between the proportion of those from a state-school background and the benchmark is at the Royal Agricultural University with 24 percentage points less than its benchmark. The institution with the highest proportion of students from a state-school background relative to its benchmark is Writtle University College, with 7.8 percentage points above the benchmark. Both these institutions are classed as 'other universities'.

There is also a lot of variation among universities within each university group. Within the Russell Group universities, Queen Mary University of London and the University of Sheffield have the highest proportion of state-schooled students compared to their gap with 4.6 and 2.6 percentage points above their benchmark respectively. Within the Russell Group, Durham University, the University of Exeter and the University of Edinburgh have the lowest proportion of state-school students – between 16 and 17 percentage points below their benchmark gap.

Within the post-1992 group of universities there is also a lot of variation. The University of Huddersfield has the highest proportion of state-schooled students above its benchmark with 4.2 percentage points. Only two post-1992 universities have a lower proportion of state-schooled students than their benchmark: Oxford Brookes University with 20.9 percentage points below its benchmark and Nottingham Trent University with only 0.2 percentage points below its benchmark. hesa

Relationship between average earnings by university and Higher Education Statistics Agency state-school benchmark

To understand more about how average earnings and value-add in earnings of universities are correlated to their performance on their HESA state-school benchmark, we fit simple linear regression models. However, the only purpose of these linear regression models is to understand the relationship and we do not imply or suggest a causal link. To do so would require much more extensive analysis including an effort to control for confounding factors.

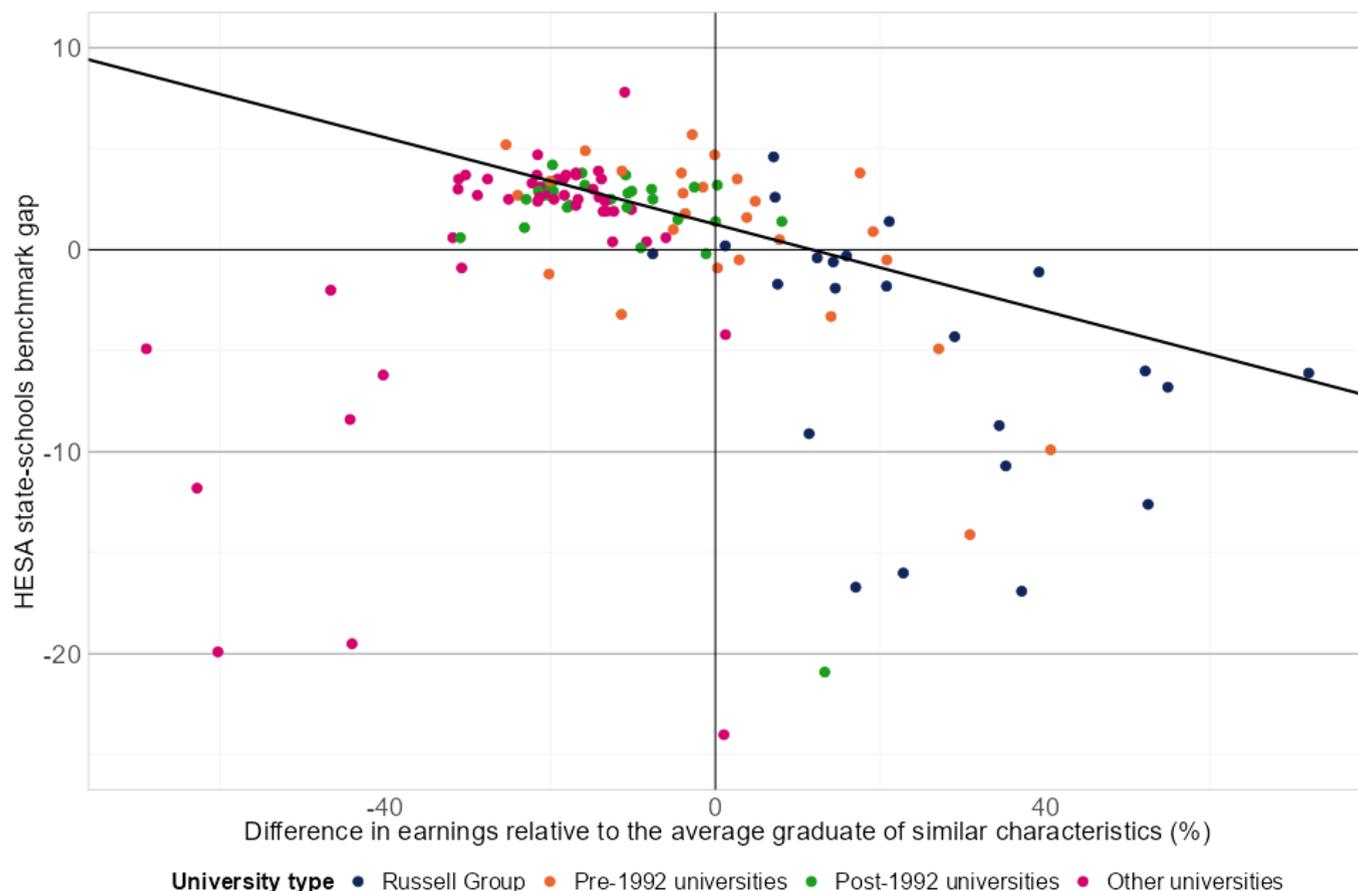
Instead we are interested in understanding how earnings returns and accessibility are distributed. To limit the influence of outliers, we adopt a simple rule in which any universities with a benchmark gap of an absolute value of greater than 10 percentage points are removed from the sample. We similarly drop universities with an absolute value of value-add relative to the average degree of greater than 20 percentage points for the value-add analysis. We use the same threshold of an absolute value of 20 percentage points for the average earnings analysis. The choice and robustness of using these thresholds is something we may want to improve on in future analysis.

In Figure 9 we show a plot of the average earnings by university (without controlling for other factors) and their HESA state-school benchmark gap for men. The line represents the regression line (also known as the line of best fit) of average earnings on the state-school benchmark gap, based on the sample excluding outliers. We have included the outliers in the plot to provide a more detailed picture of how returns and the benchmark gap are distributed. On average, for each percentage increase in men's average earnings at a university relative to the average degree, there is a 0.1 percentage point fall in the university's corresponding HESA state-school benchmark gap. So, on average, returns for men are slightly negatively correlated to the accessibility of state-school students at university level.

In Figure 10 we show the equivalent plot for women's average earnings. It is worth noting that there is only one HESA state-school benchmark gap and this is for all students and therefore not gender specific. The line of best fit shows a slight negative correlation between the average earnings for women and performance on their HESA state-school benchmark. The findings are very similar to those for men, with an average of a 0.1 percentage point fall in a university's corresponding state-school benchmark gap being associated with a percentage point increase in the average earnings of women relative to the average degree.

Figure 9: Relationship between the HESA benchmark and raw earnings by university type for men.

HESA benchmark gap in access to state-school pupils (negative implies underperformance) by the average men's raw earnings for each university type.

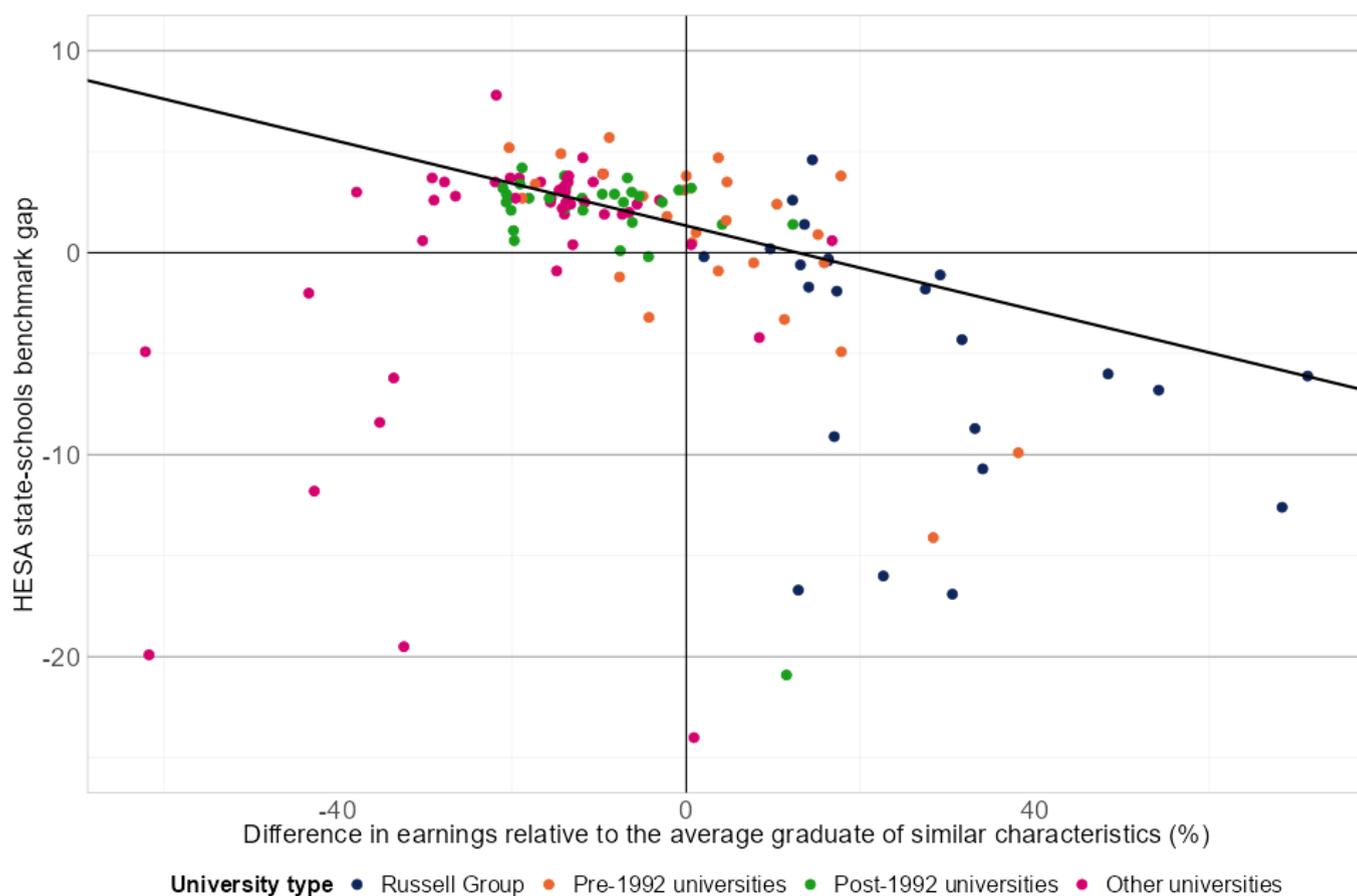


Source: Data from HESA widening participation table T1 for academic year 2020 to 2021 and Belfield and others (IFS), 'The impact of undergraduate degrees on early-career earnings', 2018b, based on the 2002 to 2007 GCSE cohorts. Analysis done by SMC.

Note: Outliers are included in the plot, the regression line is based on the sample excluding outliers.

Figure 10: Relationship between the HESA benchmark and raw earnings by university type for women.

HESA benchmark gap in access to state-school pupils (negative implies underperformance) by the average women's raw earnings for each university type.



Source: Data from HESA widening participation table T1 for academic year 2020 to 2021 and Belfield and others (IFS), 'The impact of undergraduate degrees on early-career earnings', 2018b, based on the 2002 to 2007 GCSE cohorts. Analysis done by SMC.

Note: Outliers are included in the plot, the regression line is based on the sample excluding outliers.

Relationship between value-add by university and Higher Education Statistics Agency's state-school benchmark

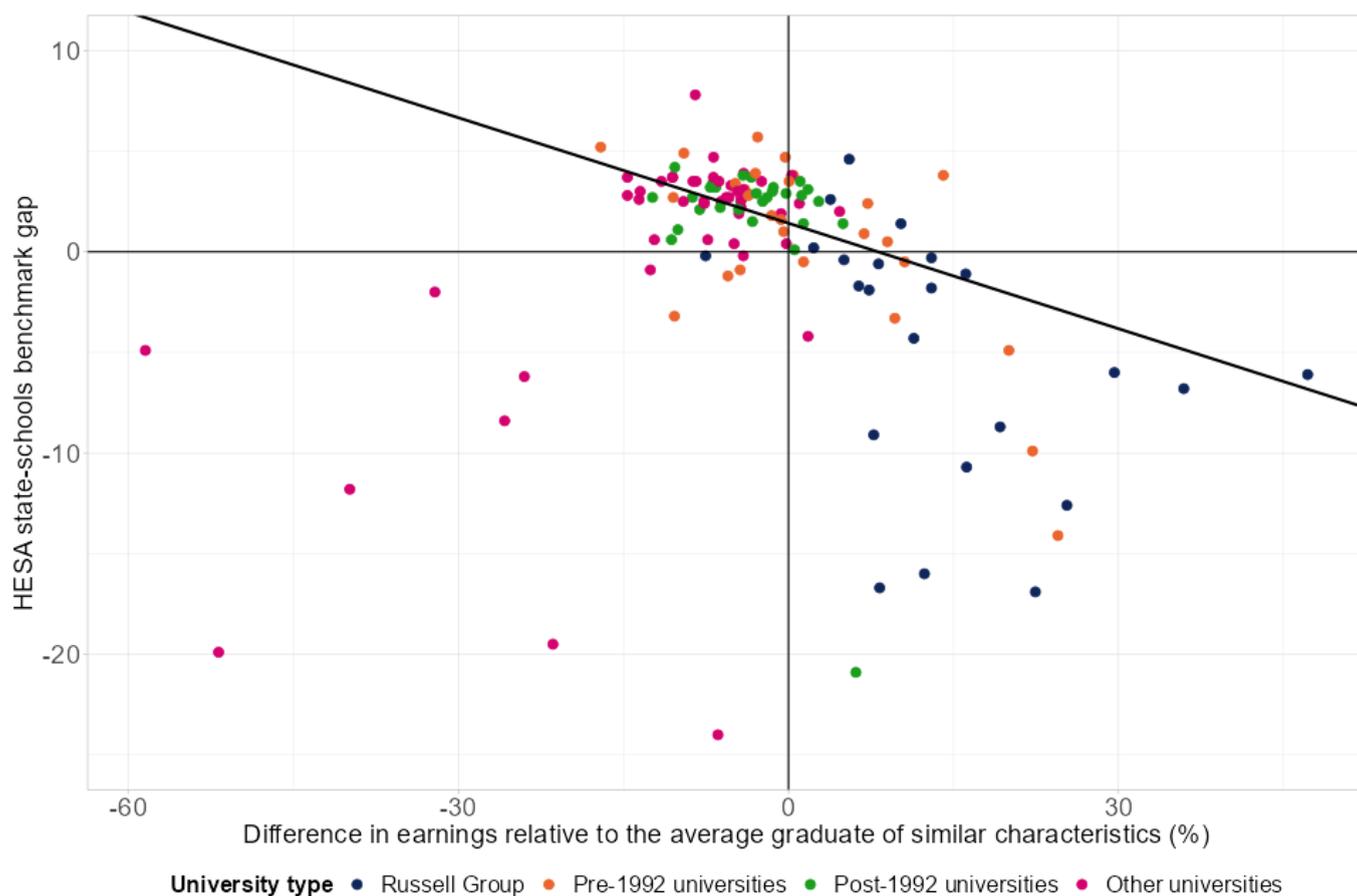
In Figure 11 we show a similar plot of Figure 9, but with value-add in returns for men by university instead of raw average returns. There also appears to be a slightly negative correlation between a university's value-add and its performance on the HESA state-school benchmark. The line of best fit suggests that for every one percentage point increase in the value-add in earnings of men relative to the average degree, the corresponding gap in the state-school benchmark is 0.17 percentage points lower.

In Figure 12 we show the equivalent plot of Figure 11 for women's value-add. The line of best fit shows there is also a negative correlation for women, with a one percentage point increase in the value-add in earnings of women relative to the average degree being associated with a 0.19 percentage point lower performance in their HESA state-school benchmark.

These findings may imply that the opportunities which arise from attending universities with the highest earnings returns and value-add may be harder to come by for students from a state-school background, relative to students who were privately educated.

Figure 11: The relationship between the HESA benchmark and value-add in earnings by university type for men.

HESA benchmark gap in access to state-school pupils (negative implies underperformance) by the average men's value-add in earnings for each university type.

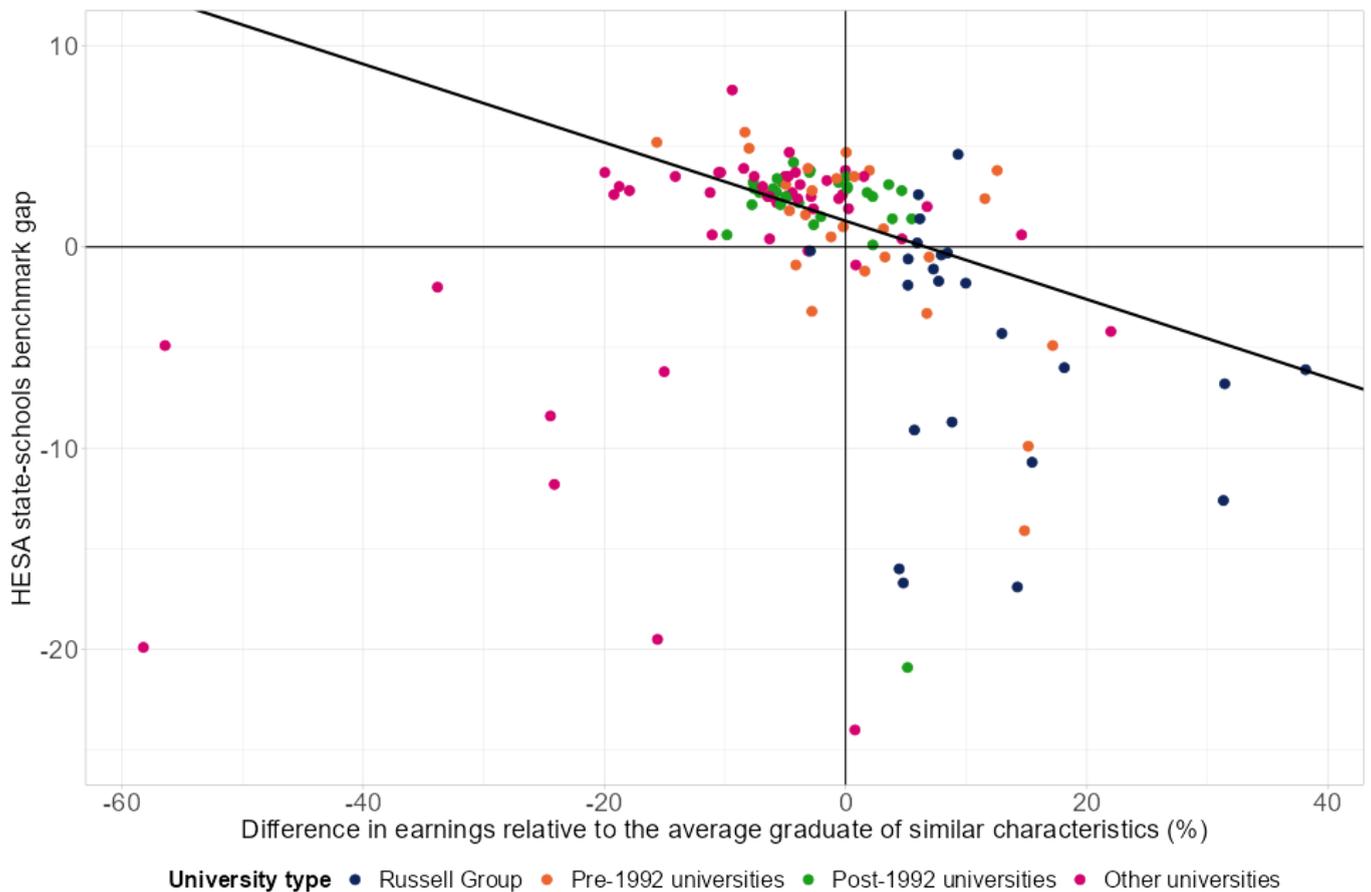


Source: Data from HESA widening participation table T1 for academic year 2020 to 2021 and Belfield and others (IFS), 'The impact of undergraduate degrees on early-career earnings', 2018b, based on the 2002 to 2007 GCSE cohorts. Analysis done by SMC.

Note: Outliers are included in the plot, the regression line is based on the sample excluding outliers.

Figure 12: The relationship between the HESA benchmark and value-add in earnings by university type for women.

HESA benchmark gap in access to state-school pupils (negative implies underperformance) by the average women's value-add in earnings for each university type.



Source: Data from HESA widening participation table T1 for academic year 2020 to 2021 and Belfield and others (IFS), 'The impact of undergraduate degrees on early-career earnings', 2018b, based on the 2002 to 2007 GCSE cohorts. Analysis done by SMC.

Note: Outliers are included in the plot, the regression line is based on the sample excluding outliers.

Analysis of the Higher Education Statistics Agency's POLAR4 benchmark

We considered how the HESA POLAR4 benchmark varies by value-add and raw returns for men and women. POLAR4 is a measure which captures participation rates in HE for those aged 18 to 19. The measure involves ranking local areas into 5 groups which each represent 20% of the population. Of these quintiles, the bottom one (quintile 1) which has the lowest HE participation rates is defined as a low-participation neighbourhood.⁵⁸ We use the publicly available data from HESA to calculate a POLAR4 benchmark gap, in which a positive value indicates that a university has a greater proportion of entrants from low-participation neighbourhoods than the benchmark (so overperforming the benchmark). Therefore, a negative gap implies an underperformance relative to the benchmark.

Overall, Russell Group and pre-1992 universities have a mean POLAR4 benchmark of 8.2 and 11.9 percentage points respectively. These university groups have a gap of -1 and -1.8 percentage points respectively, implying that on average a university in these groups tends to underperform relative to their POLAR4 benchmark. The median gap for these groups is also negative at -0.7 and -1.4 percentage points respectively. This implies the majority of universities in these groups underperform on their low-participation neighbourhood benchmark.

As with the state-school benchmark, post-1992 universities tend to overperform on their low-participation neighbourhood benchmark. The mean POLAR4 benchmark for a post-1992 university is higher than for the other groups with 14.3 percentage points. However, the mean gap is just above zero (0.1 percentage points) and the median gap is 1.2. The POLAR4 mean and median gaps are similar for the 'other universities' group at 0.1 and 1.2 percentage points respectively. Therefore, as with the state-school benchmark, post-1992 universities and the 'other universities' group overall tend to accept a relatively higher proportion of students from disadvantaged backgrounds than the groups of universities which are generally associated with higher earnings returns.

There is also a lot of variation in the size of the POLAR4 gap across all universities. The university with the lowest proportion of students from a low-participation neighbourhood compared to its benchmark is Middlesex University, at 10.6 percentage points below its benchmark. The institution with the highest proportion of students from a low-participation

⁵⁸ See the HESA description of the methodology on POLAR4. HESA, '[Definitions and benchmark factors](#)'. Published on HESA.AC.UK.

neighbourhood compared to its benchmark is Sunderland University with 15.8 percentage points above its benchmark. Both of these institutions are classed as post-1992 universities.

As with the HESA state-school benchmark, there is also a lot of variation among universities within each university group. Within the Russell Group universities, the University of Sheffield has the highest proportion of students from low-participation neighbourhoods compared to its benchmark with 1.5 percentage points above its benchmark. Within the Russell Group, Queen Mary University of London has the lowest proportion of students from low-participation neighbourhoods with 6.5 percentage points below its benchmark gap. This is interesting because among the Russell Group universities, Queen Mary University of London had the highest proportion of state-schooled students compared to its benchmark. As Queen Mary perform well on other access measures, it would seem this reflects potential limitations in the POLAR4 measure, particularly for students originally from London, and Queen Mary's tendency to admit more students from the London area⁵⁹.

As highlighted above, the universities with the highest and lowest proportions of students from low-participation neighbourhoods compared to their benchmark are post-1992 universities. This shows there is a lot of variation with the post-1992 group of universities. Similarly, there is also a lot of variation in the POLAR4 gap among pre-1992 universities. The University of Hull and Keele University have the highest proportion of students from low-participation neighbourhoods compared to their benchmark with 14.5 and 5.5 percentage points above their benchmark respectively. City, University of London and Brunel University London have the lowest proportion of students from low-participation neighbourhoods compared to their benchmark with around 9.5 percentage points below their benchmark.

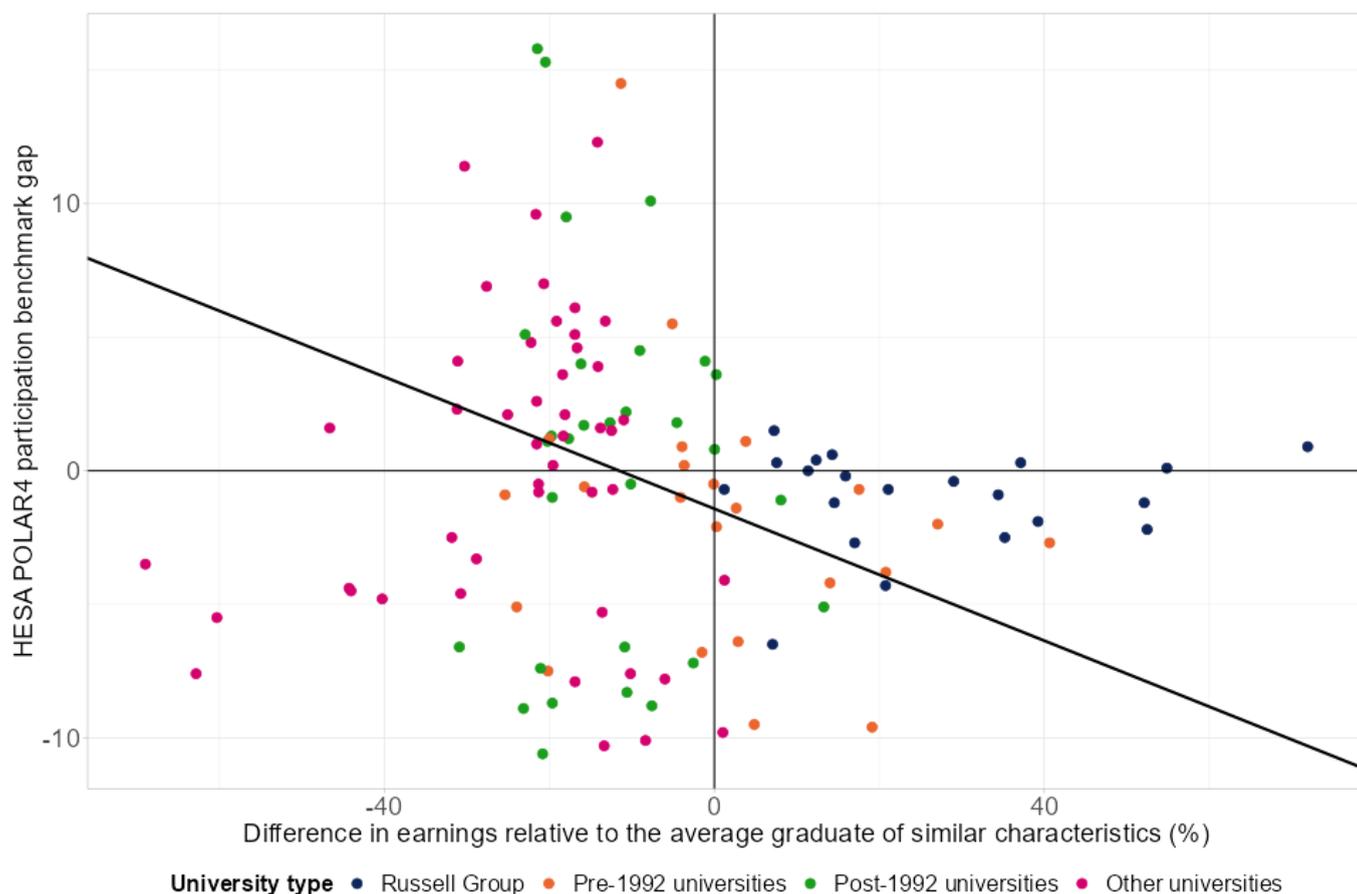
As with the HESA state-school benchmark, we also look at the correlation of the POLAR4 benchmark gap and the earnings returns for universities. We estimate lines of best fit for each gender's raw earnings, value-add and POLAR4 benchmark gap. These are estimated by excluding outliers, with the same thresholds adopted as with the state-school benchmark analysis above, at an absolute value of 10 percentage points in the gap and 20 percentage points in the earnings and value-add relative to the average degree. However, we include the outliers in our plots to show the full distribution of universities.

⁵⁹ Queen Mary University of London has published an Access and Participation plan for 2020-21 to 2024-25 ([see here](#)). In this document the university discusses their view on the limitations of using the POLAR4 metric to assess access.

Figures 13 and 14 show scatter plots of the HESA POLAR4 benchmark against men's raw earnings and value-add respectively. The correlation between the gap and earnings implies that universities which tend to have higher average earnings of a higher value-add, tend to underperform more on their low-participation neighbourhood benchmark. The line of best fit for men's raw earnings (Figure 13) suggests that for every 1 percentage point higher earnings relative to the average degree, a university has a 0.13 percentage point worse performance on its POLAR4 benchmark gap. The correlation appears to be similar when considering value-add, as the line of best fit in Figure 14 suggests a 0.12 percentage point worse performance on a university's POLAR4 benchmark gap for every 1 percentage increase in value-add in earnings relative to the average degree.

Figure 13: The relationship between the HESA POLAR4 benchmark and raw earnings in earnings by university type for men.

HESA POLAR4 gap (negative implies underperformance) by the average men's raw earnings in earnings for each university type.

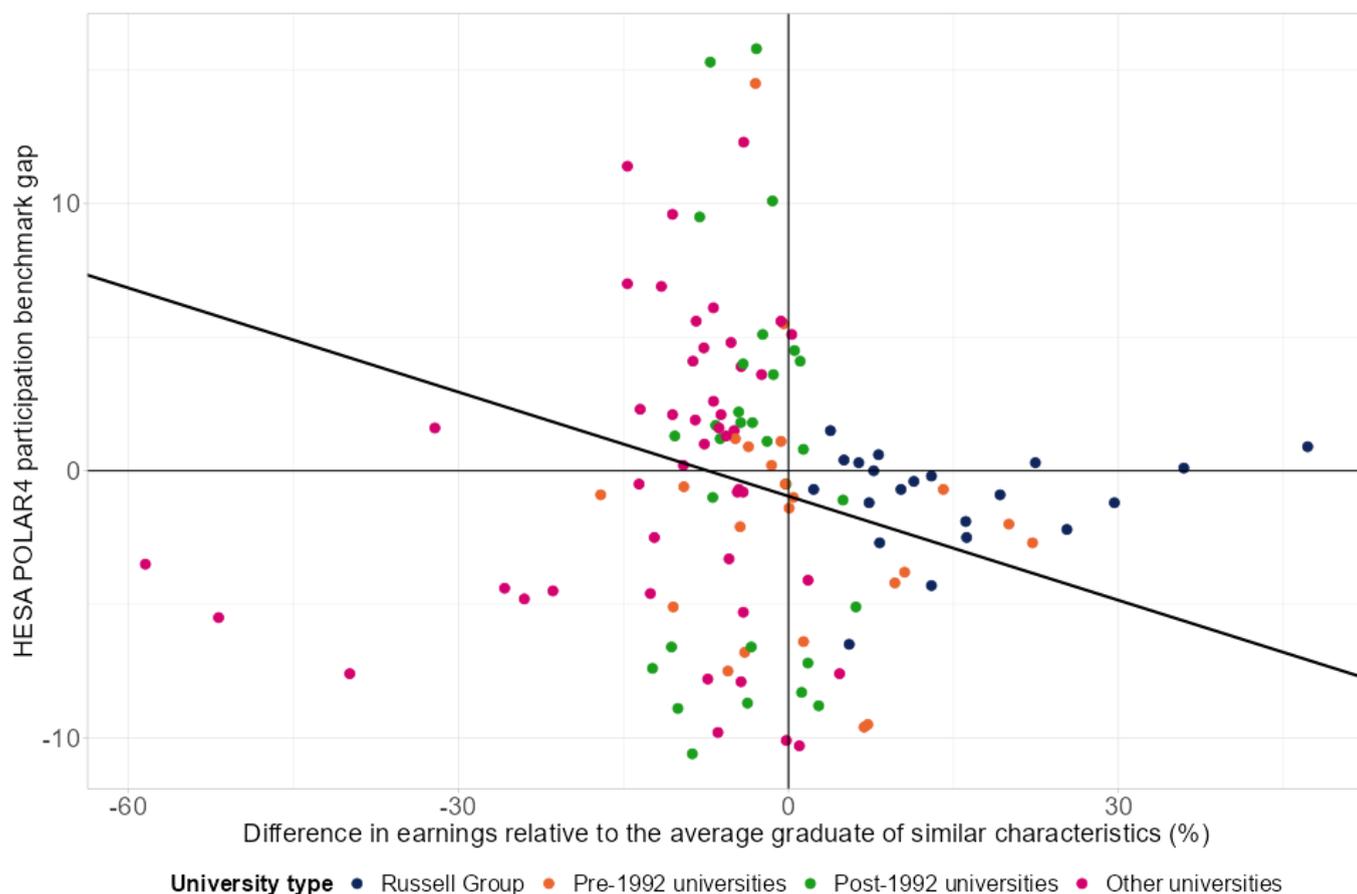


Source: Data from HESA widening participation table T1 for academic year 2020 to 2021 and Belfield and others (IFS), 'The impact of undergraduate degrees on early-career earnings', 2018b, based on the 2002 to 2007 GCSE cohorts. Analysis done by SMC.

Note: Outliers are included in the plot, the regression line is based on the sample excluding outliers.

Figure 14: The relationship between the HESA POLAR4 benchmark and value-add in earnings by university type for men.

HESA POLAR4 gap (negative implies underperformance) by the average men's value-add in earnings for each university type.



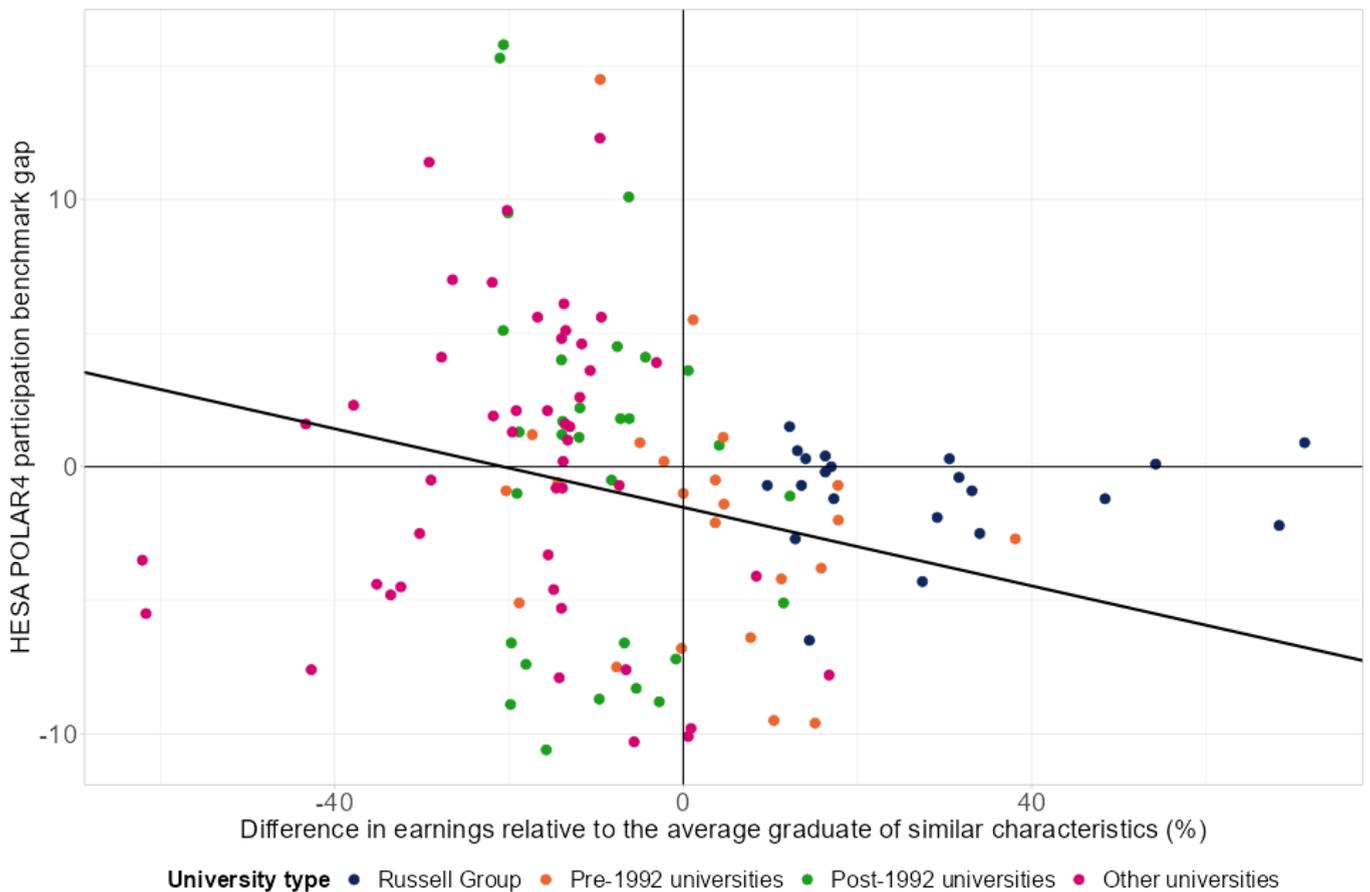
Source: Data from HESA widening participation table T1 for academic year 2020 to 2021 and Belfield and others (IFS), 'The impact of undergraduate degrees on early-career earnings', 2018b, based on the 2002 to 2007 GCSE cohorts. Analysis done by SMC.

Note: Outliers are included in the plot, the regression line is based on the sample excluding outliers.

Figures 15 and 16 show the equivalent plots and lines of best fit for women's raw earnings and value-add respectively. As with men's earnings, there is a negative correlation between the average women's earnings or value-add at a university and the university's performance on the POLAR4 gap. The line of best fit in Figure 15 suggests that for every 1 percentage point increase in the average raw women's earnings relative to the average degree, a university has a 0.07 percentage point lower POLAR4 benchmark gap. The line of best fit in Figure 16 suggests that every 1 percentage point increase in the average value-add in women's earnings relative to the average degree, a university has a 0.14 percentage point lower POLAR4 benchmark gap.

Figure 15: The relationship between the HESA POLAR4 benchmark and raw earnings in earnings by university type for women.

HESA POLAR4 gap (negative implies underperformance) by the average women's raw earnings in earnings for each university type.

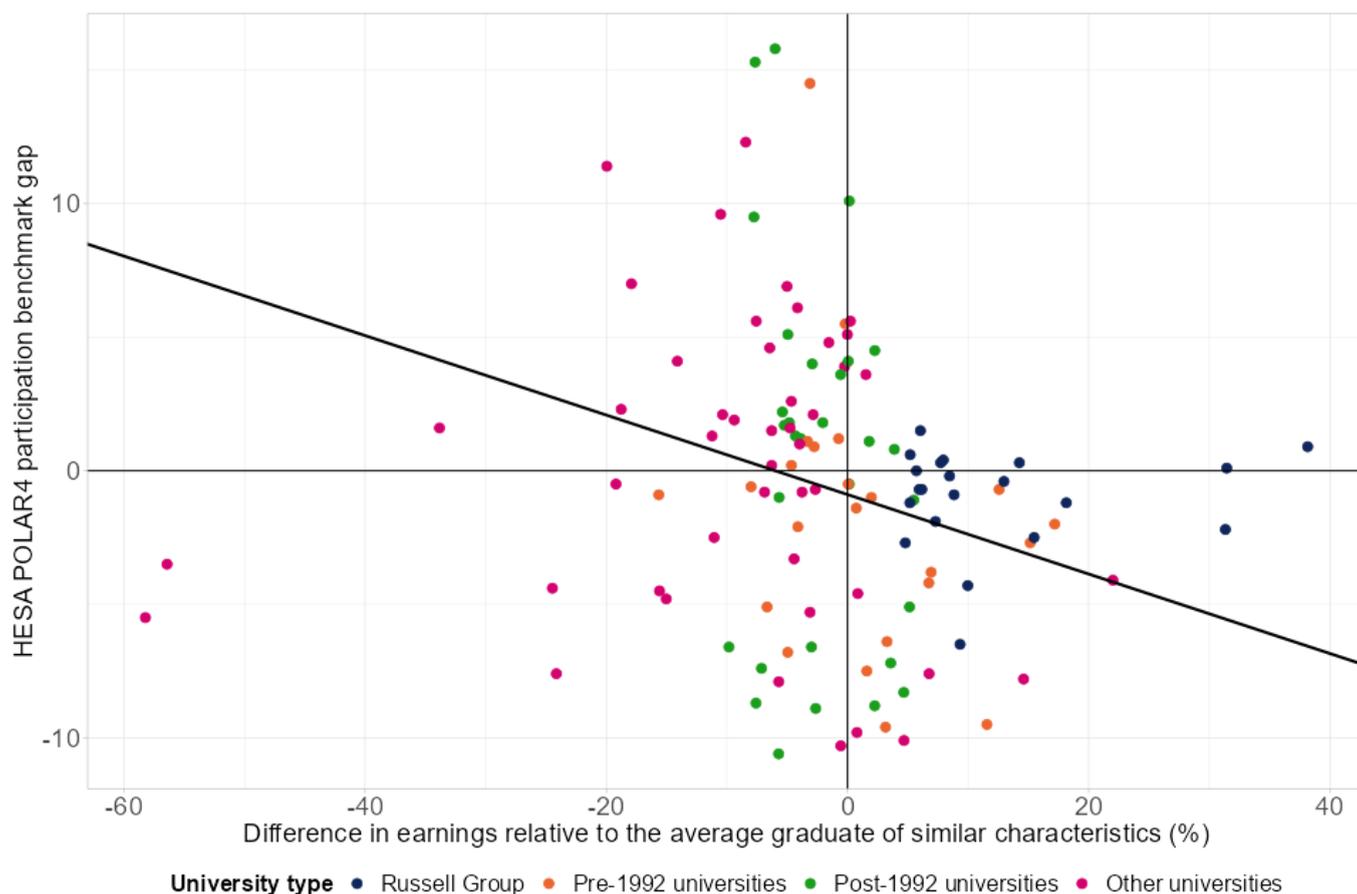


Source: Data from HESA widening participation table T1 for academic year 2020 to 2021 and Belfield and others (IFS), 'The impact of undergraduate degrees on early-career earnings', 2018b, based on the 2002 to 2007 GCSE cohorts. Analysis done by SMC.

Note: Outliers are included in the plot, the regression line is based on the sample excluding outliers.

Figure 16: The relationship between the HESA POLAR4 benchmark and value-add in earnings by university type for women.

HESA POLAR4 gap (negative implies underperformance) by the average women's value-add in earnings for each university type.



Source: Data from HESA widening participation table T1 for academic year 2020 to 2021 and Belfield and others (IFS), 'The impact of undergraduate degrees on early-career earnings', 2018b, based on the 2002 to 2007 GCSE cohorts. Analysis done by SMC.

Note: Outliers are included in the plot, the regression line is based on the sample excluding outliers.

Overall, the evidence suggests a slightly negative correlation between both average earnings and value-add in earnings, and a university's accessibility to students from disadvantaged neighbourhoods.

Summary

- Overall, universities with higher average earnings or a higher value-add in earnings tend to take in fewer students from state schools or low-participation neighbourhoods than their HESA benchmark.
- These findings suggest that there is room for improvement in making universities more accessible to those from disadvantaged backgrounds. This may be important for social mobility because the universities with a higher value-add in earnings tend to accept fewer disadvantaged students than their benchmark.
- More academically selective universities, such as those in the Russell Group, tend to be more likely to underperform on these widening participation benchmarks.
- Post-1992 universities tend to be more likely to overperform on their widening participation benchmarks.
- These findings are consistent when looking at men's and women's earnings.

How do returns vary by subject?

The evidence we reviewed suggests that both earnings and value-add in earnings vary by subject. The below charts (Figures 17 for men and 18 for women) show the estimate of the increase in raw earnings and value-add in earnings associated with studying a given subject.⁶⁰ On average, medicine and economics have the highest raw earnings with over 80% relative to the average earner who did not attend HE.

The charts also show how the size of the estimated increase in earnings associated with each subject decreases once other characteristics are controlled for. This is not surprising. We would expect those who attend a university course to generally have a relatively higher earnings potential, since they are likely to have a relatively higher prior attainment. The charts indicate that studying economics has the highest value-add for men, with a 33% increase in earnings relative to the average person with similar background characteristics who did not attend HE.

For women, the highest value-add subject is medicine, with 75% higher earnings relative to those with similar background characteristics who did not attend HE. Creative arts has the lowest value-add in earnings for both men (-14%) and women (+9%) relative to those with similar background characteristics who did not attend HE.

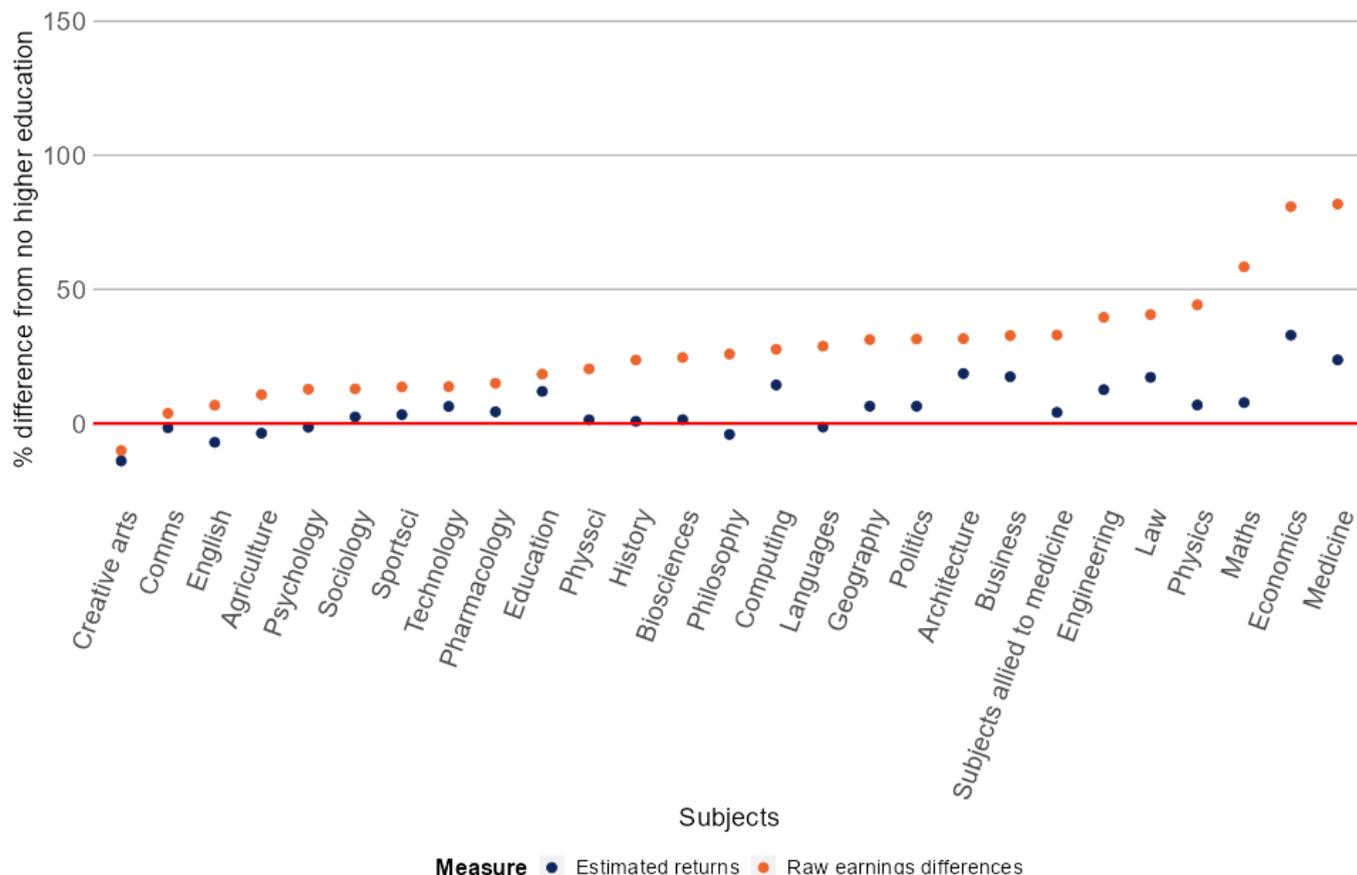
Overall, the following subjects are associated with a negative value-add in earnings at age 29 for men: creative arts, communications, English, agriculture, sociology, philosophy and languages.⁶¹ For women, the authors do not find any subjects associated with a negative value-add in earnings at age 29. However, the below charts do not consider the uncertainty around the estimates and it is possible that some subjects do not have a statistically significant negative value-add in earnings at age 29.

⁶⁰ Chris Belfield and others, [‘The impact of undergraduate degrees on early-career earnings’](#), 2018. Published on GOV.UK.

⁶¹ Chris Belfield and others, [‘The impact of undergraduate degrees on early-career earnings’](#), 2018. Published on GOV.UK.

Figure 17: Raw earnings differences and estimated returns at age 29 for men by subject.

Based on 2002 to 2007 GCSE cohorts, conditional on being in sustained employment. Raw differences only account for age at which the course started, and estimated returns account for age, background and prior attainment.

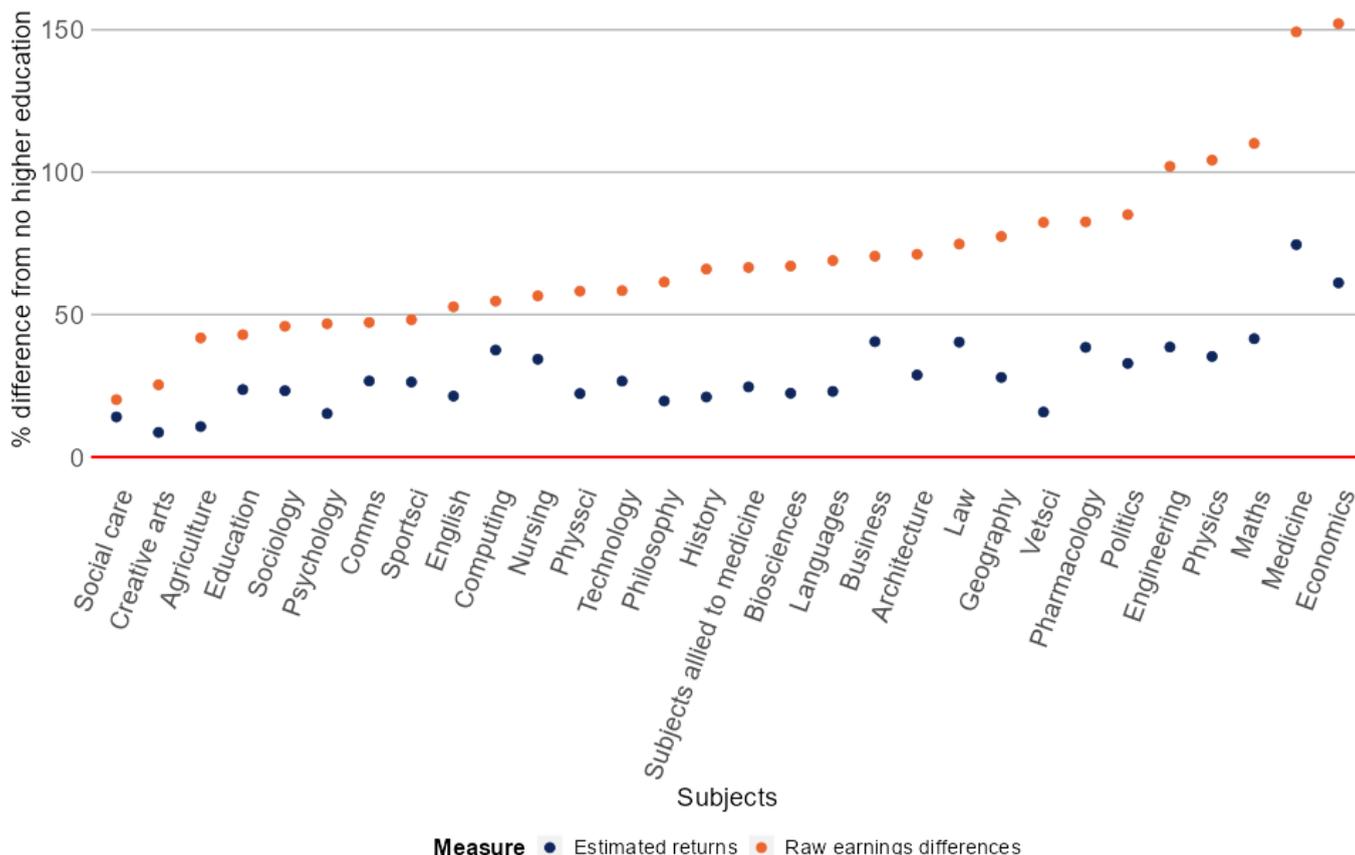


Source: Belfield and others (IFS), 'The impact of undergraduate degrees on early-career earnings', 2018b. Figure 16.

Note: Red line indicates the average earnings of a man who did not attend HE. Subjects are ranked based on raw earnings differences.

Figure 18: Raw earnings differences and estimated returns at age 29 by subject, women.

Based on 2002 to 2007 GCSE cohorts, conditional on being in sustained employment. Raw differences only account for age at which course started, and estimated returns account for age, background and prior attainment.



Source: Belfield and others (IFS), 'The impact of undergraduate degrees on early-career earnings', 2018b. Figure 17.

Note: Red line indicates the average earnings of a woman who did not attend HE. Subjects are ranked based on raw earnings differences. HEIs are sorted on raw earnings. HEI = higher education institution.

An important question is whether certain subjects are better for social mobility than others. As with university-level returns (described in the section earlier), Britton and others (2021) estimate a measure they call ‘mobility rates’ to show both how accessible a subject is to students who were FSM-eligible and their likelihood of becoming a high earner (making it into the top 20% of earners by the age of 30).^{62 63}

They find that there is a large amount of variation in the mobility rates by subject. Pharmacology has the highest mobility rate with 4% of students who were on FSM becoming a top 20% earner by the age of 30. Law, computing and business also achieve relatively high mobility rates.

Some subjects such as economics have high ‘success’ rates (implying a relatively high likelihood of making it into the top 20% of earners) but relatively few students were on FSM at the age of 16. We are interested in understanding more about subjects which seem to have high ‘success rates’ but low ‘access rates’. Improving the accessibility of these subjects to disadvantaged students might have a positive impact on social mobility.

Arts and humanities subjects seem to perform poorly on mobility rates but law, economics and management subjects do well and science, technology, engineering, and maths (STEM) subjects have mixed results.⁶⁴ Britton and others (2021) also find that their findings do not change much when controlling for individual characteristics. This suggests that there may be some element of the subject contributing to the higher mobility rates observed rather than it being due to the types of people who study a given subject. Figure 19 below shows the mobility rates by subject before controlling for student characteristics (unconditional) and after controlling for them (conditional). Maths, medicine and economics drop in mobility rates after controlling for student characteristics, while subjects such as social care improve.

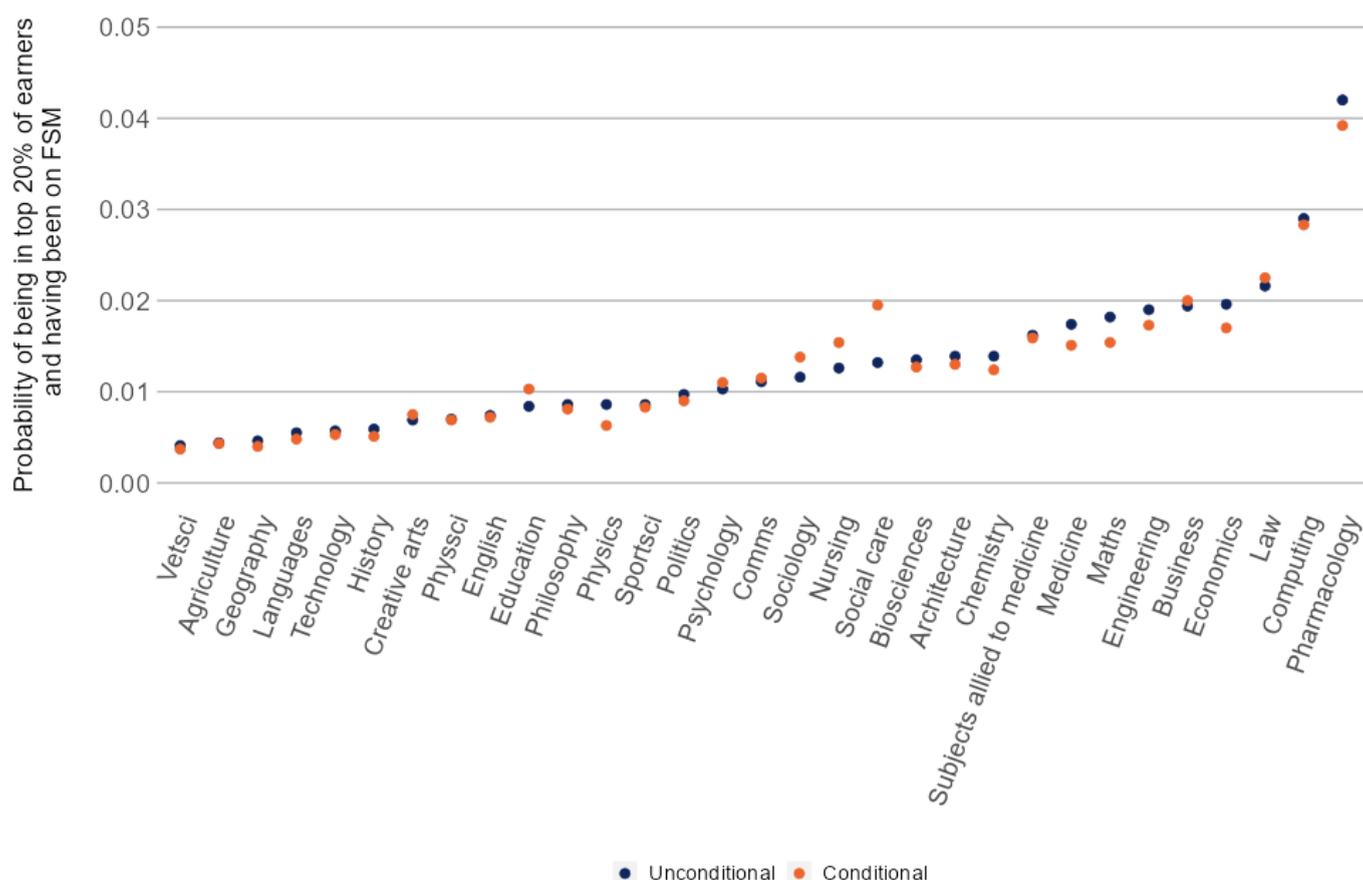
⁶² Jack Britton and others, ‘[Which university degrees are best for intergenerational mobility?](#)’, 2021. Published on [IFS.ORG.UK](#).

⁶³ Mobility rates are calculated by multiplying the access rate by the success rate. The authors define the access rate as the proportion of students who were on free school meals (FSM) at the age of 16. The success rate is defined as the probability of a student making it into the top 20% of earners conditional on them having been on FSM at the age of 16.

⁶⁴ Jack Britton and others, ‘[Which university degrees are best for intergenerational mobility?](#)’, 2021. Published on [IFS.ORG.UK](#).

Figure 19: Conditional mobility rates by subject.

Conditional mobility rates are calculated by multiplying conditional success rates by access rates for each university. Conditional success rates are based on the probability of being in the top 20% of earners at age 30 after controlling for other factors.⁶⁵ Access rates are based on the probability of having been on FSM at age 16. Conditional mobility rates are split by subject.



Source: Britton and others (IFS), 'Which university degrees are best for intergenerational mobility?', 2021. Figure 20.

There is also evidence to suggest that earnings returns for the same subject can vary by gender. Britton and others (2020) estimate that lifetime earnings returns for women are close to zero on average for creative arts and languages graduates, but more than £250,000 for law, economics or medicine.⁶⁶ There is a similar pattern among men, but there are negative average returns for men studying creative arts and social care, and average returns of around £500,000 for men studying medicine or economics.

⁶⁵ Other factors include a student's key stage 4 grades, home region, ethnicity and gender.

⁶⁶ Department for Education, Institute for Fiscal Studies, Jack Britton and others, '[The impact of undergraduate degrees on lifetime earnings](#)', 2020. Published on GOV.UK.

How do returns vary by subject and institution?

Looking at the returns associated with studying a specific subject at a given university is relatively more difficult than looking at subject-level or university-level returns separately. This is due to smaller sample sizes. However, as LEO is administrative data, there have been some studies in the past 5 years which take advantage of the close to population level data to estimate returns by subject and institution combinations. Belfield and others (2018b) estimate the returns of over 1,000 subject and university combinations for men and women at age 29 and find a striking amount of variation.⁶⁷ Overall, they find that the courses associated with the highest returns more than doubled earnings relative to similar individuals who did not attend HE.⁶⁸ Conversely, the courses associated with the lowest returns were estimated to more than halve the earnings of those who studied them relative to individuals with similar characteristics. The authors also find a large amount of variation in returns across courses at the same university, for example law and economics at the University of Cambridge were associated with over a 100% higher return for men and women, whereas creative arts at the same university was associated with roughly halving the returns relative to similar individuals.

Overall, the authors find that for men, 15% of courses accounting for 13% of male students have statistically significant negative returns. For women, 4% of courses accounting for 2% of female students have statistically significant negative returns. 58% of all students (71% of women and 42% of men) study a course with positive returns once accounting for uncertainty (being statistically significant).

Britton and others (2021) also look at subject and university combinations. The authors consider social mobility by looking at 'mobility rates' at subject level.⁶⁹ ⁷⁰ As with their subject-level and university-level analysis, they estimate mobility rates as a combination of access to a course by those eligible for FSM and the likelihood of ending up in the top 20% of earners. The authors

⁶⁷ Department for Education, Institute for Fiscal Studies, and Chris Belfield and others, '[The relative labour market returns to different degrees](#)', 2018. Published on GOV.UK.

⁶⁸ The controls used are similar to those as in the other estimates in Belfield and others (2018) and explained in more detail earlier in this review. The controls are: age, background and prior attainment.

⁶⁹ Jack Britton and others, '[Which university degrees are best for intergenerational mobility?](#)', 2021. Published on [IFS.ORG.UK](#).

⁷⁰ See above sections (X and Y) for a more detailed description of the methodology used and how mobility rates are defined.

also find a lot of variation with some courses which have no students from low-income backgrounds and some which have mobility rates over 10%. They find that computing, law and economics courses at London-based universities tend to dominate the top 20 courses when ranked on mobility rates. However, courses that are classed as arts and humanities tend to score worse on mobility rates. Furthermore, within a university, there is a lot of variation in mobility rates, as some universities are in the top 10% of mobility rankings for some subjects and in the bottom 10% for others. Overall, the authors find only a small positive correlation between estimated returns and the estimated mobility rates at the course level.

There is some evidence to suggest that students from disadvantaged backgrounds are more likely to undertake degrees associated with lower returns than their wealthier peers with similar grades. This is important as it may have implications for their graduate earnings and future social mobility prospects. Campbell and others (2021) refer to this occurrence as an 'undermatch' and define it as a student 'not attending their highest quality course possible' given their characteristics such as grades. The study finds that students from lower SEBs, particularly women, consistently 'undermatch' by undertaking degrees which have lower attaining peers and lower potential earnings. Crucially, on average, this seems to occur even when they have similar prior attainment and study similar degree subjects to those from higher SEBs.⁷¹

Furthermore, Campbell and others (2021) find this 'undermatch' occurs when taking factors such as geography and access to student financing into account, suggesting it is due to other reasons associated with SEB. The authors also find that the school attended plays a major role in estimating whether a student 'undermatches', with 79% of the gap in matching between people of lower and higher SEBs being explained by the school a pupil attends.⁷² This could indicate that peer effects, school resources and the university and careers information they provide is a driving force in university and course choice. The reasons students from disadvantaged backgrounds may be more likely to choose university courses associated with lower returns or entry requirements is something we are interested in improving our understanding of.

⁷¹ Stuart Campbell and others, '[Matching in the dark? Inequalities in student to degree match](#)', 2021. Published on NBER.ORG.

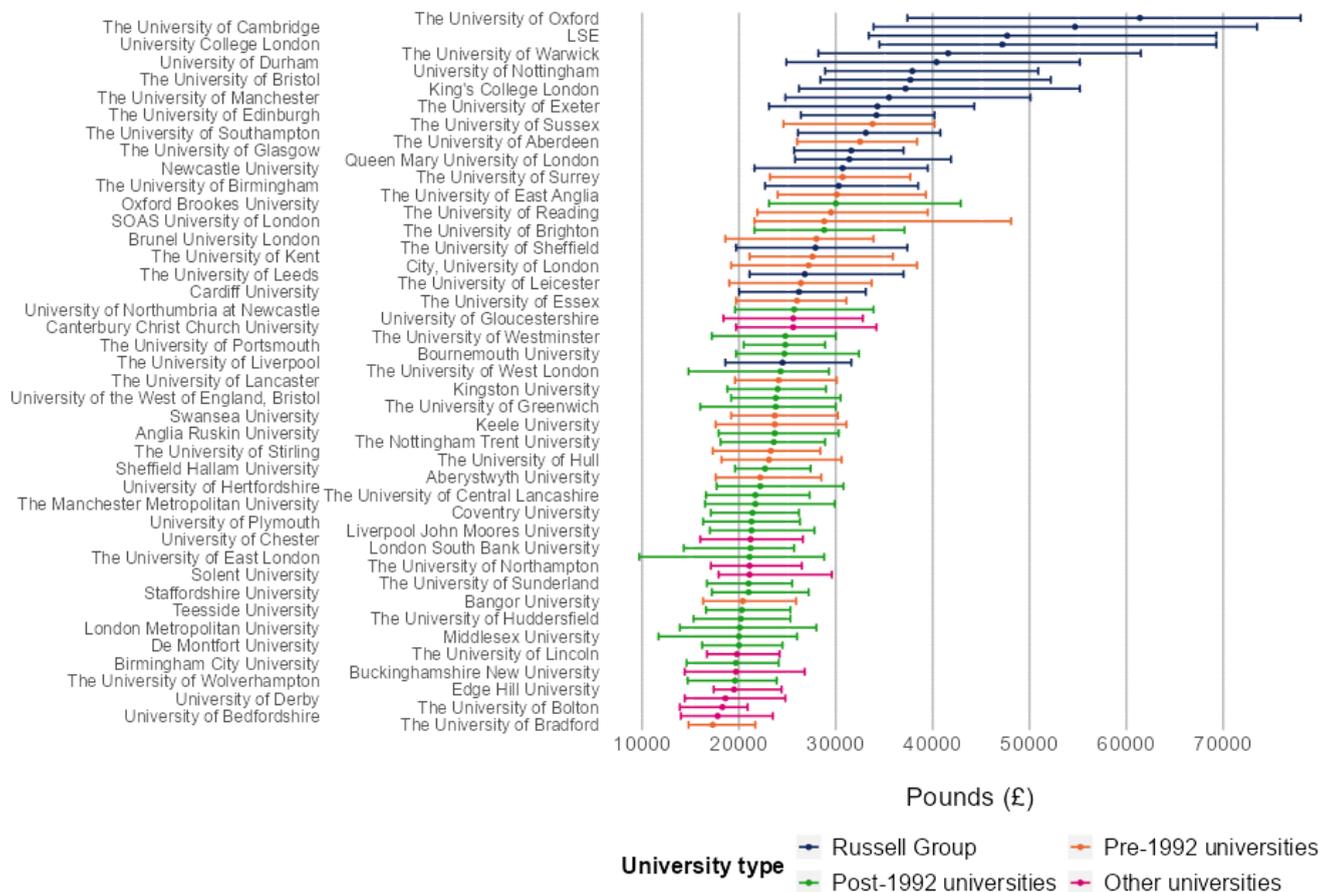
⁷² Stuart Campbell and others, '[Matching in the dark? Inequalities in student to degree match](#)', 2021. Published on NBER.ORG.

Experimental visualisation of earnings returns

A key motivation behind Action 53 is to empower prospective students to make informed decisions about which qualifications to study in order to provide them with the best chances of fulfilling their career ambitions. Potential future earnings associated with specific degrees may influence the decision of what subject someone chooses to study and at which university. The information on earnings returns for courses often covers the average earnings a graduate of the course might achieve after a set period. For example, Figure 20 shows the average earnings by university for those who studied law.

Figure 20: Average earnings by university 5 years after graduation for law students.

The median earnings in pounds for law students 5 years after their graduation year, includes both men and women.



Source: Department for Education experimental dataset 2017.⁷³ Chart produced by SMC.

Note: The middle point represents the median earnings, the left-most point the 25th percentile and the right-most point the 75th percentile. Sample consists of the 2008 to 2009 graduation cohort. The dataset is an experimental release and therefore findings should be treated with caution. LSE = London School of Economics and Political Science.

⁷³ Department for Education, '[Graduate outcomes for all subjects by university](#)', 2017. Published on GOV.UK.

Figure 20 shows:

- The Universities of Oxford and Cambridge have the highest raw earnings for law graduates, with estimated median earnings 5 years after graduation of over £60,000.
- This compares to some other universities such as London Metropolitan University, University of Derby, University of Bolton and the University of Bradford, where raw average earnings are around £20,000 or under for law graduates 5 years after graduation.
- Russell Group universities dominate the upper end of the raw average earnings range for law, with 17 of the top 20 universities for average raw earnings 5 years after graduation being from the Russell Group, and the other 3 of the top 20 being from pre-1992 universities.

Although average raw earnings can be useful information, there are also some risks associated with using them to estimate one's potential future earnings. This is because raw average earnings (such as in Figure 20) do not account for the characteristics of people who study a given course at a given university. This means the raw earnings we observe risk being more representative of the types of people who study a certain course at a specific university, rather than the actual improvement in earnings potential the qualification provides. For example, suppose there exists a university which accepts a relatively high proportion of students with an A-level in STEM subjects for a given course. It is plausible that these pupils may have been expected to have relatively high earnings in the future, even in the absence of their university education.⁷⁴ This could lead to this university reporting high average raw earnings for this course. Now, suppose that this university had a relatively low value-add in earnings for this course. If a prospective student without a STEM A-level were to decide to attend this course at this university because they saw the high average earnings figure, they may risk overestimating their expected earnings potential after studying the course. This is because the higher observed earnings are due to the types of students the university accepts onto the course rather than the skills developed by studying the course itself.

Similarly, there may be a university which on paper appears to have low average earnings for a course. However, what may not be reflected in this average earnings statistic, is that the

⁷⁴ A report by London Economics to the Department for Education finds that achieving one or more A-level passes in a STEM subject is associated with higher earnings relative to those who do not. London Economics, '[The earnings and employment returns to A levels](#)', 2015. Published on LONDON.ECONOMICS.CO.UK.

majority of students on this course may have lower than average school grades and so on average may be expected to have relatively lower earnings. Although average earnings are low, this course at this university could still have a relatively high value-add. This could occur if the university does a good job at upskilling their students through good teaching or has a good careers department. In this case, a prospective student may underestimate the potential impact studying the course at this university may have on their future earnings.

These examples show why we think it is important to consider value-add alongside the other labour market information made available for courses at universities. However, to the best of our knowledge, detailed visualisations of value-add of each university by subject are less readily available in the public domain. As our Action 53 commitment is to look at which information could help young people from disadvantaged backgrounds choose qualifications, we want to consider how to visualise the data already available in order to produce accessible charts and summary statistics. Our first step towards this is to use the publicly available data provided by the Department of Education (DfE) and Institute for Fiscal Studies (IFS) to produce charts of value-add in earnings by university for some popular subjects.

As this is only a first step we urge the reader to treat the following charts with caution and to not put too much weight on the findings. This is because we have not conducted the full due diligence required to produce publicly available charts to describe earnings returns by university and subject combination. In the future we would like to test different data sources, chart formats and statistics to help determine a suitable format for visualising the data in the future.

To create the charts for the value-add in earnings, we use the publicly available dataset provided alongside the Belfield and others (2018a) paper.⁷⁵ The IFS dataset captures the estimated value-add in earnings for men and women separately, so we include separate charts for each gender. The graduation cohort covered in these charts are from 2007 to 2008 and 2011 to 2012. The earnings are observed in financial years 2011 to 2012 and 2015 to 2016. The cohort from the DfE experimental dataset used to produce Figure 20 is also contained in the dataset used by Belfield and others (2018b). However, we urge the reader not to emphasise comparisons between Figure 20 and the law value-add charts (Figures 21 and 22) as the latter also consists of multiple other cohorts and are produced using a separate dataset.

⁷⁵ The spreadsheet containing the data can be found on gov.uk. UK Government, '[Undergraduate degrees relative labour market returns](#)', Published on GOV.UK.

Additional analysis on value-add

Caveat: These **value-add figures are only estimates**. This is because we are trying to estimate the true value-add associated with the university. As the data is broken down by both subject and institution, the sample sizes used to make these estimates were much smaller than those used to derive the findings on subject-level or institution-level returns earlier in this report. Smaller sample sizes mean there is a much larger margin of error for the estimates of value-add. Therefore, we have included 95% confidence intervals in the below charts. These are represented by a horizontal line which essentially tells us the range the true value-add of a university degree in a certain subject is with a 95% chance (or level of confidence). This means we would only expect the true value-add to lie outside the confidence interval (not be on the horizontal line) 5% of the time.

Findings:

- The margin of error for value-add estimates by university tend to be quite large. This can make it hard to draw conclusions about how the value-add from a specific university might differ from another. Although there is a lot of variation in value-add by subject, due to small sample sizes there is a large margin of error which means it is hard to identify universities with a statistically significant different value-add for a given subject. This occurs when the confidence intervals for 2 universities do not overlap. This would mean that there is a statistically significant difference between the estimated value-add of the 2 universities. If the confidence intervals do overlap, further statistical testing would be required to determine whether the estimates of value-add for the 2 universities are significantly different.⁷⁶
- For subjects generally associated with a high-value add, such as law, economics, maths, business and engineering, **value-added returns are highest for Russell Group universities**. This is generally followed by pre-1992 universities and then by post-1992 universities.
- Medicine follows a different trend, in which the **pre-1992 universities tend to have the highest value-add**. This may be because the type of student who would usually attend a

⁷⁶ We would need to do a test of difference in means for the universities with overlapping confidence intervals in order to determine whether the value-add is statistically significantly different between the 2 universities.

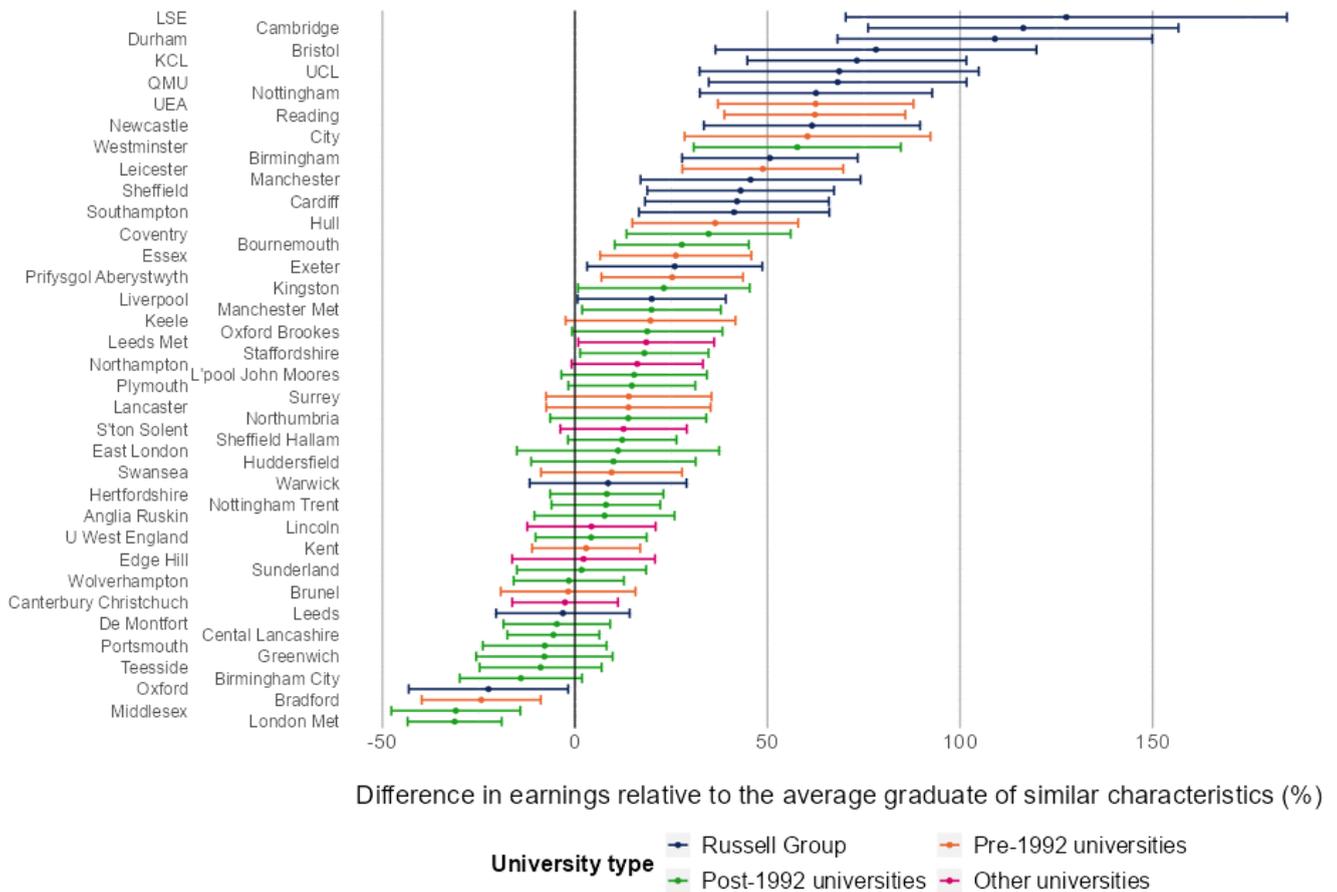
pre-1992 university such as Keele University may have lower expected earnings in the future, but by studying medicine their earnings potential experiences the greatest increase. This may imply that offering medicine at pre-1992 universities could be associated with social mobility benefits, but this idea would require some further research and testing. It is also worth noting that no post-1992 universities offering medicine were in our sample – this may be due to sampling issues or because few post-1992 universities offer medicine. Observations of higher returns in medicine may also be explained by the pay structure in the medical field.

- Most creative arts courses have a negative value-add when compared to the average student of similar characteristics.⁷⁷ However, there seems to be a less clear relationship between the type of university and the value-add for these subjects.
- **The relationship for language courses is less clear**, as value-add does not appear to be as related to the university type. An interesting outlier is the University of Oxford, for which languages graduates on average achieve the lowest value-add of all languages graduates in the sample. This may be because of how selective Oxford is, so that the university picks people who have characteristics associated with higher earnings in general (such as a high prior attainment). This means that compared to the average student with similar characteristics, Oxford languages graduates tend to significantly underperform in terms of value-add in earnings.
- Some university and subject combinations seem to correspond to a surprisingly low value-add. This includes the University of Edinburgh ranking bottom for value-add in maths and the University of Oxford ranking third from bottom for law. The report does not explain why these combinations have such a low value-add.
- The IFS does not provide raw earnings for university and subject combinations in its public data release, which means we cannot compare universities by both raw earnings and value-add for the same course.

⁷⁷ The HE Annex includes a description of what characteristics are covered in the controls.

Figure 21: Estimated value-add in earnings at age 29 by university for men who studied law.

The estimated average earnings difference (in %) relative to a graduate of any subject but with similar background characteristics.



Source: Belfield and others, (IFS), 'The impact of undergraduate degrees on early-career earnings', 2018b data. Chart produced by SMC.

Note: LSE = London School of Economics and Political Science, KCL = King's College London, UCL = University College London, QMU = Queen Mary University of London, UEA = University of East Anglia

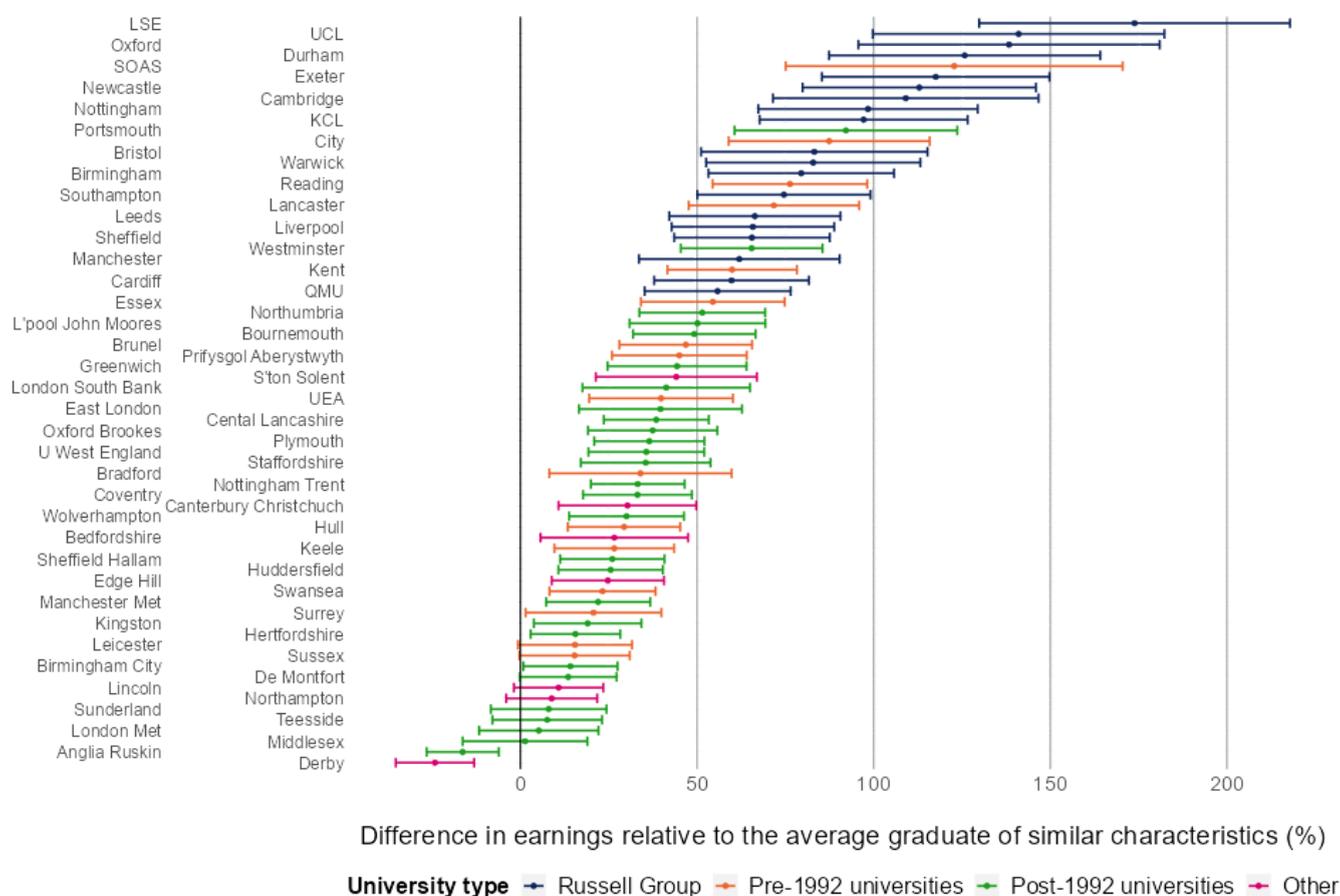
Law value-add for men:

- LSE appears to have the highest value-add for male law graduates, with over 125% difference in earnings relative to the average graduate of similar characteristics.
- Most universities have a positive value-add for earnings at age 29 for men who studied law.

- Interestingly, The University of Oxford is the only Russell Group university to have a statistically significant negative value-add for men studying law. Only 3 of the 'other universities' have a statistically significant negative value-add for law, these are London Metropolitan University, Middlesex University and the University of Bradford.

Figure 22: Estimated value-add in earnings at age 29 by university for women who studied law.

The estimated average earnings difference (in %) relative to a graduate of any subject but with similar background characteristics.



Source: Belfield and others (IFS), 'The impact of undergraduate degrees on early-career earnings', 2018b data. Chart produced by SMC.

Note: LSE = London School of Economics and Political Science, KCL = King's College London, UCL = University College London, QMU = Queen Mary University of London, UEA = University of East Anglia, SOAS = School of Oriental and African Studies University of London

Law value-add for women:

- Most universities have positive value-add for women who studied law. Only 2 universities have a statistically significant negative value-add in earnings for women, these are Anglia Ruskin University and the University of Derby.
- As for men, for those studying law, LSE also appears to have the highest value-add in earnings for women.
- Russell Group universities tend to have the highest value-add for women studying law.

Figure 23: Estimated value-add in earnings at age 29 by university for men who studied business.

The estimated average earnings difference (in %) relative to a graduate of any subject but with similar background characteristics.



Source: Belfield and others (IFS), 'The impact of undergraduate degrees on early-career earnings', 2018b data. Chart produced by SMC.

Note: LSE = London School of Economics and Political Science, KCL = King's College London, UCL = University College London, QMU = Queen Mary University of London, UEA = University of East Anglia

Business value-add for men:

- The University of Bath has the highest value-add for male business graduates at age 29, at around 115% difference in earnings relative to the average graduate of similar characteristics.

- Most universities have a positive value-add for earnings at age 29 for male business graduates.
- More universities have a negative value-add for business for males compared to females, and the majority of these universities belong to the 'other universities' group.

Figure 24: Estimated value-add in earnings at age 29 by university for women who studied business.

The average earnings difference (in %) relative to a graduate of any subject but with similar background characteristics.



Source: Belfield and others (IFS), 'The impact of undergraduate degrees on early-career earnings', 2018b data. Chart produced by SMC.

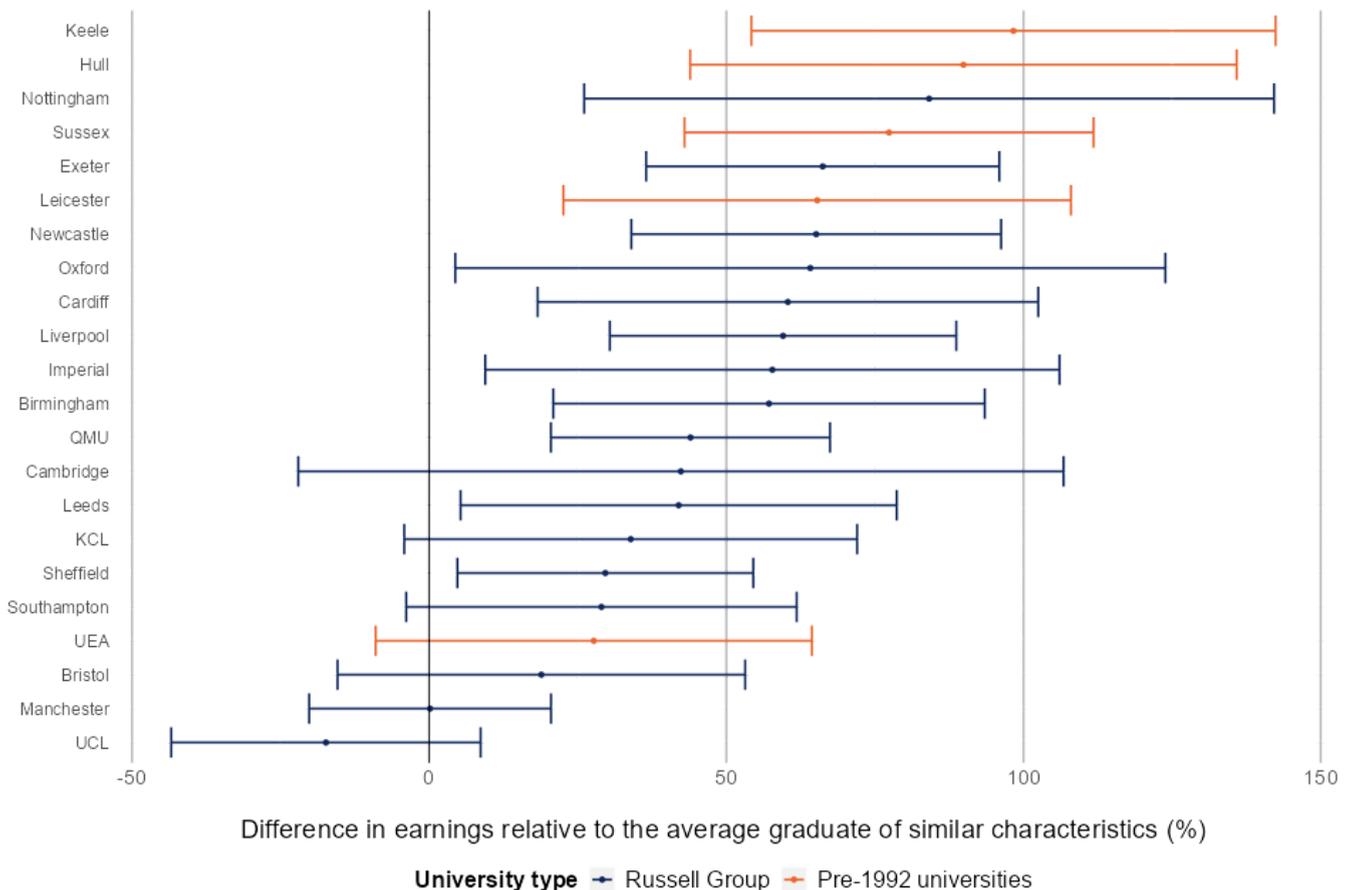
Note: LSE = London School of Economics and Political Science, KCL = King's College London, QMU = Queen Mary University of London, UEA = University of East Anglia

Business value-add for women:

- Most universities have a positive value-add for earnings at age 29 for women who studied business.
- As with men, the University of Bath also has the highest value-add in earnings for women who studied business, with over 110% higher earnings relative to the average graduate of similar characteristics.
- Only one university has a statistically significant negative value-add for females studying business, this is London South Bank University.

Figure 25: Estimated value-add in earnings at age 29 by university for men who studied medicine.

The estimated average earnings difference (in %) relative to a graduate of any subject but with similar background characteristics.



Source: Belfield and others (IFS), 'The impact of undergraduate degrees on early-career earnings', 2018b data. Chart produced by SMC.

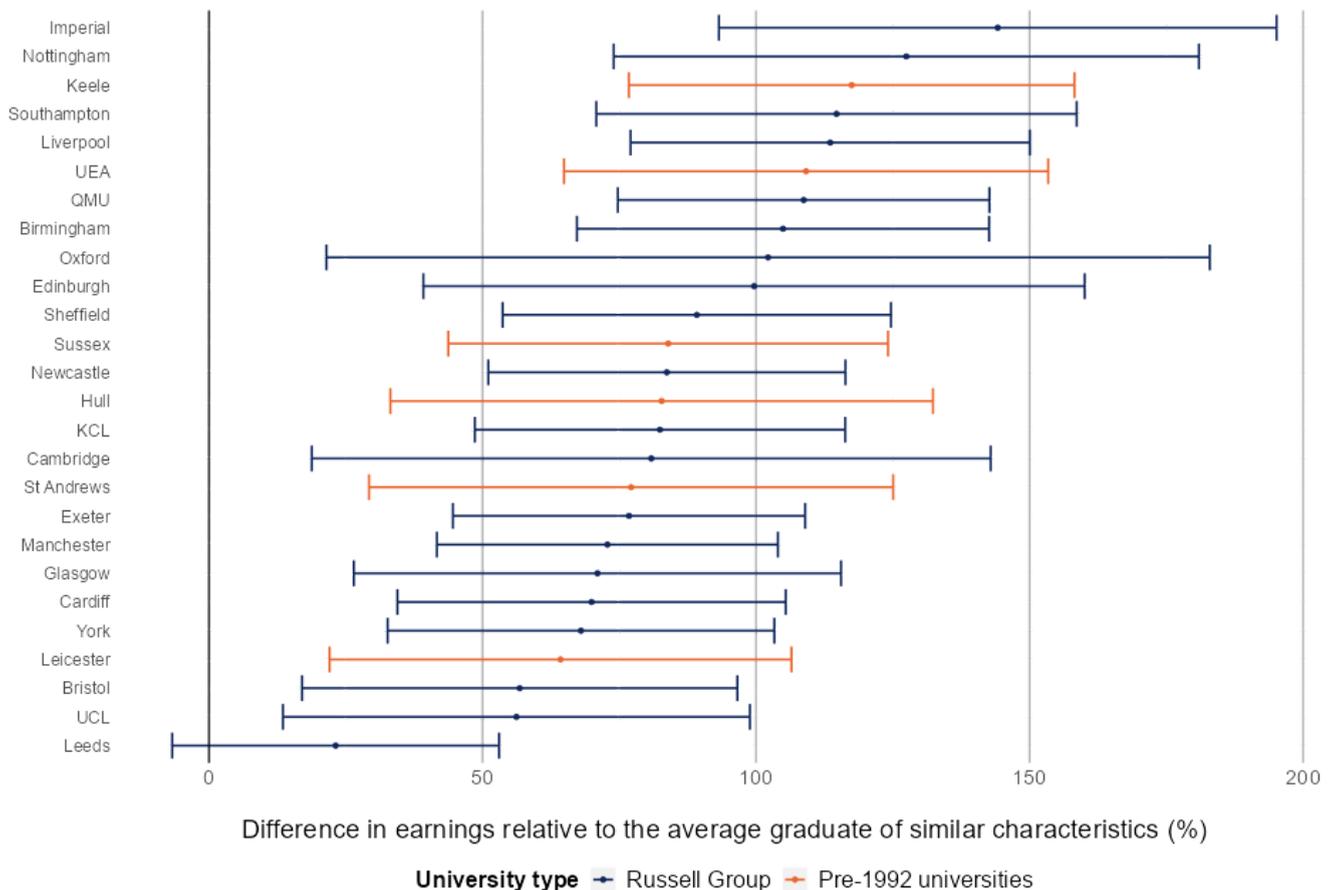
Note: KCL = King's College London, UCL = University College London, QMU = Queen Mary University of London, UEA = University of East Anglia

Medicine value-add for men:

- Almost all universities appear to have positive value-add for male medicine graduates at age 29. The only university that appears to have negative value-add is UCL.
- Pre-1992 universities make up 3 of the top 5 highest value-add universities for male medicine graduates.
- Keele University has the highest value-add at almost 100% difference in earnings relative to average graduates of similar characteristics.

Figure 26: Estimated value-add in earnings at age 29 by university for women who studied medicine.

The estimated average earnings difference (in %) relative to a graduate of any subject but with similar background characteristics.



Source: Belfield and others (IFS), ‘The impact of undergraduate degrees on early-career earnings’, 2018b data. Chart produced by SMC.

Note: KCL = King's College London, UCL = University College London, QMU = Queen Mary University of London, UEA = University of East Anglia

Medicine value-add for women:

- All universities appear to have positive value-add in earnings for women studying medicine.
- Imperial College London has the highest value-add in earnings for women, at almost 150% difference in earnings relative to the average graduate of similar characteristics.

Figure 27: Estimated value-add in earnings at age 29 by university for men who studied engineering.

The estimated average earnings difference (in %) relative to a graduate of any subject but with similar background characteristics.



Source: Belfield and others (IFS), 'The impact of undergraduate degrees on early-career earnings', 2018b data. Chart produced by SMC.

Note: KCL = King's College London, UCL = University College London, QMU = Queen Mary University of London

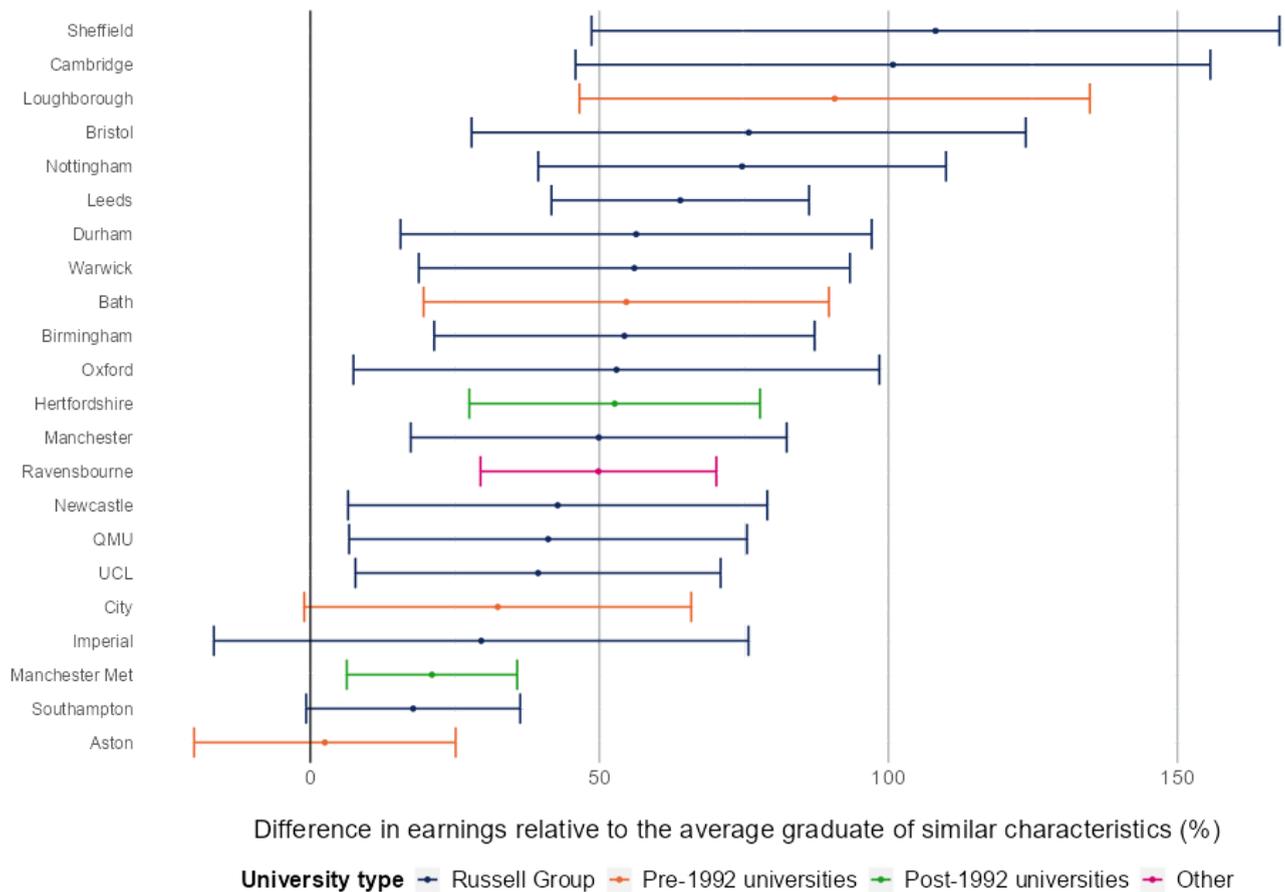
Engineering value-add for men:

- Russell Group universities University College London (UCL), Imperial College London, University of Cambridge and University of Warwick make up 4 of the top 5 universities for highest value-add for male engineering graduates. UCL has the highest value-add at around 80% difference in earnings relative to the average graduate of similar characteristics.
- Again, most universities have positive value-add for male graduates in this subject.

- Only 2 universities have a statistically significant negative-value add for engineering, these are the University of Derby and Ravensbourne University London.

Figure 28: Estimated value-add in earnings at age 29 by university for women who studied engineering.

The estimated average earnings difference (in %) relative to a graduate of any subject but with similar background characteristics.



Source: Belfield and others (IFS), ‘The impact of undergraduate degrees on early-career earnings’, 2018b data. Chart produced by SMC.

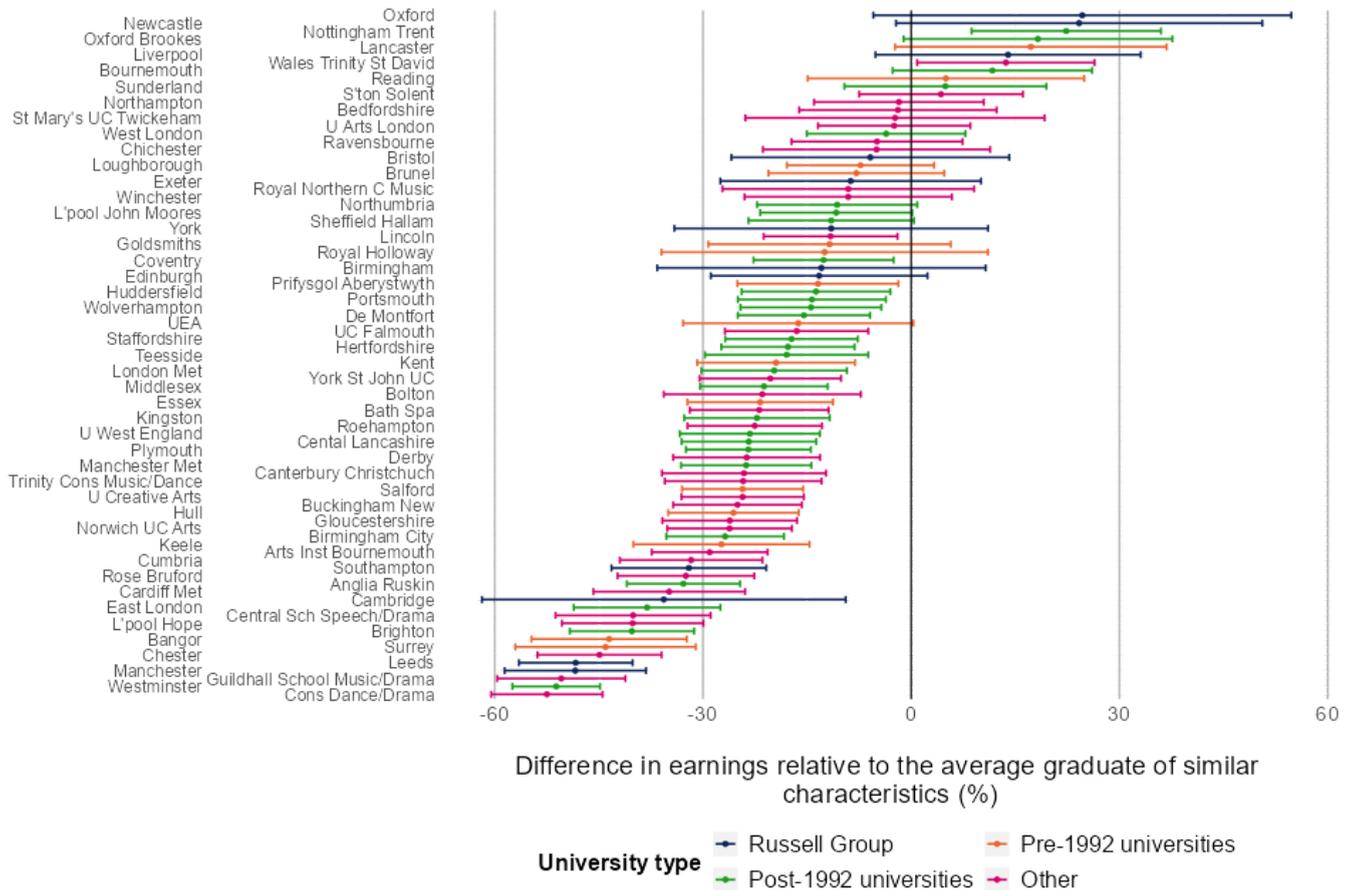
Note: UCL = University College London, QMU = Queen Mary University of London

Engineering value-add for women:

- All universities appear to have positive value-add in earnings for women who studied engineering, although estimates are not statistically significantly different from zero for Aston University, University of Southampton, Imperial College London and City, University of London.
- The University of Sheffield appears to have the highest value-add in earnings for women, at around 110% difference in earnings relative to the average graduate of similar characteristics.

Figure 29: Estimated value-add in earnings at age 29 by university for men who studied creative arts.

The estimated average earnings difference (in %) relative to a graduate of any subject but with similar background characteristics.



Source: Belfield and others (IFS), 'The impact of undergraduate degrees on early-career earnings', 2018b data. Chart produced by SMC.

Note: UEA = University of East Anglia

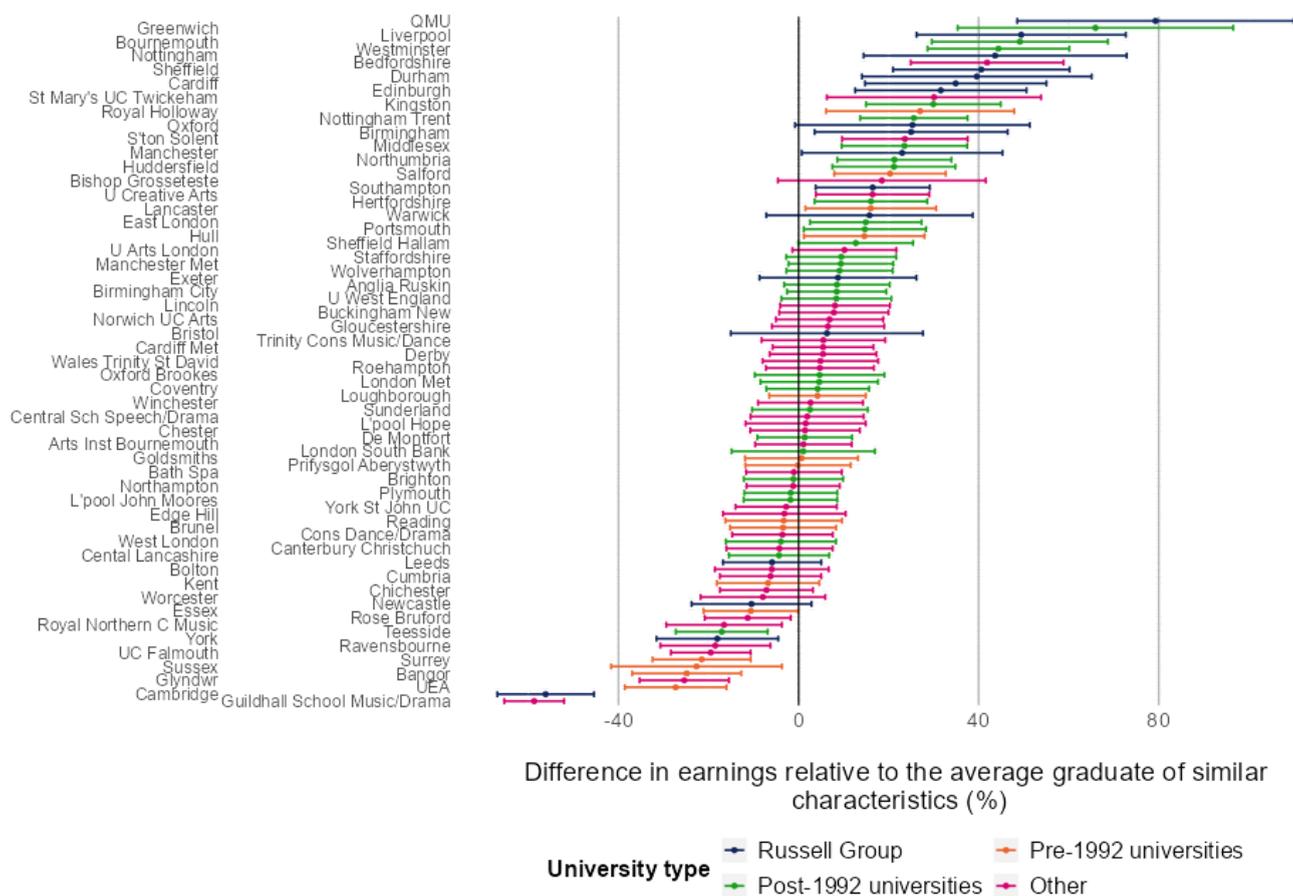
Creative arts value-add for men:

- For men who studied creative arts, the majority of universities have negative value-add and for most of these universities the estimates of a negative value-add are statistically significant.
- Only 2 universities have a statistically significant positive value-add for creative arts subjects, these are Nottingham Trent University and University of Wales Trinity Saint David (*Prifysgol Cymru Y Drindod Dewi Sant*).

- Among those universities with positive value-add, this is lower than the other subjects discussed, with the highest being around 25% difference in earnings compared to the average graduate of similar characteristics.

Figure 30: Estimated value-add in earnings at age 29 by university for women who studied creative arts.

The estimated average earnings difference (in %) relative to a graduate of any subject but with similar background characteristics.



Source: Belfield and others (IFS), 'The impact of undergraduate degrees on early-career earnings', 2018b data. Chart produced by SMC.

Note: QMU = Queen Mary University of London, UEA = University of East Anglia

Creative arts value-add for women:

- More universities have a negative value-add for female graduates for this subject compared to others. However, the majority of value-add estimates are not statistically significantly different from zero.
- Among those universities with positive value-add, this is lower than the other subjects discussed, but higher for female creative arts graduates compared to males.
- Queen Mary University of London appears to have the highest value-add for women, with around 80% higher earnings compared to the average graduate of similar characteristics.

Summary

- For men and women, the subjects with the highest value-add in earnings are medicine and economics.
- Creative arts appear to have the lowest value-add in earnings for men and women.
- For men, some subjects are associated with a negative value-add in earnings, these include subjects such as communications, English, and philosophy.
- For women, none of the subjects reviewed in the literature had an estimated negative value-add.
- Mobility rates look at students who were eligible for FSM who then ended up within the top 20% of earners. Some subjects that have high mobility rates are pharmacology, computing, law, economics, and business. There is a lot of variation in mobility rates depending on the subject and university attended.
- There is also a lot of variation in value-add by subject. However, due to small sample sizes, there is a large margin of error. This means it is hard to confidently identify universities with a statistically significant different value-add for a given subject.

Higher education evidence gaps and limitations

As with any evidence summary, there are limitations to the findings and application of the evidence. This section briefly summarises these limitations and highlights some of the gaps in the current evidence base we have identified.

In this report, we focused only on earnings returns.

To narrow the scope of literature to consider, we have only focused on earnings returns. However, it is worth noting there is also good literature on employment outcomes resulting from studying qualifications in HE. Employment outcomes consider the chance of becoming employed after completing a qualification. We would like to consider these outcomes in the future. Furthermore, other labour market outcomes, such as underemployment, may also have social mobility implications. This may be the case if becoming unemployed can lead to lower future earnings and if this is related to SEB. Moreover, there are factors other than labour market outcomes which may be important to those studying qualifications. These could include wider social and cultural impacts and job and life satisfaction, but these are not captured in the datasets used.

Some studies only focus on the returns based on higher education entrants, rather than graduates.

This means commentary on returns should be interpreted with caution as they will not always be referring to the returns on graduating or completing a particular qualification, rather just attending HE.

While lifetime returns have been predicted in one paper by the Institute for Fiscal Studies, these are only simulations and we do not know life-cycle earnings differentials for certain.⁷⁸

The data only allows us to look up to the age of early 30s, but looking across the life-cycle would more accurately indicate whether going to university has positive returns across an

⁷⁸ Jack Britton and others, '[The impact of undergraduate degrees on lifetime earnings](#)', 2020. Published on IFS.ORG.UKGOV.UK.

individual's entire life. This would be particularly useful given we know there are large differences in trajectories by subject, by institution, and by gender in terms of early career earnings, but this is currently not possible.

The data is looking at a point in time.

Labour market and economic conditions can vary over time and this should be taken into consideration when interpreting the returns. What may be true for past graduates may not be the same for today.

2. Further education

How we approached looking at labour market returns across further education

After completing GCSEs, students in England enter further education (FE) for about 2 years. At the age of 17, around 45% of students begin their A-levels and around 14% study for another type of level 3 qualification.⁷⁹ The remaining students do a lower-level qualification (such as at level 2 or below) and a small percentage start an apprenticeship. By far the most common type of tertiary education is a 3-year full-time university degree (the focus of our HE section) and most students start this at the age of 18 or 19. There is little provision of tertiary education beneath this at levels 4 or 5 (for example, Higher National Certificates or Higher National Diplomas). It is common for individuals to enter such courses at an older age and after they have entered the labour market.

Analysing the FE system could be considered more challenging than higher education (HE) as it is often seen to be more complex and fragmented. This is because there are many more qualification and institution types than in HE. This means for some FE qualifications (such as levels 4 and 5) the number of students is too small to confidently estimate the return to earnings. Furthermore, the FE system has undergone a significant amount of reform (particularly in the past decade), in which many new qualifications have been created and existing qualifications reformed. To allow for a system-wide analysis, there are 2 common approaches used to understand the returns from studying FE qualifications. One is to look at each FE qualification type individually (such as an apprenticeship or a BTEC).⁸⁰ The other is to look at qualifications through their levels (such as level 4). As most of the literature we reviewed looked at FE qualifications by level, we chose to use this perspective. However, on occasion we may have made a reference to a study which looked at qualification types.

Another challenge is how age is considered. There can be a lot more variability in the circumstances under which someone studies a qualification in FE than in HE. For example, you

⁷⁹ Claudia Hupkau, Sandra McNally, Jenifer Ruiz-Valenzuela, and Guglielmo Ventura, '[Post-compulsory education in England: choices and implications](#)'. Published on CAMBRIDGE.ORG.

⁸⁰ A practical, vocational qualification originally set up by the Business and Technology Education Council.

could have an individual studying a level 4 FE qualification straight out of school at the age of 18 or during their 30s when hoping to upskill or reskill in order to change careers. Therefore, we focused our review on young people to help make comparisons across the literature and since they are the focus of our Action 53 commitment.

Although we focused on value-add in earnings, for some FE qualifications in some cases earnings may be less important than getting people into employment in the first place. This could be the case for some FE courses which may appear low in value-add due to low earnings but have high employability rates, such as social care.

What are the levels of qualifications?

There are 9 qualification levels in England. The HE literature we reviewed focused on university degrees at level 6. For FE, most of the literature we reviewed focused on levels 2 to 5.

Table 1: Examples of types of qualifications for different levels.

| Level | Types of qualifications |
|-------------|--|
| Entry level | Entry-level essential skills, functional skills and skills for life |
| 1 | GCSE grades: 1 to 3 Level 1 functional and essential skills |
| 2 | GCSE grades: 4 to 9 Intermediate apprenticeship |
| 3 | A-levels AS levels Advanced apprenticeships Level 3 diploma, national certificate Level 3 National Vocational Qualification (NVQ) |
| 4 | Certificate of higher education (CertHE) Higher apprenticeship (level 4) Higher national certificate (HNC) Level 4 diploma, national certificate Level 4 National Vocational Qualification (NVQ) |
| 5 | Diploma of higher education (DipHE) Foundation degree Higher National diploma Higher apprenticeship (level 5) Level 5 diploma, national certificate |

| | |
|---|---|
| | Level 5 National Vocational Qualification (NVQ) |
| 6 | University degree with honours (such as a bachelor of arts (BA hon) or bachelor of science (BSc hon)) Degree apprenticeship Ordinary degree without honours Graduate diploma Level 6 diploma, national certificate Level 6 National Vocational Qualification (NVQ) |
| 7 | Master's degree (master of arts (MA) or master of science (MSc)) Postgraduate certificate in education (PGCE) Postgraduate diploma Level 7 diploma, national certificate Level 7 National Vocational Qualification (NVQ) |
| 8 | PhD (doctor of philosophy) Level 8 diploma |

Source: Department for Education.⁸¹

⁸¹ Department for Education, '[What qualification levels mean](#)', (accessed 2023). Published on GOV.UK.

The labour market returns associated with studying in further education

Higher-level qualifications are associated with positive earnings differentials when compared to level 3 qualifications in FE. Espinoza and others (2020)⁸² suggest that all higher-level qualifications have a positive association with earnings relative to level 3 qualifications.⁸³ This is a descriptive study that includes controls but does not claim to identify a causal impact. It should be noted that few people in England study qualifications at levels 4 and 5 and it may be more difficult to control for selection convincingly than when studying earnings differentials to level 6 qualifications (a more common route). Furthermore, levels 4 and 5 cover a more limited set of subjects than level 6 (some of which may be tied to occupational licensing). Like the studies on level 6 qualifications, this study also shows large variations in earnings differentials across the various qualifications and by gender.

Figure 31 shows the estimated percentage increase associated with studying a qualification of a given level, relative to the earnings of a level 3 qualification. The study finds that for men at age 26, the highest average earnings differential is at level 4. The average earnings of men aged 26 at level 4 are 42% above those who have (at most) level 3 qualifications. For women at age 26, there is a particularly high earnings differential at level 5, with their average earnings being 57% above those with (at most) level 3 qualifications. Overall, level 6 (the equivalent level to a bachelor's degree) also corresponds to a positive value-add relative to a level 3 qualification. When compared to people of similar characteristics, the earnings differential at that age is lower than that for males completing level 4 and females completing level 5.

As discussed above, only a relatively small number of individuals undertake level 4 and 5 qualifications in England, and they tend to be concentrated in particular sectors (such as construction for men and nursing for women). Level 6 qualifications cover a much wider range of subjects and courses. Furthermore, the gap between these qualifications reduces at age 30. This may be because those with HE qualifications experience a more rapid increase in their earnings in their 30s than those with FE qualifications.⁸⁴ This may imply that the value-add from

⁸² Héctor Espinoza and others, '[Post-18 education: who is taking different routes and how much do they earn?](#)', 2020. Published on CENTRE FOR ECONOMIC PERFORMANCE LSE.AC.UK.

⁸³ Note, apprenticeships were excluded from the study.

⁸⁴ Jack Britton and others, '[The impact of undergraduate degrees on lifetime earnings](#)', 2020. Published on IFS.ORG.UK.

a HE qualification could potentially overtake that of a level 4 or 5 FE qualification at later ages. However, FE earnings data which goes further into the future would be required to study this.

Increasing the level of your qualification increases your returns. Patrignani and others (2017) look at earning returns by type of qualification from level 1 to level 4. Their results are shown in Figures 32 and 33 for men and women respectively. These findings suggest that, on average, doing a qualification of a higher level above your current level is associated with a positive value-add in earnings.⁸⁵ This is achieved by comparing people who have attained a qualification of a given level to those with similar characteristics (including prior attainment) but who have attained a qualification of the level above.⁸⁶ This effect is particularly large for the jump to level 4 vocational qualifications, apprenticeships, and National Vocational Qualifications (NVQ) at level 3 and 2.

Intermediate and advanced apprenticeships have a positive effect on earnings compared to other vocational level 2 and 3 qualifications. Cavaglia and others (2020) find a positive effect on earnings from doing a level 2 or level 3 apprenticeship compared to those of the same (highest) educational level but achieved in a classroom setting. Their results are shown in Figure 34. However, the increase in earnings varies a lot by sector. Overall, women are more likely than men to choose sectors with lower earnings (such as social care). This results in apprenticeships having a higher impact on earnings for men than for women. The earnings returns are larger for a level 3 than a level 2 apprenticeship and persist to at least age 28.⁸⁷

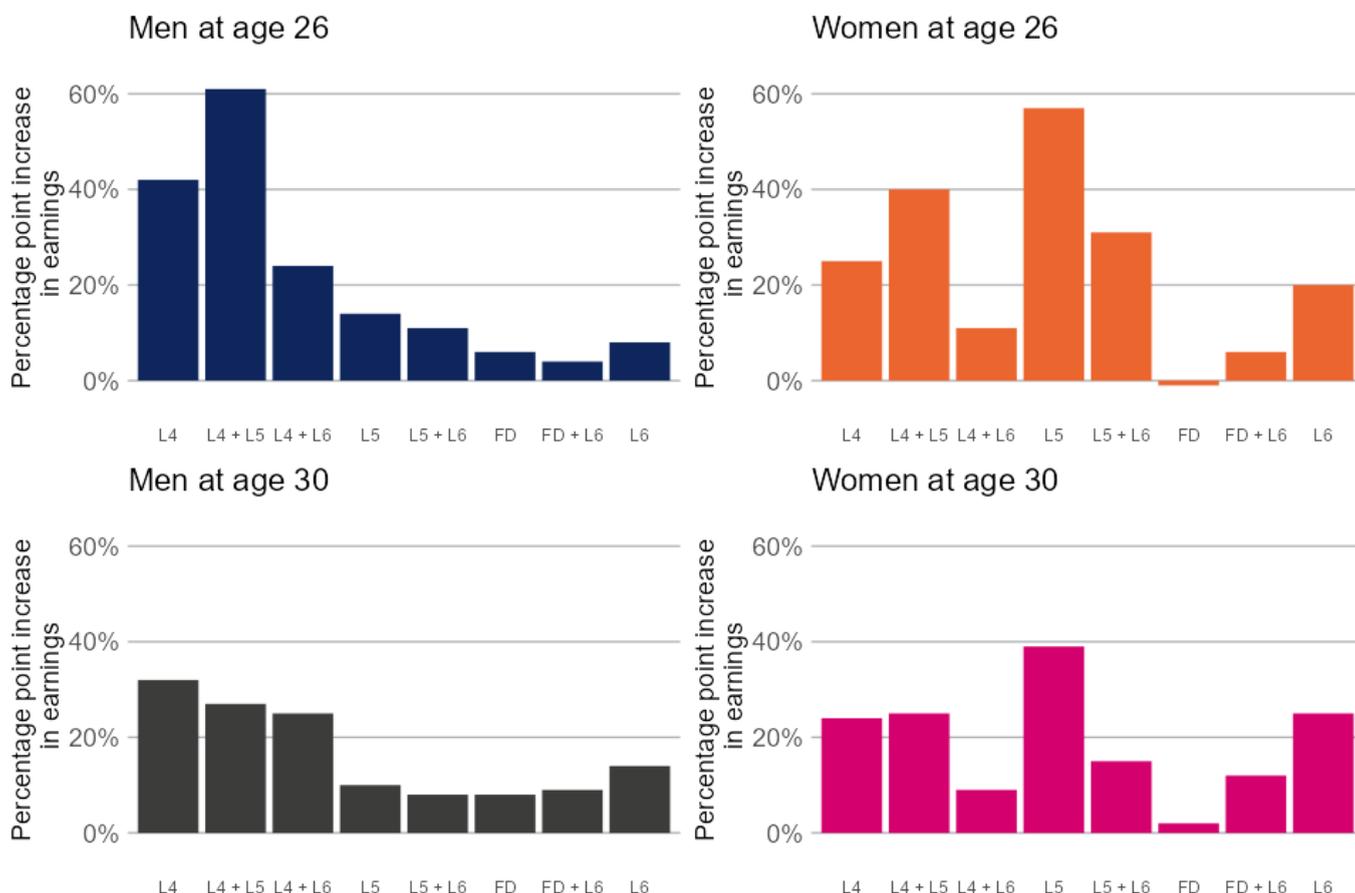
⁸⁵ Pietro Patrignani and others, '[The earnings differentials associated with vocational education and training using the Longitudinal Education Outcomes data](#)', 2017. Published on CENTRE FOR ECONOMIC PERFORMANCE LSE.AC.UK.

⁸⁶ Other factors controlled for include: ethnic origin, time elapsed since leaving education, free school meals eligibility, special education needs status, and Income Deprivation Affecting Children Index (area deprivation score).

⁸⁷ Chiara Cavaglia and others, '[Do apprenticeships pay? Evidence for England](#)', 2020. Published on OXFORD BULLETIN OF ECONOMICS AND STATISTICS ONLINELIBRARY.WILEY.COM.

Figure 31: Earnings by level at age 26 and 30 in FE.

Percentage difference in earnings relative to the earnings of someone of similar characteristics who studied a level 3 qualification.

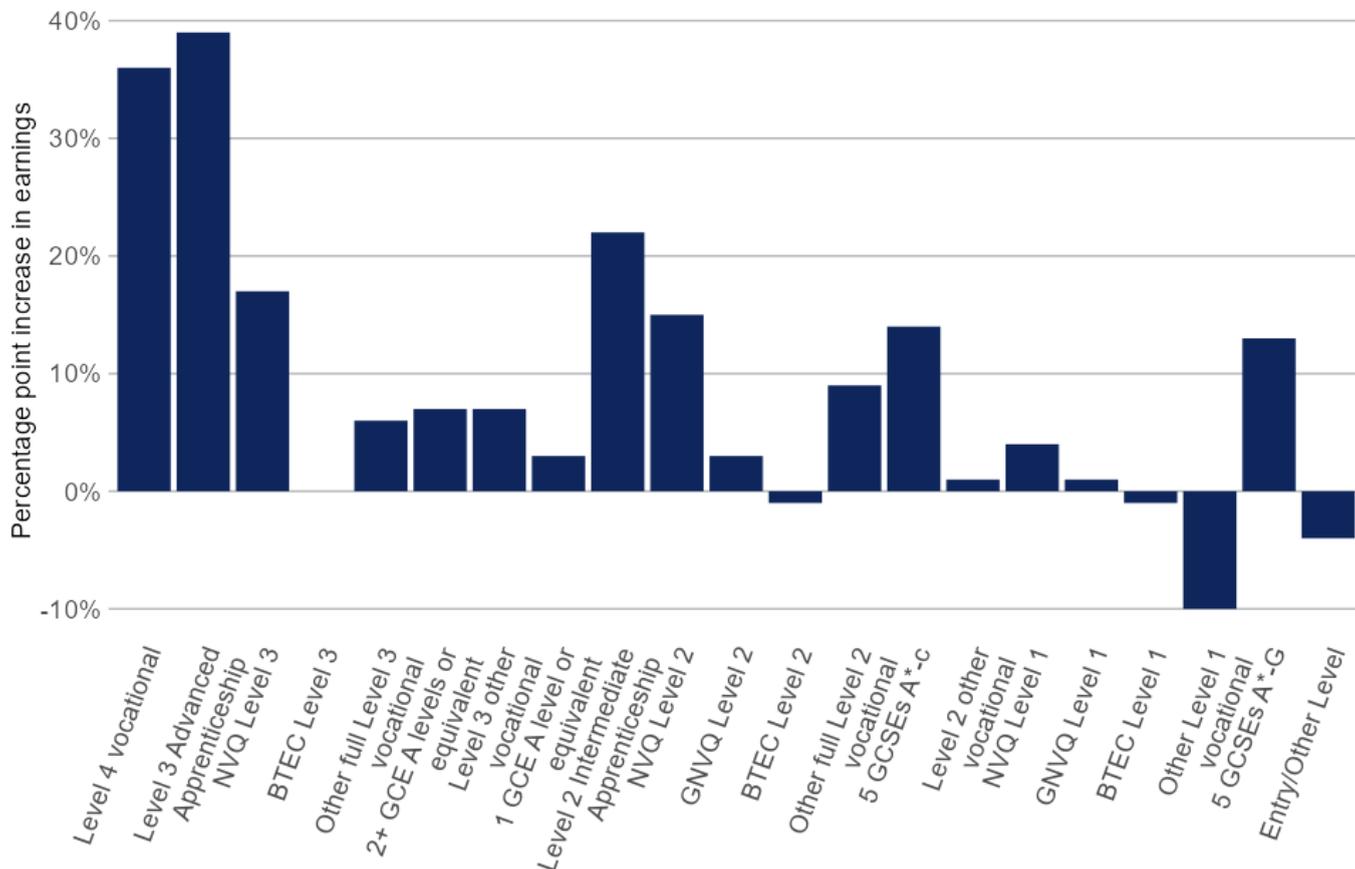


Source: Espinoza and others (CVER), 'Post-18 education: who is taking different routes and how much do they earn?', 2020. Data taken from the conditional regression specification from Table 5 for age 26 and Table 6 for age 30. Chart produced by SMC, units have been converted from logs to percentage points.

Note: L = Level. FD = Foundation Degree. To match the interpretation of the coefficients by the authors we use the mathematical transformation of log units into percentage points. This involves taking the exponent of the log value and subtracting one before multiplying by 100 to convert to percentage points. Not all estimates are statistically significant at the 5% level. For women at age 26, the coefficient for FD is not significant. For women at age 30, the coefficients on L4 + L5 and FD are not significant. For men at age 26 and for men at age 30 all coefficients are significant.

Figure 32: Earnings by level and type of qualification at age 26 in FE for men.

Percentage difference in earnings relative to the earnings of someone of similar characteristics who studied a qualification at the level below.



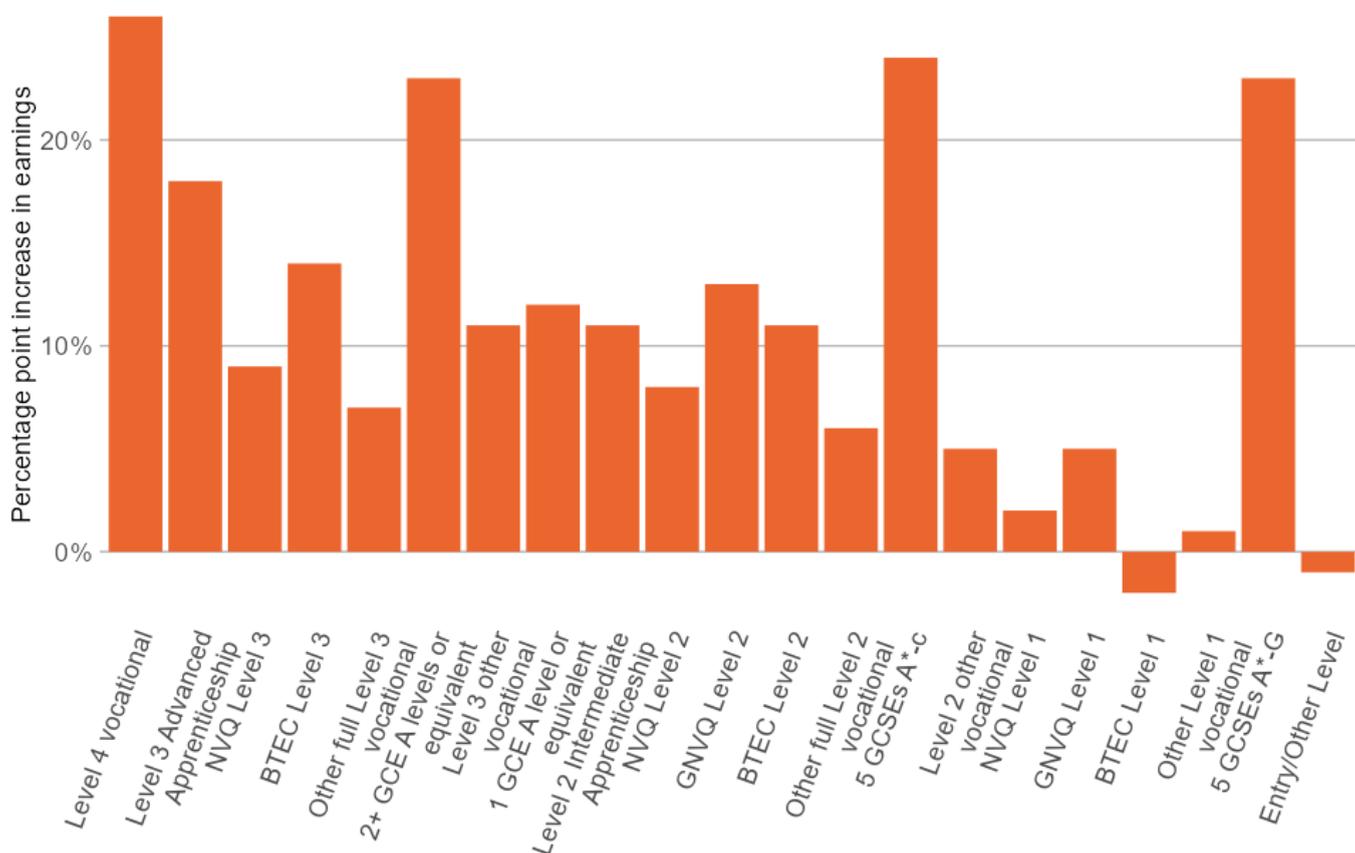
Source: Patrignani and others (CVER), ‘The earnings differentials associated with vocational education and training using the Longitudinal Education Outcomes data’, 2017 data. Data taken from the augmented plus regression specification for counterfactual 1 from Table 8a and 8b.

Chart produced by SMC, units have been converted from logs to percentage points.

Note: NVQ = National Vocational Qualification, GNVQ = General National Vocational Qualification. To match the interpretation of the coefficients by the authors we use the mathematical transformation of log units into percentage points. This involves taking the exponent of the log value and subtracting one before multiplying by 100 to convert to percentage points. Not all estimates are statistically significant at the 5% level. The following coefficients are not significant: BTEC level 3, BTEC level 2, level 2 other qualification, NVQ level 1, GNVQ level 1, BTEC level 1, other level 1 vocational.

Figure 33: Earnings by level and type of qualification at age 26 in FE for women.

Percentage difference in earnings relative to the earnings of someone of similar characteristics who studied a qualification at the level below.

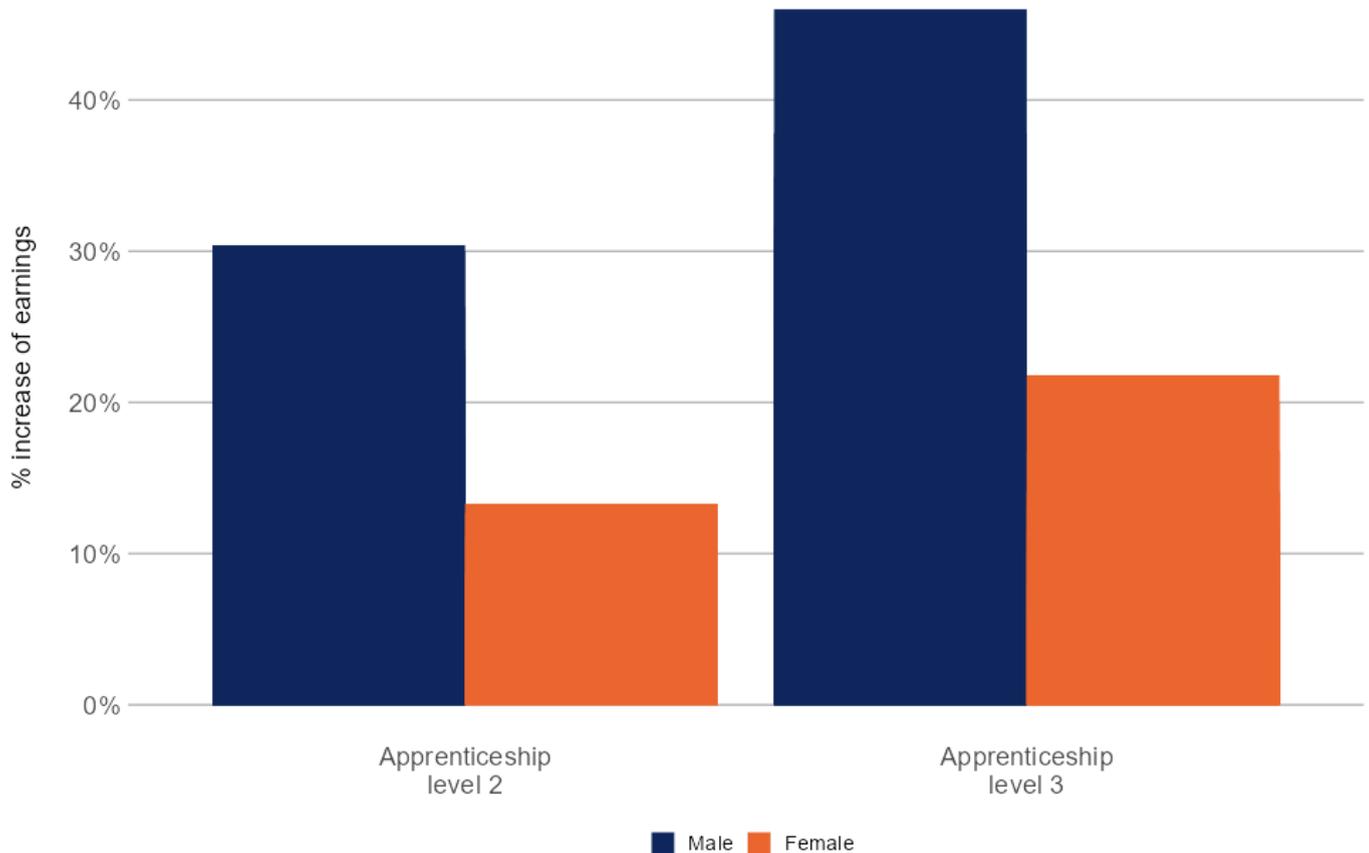


Source: Patrignani and others (CVER), 'The earnings differentials associated with vocational education and training using the Longitudinal Education Outcomes data', 2017 data. Data taken from the augmented plus regression specification for counterfactual 1 from Table 9a and 9b. Chart produced by SMC, units have been converted from logs to percentage points.

Note: NVQ = National Vocational Qualification, GNVQ = General National Vocational Qualification. To match the interpretation of the coefficients by the authors we use the mathematical transformation of log units into percentage points. This involves taking the exponent of the log value and subtracting one before multiplying by 100 to convert to percentage points. Not all estimates are statistically significant at the 5% level. The following coefficients are not significant: NVQ level 1, GNVQ level 1, BTEC level 1, other level 1 vocational and entry/other level.

Figure 34: Earning for apprenticeships at age 23.

Percentage difference in earnings of an apprenticeship relative to someone of similar characteristics who studied a classroom-based qualification of the same level.



Source: Cavaglia and others (CVER), 'Do apprenticeships pay? Evidence for England', 2020 data. Chart produced by SMC. Data taken from the 2SLS column in Table 5. Chart produced by SMC, units have been converted from logs to percentage points.

Note: To match the approach used by the authors in the paper, we use a simple approach of interpreting the log values into percentage points. This means a coefficient of 0.3 would equate to an effect size of 30%. The coefficient for women at level 2 is not statistically significant at the 5% level.

How do returns vary by institution characteristics?

Some evidence suggests that there is variation in returns by institution. Aucejo and others (2020) find that earnings would improve by around 3% and 1.5% for young and adult learners respectively if they moved from a college ranked at the bottom 15% of the college value-added distribution to one ranked in the top 15%.⁸⁸

There is a positive association between higher earnings and courses in FE colleges that offer classroom-based teaching and competency-based qualifications. Aucejo and others (2020) find that those FE colleges that offer a larger proportion of their courses in the classroom are associated with a higher value-add in earnings for young learners. In addition, colleges offering competency-based assessed qualifications instead of exam-assessed lead to lower value-add in earnings for students.⁸⁹ However, it is unclear how this finding relates to apprenticeships. Further research to understand the relationship between institution, teaching type and value-add is required.

How do returns vary by subject area of study?

There are significant challenges with interpreting the evidence on returns by subject of qualification. Returns can vary a lot by qualification type within a subject area. Furthermore, sample sizes can be quite small for some subject areas at some qualification levels. It can be difficult to know what the counterfactual would really be for individuals pursuing such FE courses. Additionally, men and women tend to have different earnings outcomes and choose to study in different subject areas. Some differences in outcomes observed could be due to individual characteristics rather than the subject of study itself.

With caution, there is some research which has looked at the value-add by subject area. Aucejo and others (2020) find that the sectors with a higher value-add are engineering for men and business administration and law for women.⁹⁰ There are also high relative returns for young women in arts and media. Their findings for earnings by subject area are shown in Figures 35

⁸⁸ Esteban Aucejo and others, '[Where versus What: college value-added and returns to field of study in further education](#)', 2020. Published on CENTRE FOR ECONOMIC PERFORMANCE LSE.AC.UK.

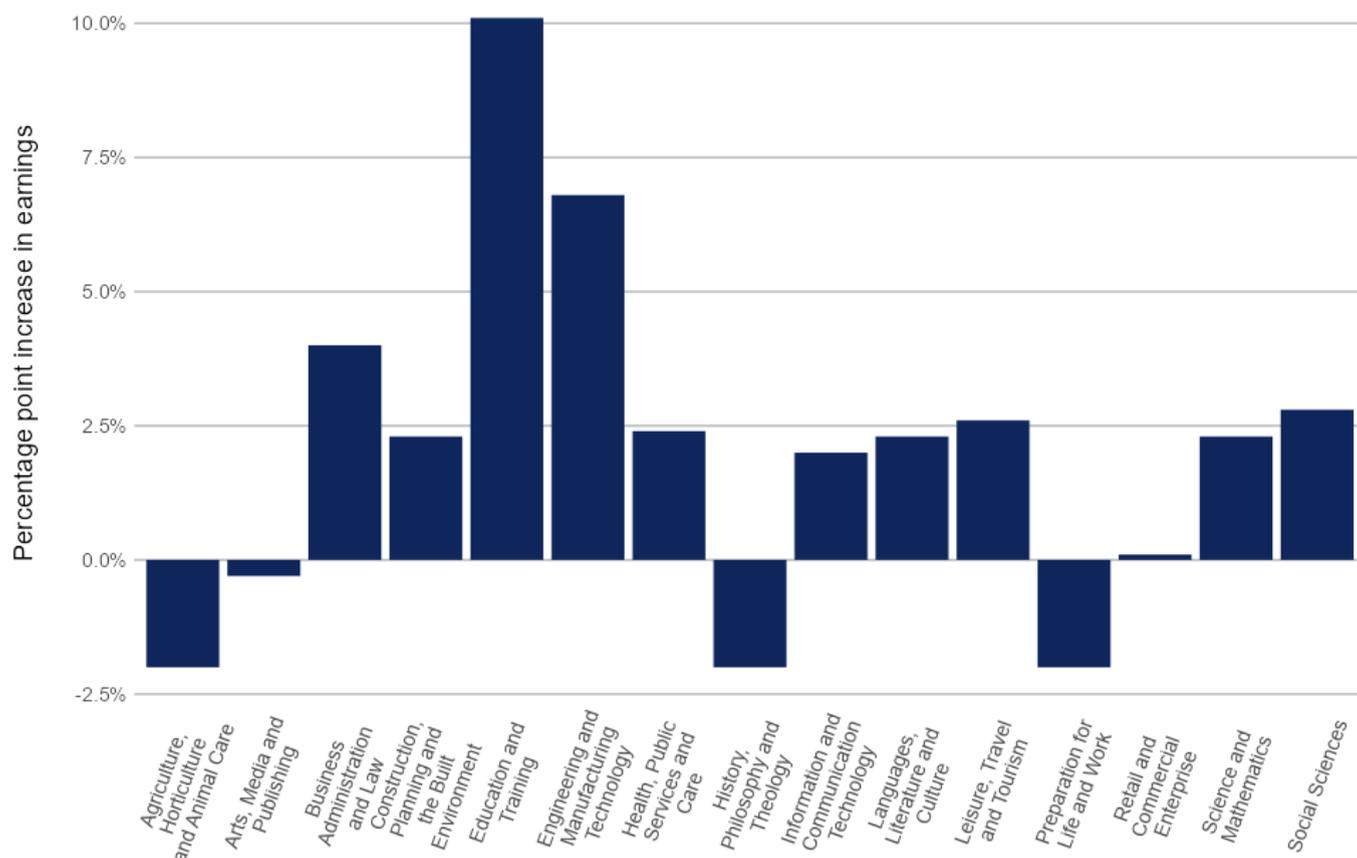
⁸⁹ Esteban Aucejo and others, '[Where versus what: college value-added and returns to field of study in further education](#)', 2020. Published on CENTRE FOR ECONOMIC PERFORMANCE LSE.AC.UK.

⁹⁰ Esteban Aucejo and others, '[Where versus what: college value-added and returns to field of study in further education](#)', 2020. Published on CENTRE FOR ECONOMIC PERFORMANCE LSE.AC.UK.

and 36 for men and women respectively. A hypothesis could be that the arts and media sector have relatively well-established qualifications which are recognised by employers. These tend to be at a higher level and correspond to higher returns. However, this is only a hypothesis and further research would be required. It is worth noting that this study only focuses on overall FE earnings returns by industry related to the qualification studied and not the industry worked in. Overall, there are large variations in earning returns by field of study, particularly among females.

Figure 35: Earnings for field of study 5 years after studying in FE for men.

Percentage difference in earnings for the field study relative to the average person of similar characteristics who did not study a subject in that field.

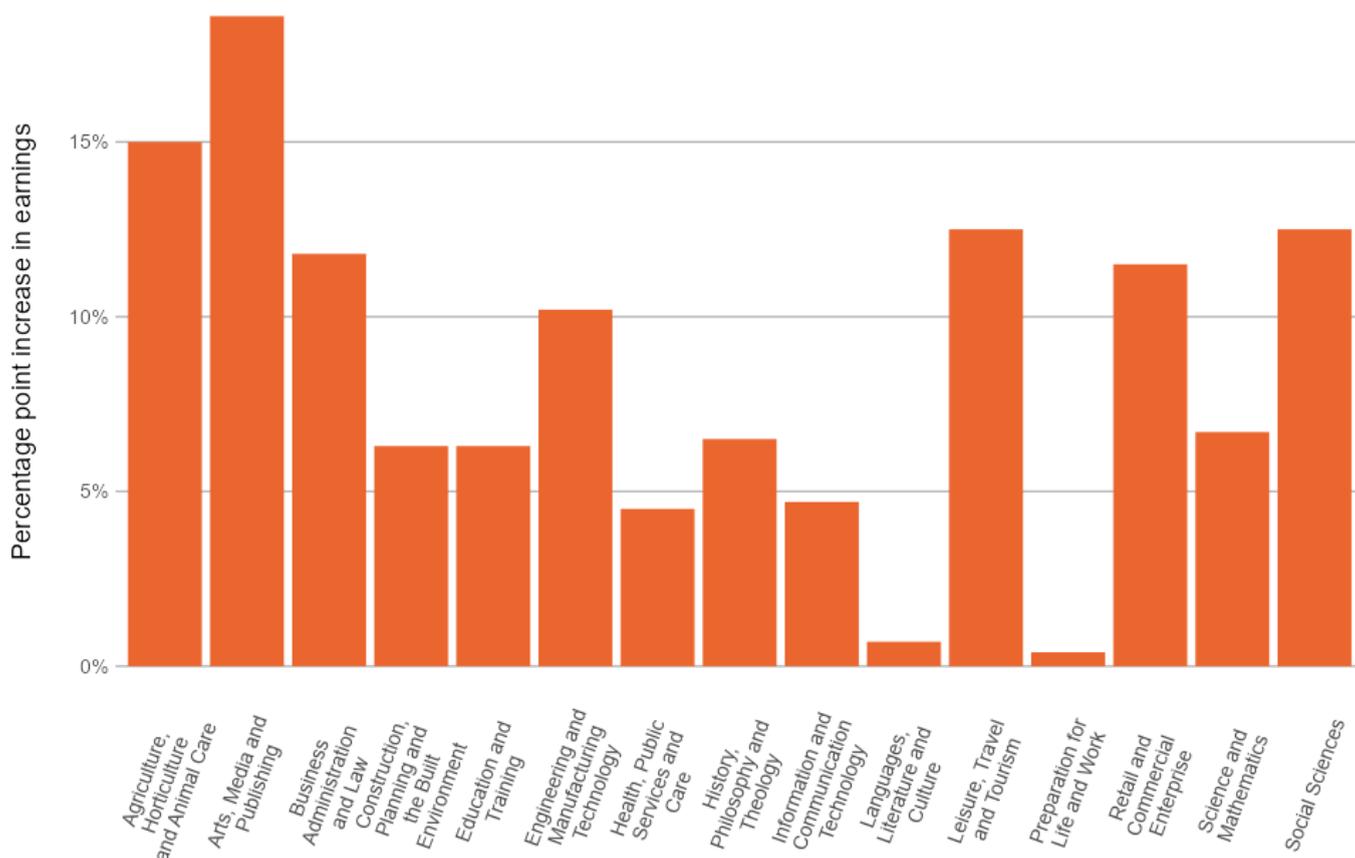


Source: Aucejo and others (CVER), 'Where versus what: college value-added and returns to field of study in further education', 2020 data. Data taken from column 7 in Table 7 for males who are young learners. Chart produced by SMC.

Note: Young learners are aged 16-20 when first enrolling in FE colleges. Not all estimates are significant at the 5% level. The regression specification used by the authors to estimate the returns 5 years after studying in FE is called specification 3.

Figure 36: Earnings for field of study 5 years after studying in FE for women.

Percentage difference in earnings for the field study relative to the average person of similar characteristics who did not study a subject in that field.



Source: Aucejo and others (CVER), 'Where versus what: college value-added and returns to field of study in further education', 2020 data. Data taken from column 7 in Table 9 for females who are young learners. Chart produced by SMC.

Note: Young learners are aged 16-20 when first enrolling in FE colleges. Not all estimates are significant at the 5% level. The regression specification used by the authors to estimate the returns 5 years after studying in FE is called specification 3.

There is some evidence on the returns associated with studying an apprenticeship. Cavaglia and others (2020) focus on level 2 and 3 apprenticeship earning returns by sector after

controlling for other factors.^{91 92} Similarly to other qualifications in FE, the results show that there is a lot of variability in the earnings between sectors. As with Acuejo and others (2020), this also has important implications for the gender earnings gap because of the different choices in sectors made by men and women. For men at age 23, the highest return for level 3 apprenticeships is in engineering followed by transportation. For women, it is creative arts and design, followed by animal care and veterinary.

Summary

- Doing a qualification the level above your current level is associated with a positive value-add in earnings. This may imply that working your way up the qualification ladder is associated with higher future earnings.
- Level 2 and 3 apprenticeships appear to have a better impact on earnings compared to other vocational level 2 and 3 qualifications. However, this varies by sector and gender. Women are more likely to choose sectors with lower earnings, such as social care.
- There is some evidence to suggest the FE institution a student goes to has an effect on earnings returns. For example, FE colleges ranked in the top 15%, that offer a larger proportion of their courses in the classroom or exam-assessed qualifications are associated with higher value-add.
- As we found in HE, different subjects also have different earnings returns in FE. For example, sectors with higher value-add include engineering for men and business administration, law, and arts and media for women.

⁹¹ Chiara Cavaglia and others, '[Do apprenticeships pay? Evidence for England](#)', 2020. Published on OXFORD BULLETIN OF ECONOMICS AND STATISTICS ONLINELIBRARY.WILEY.COM.

⁹² Controls include: demographic characteristics (White British, English as first language, eligible for free school meals, IDACI score), prior attainment in key stage 2 (age 10), prior attainment in key stage 4 (age 16), secondary school and cohort fixed effects, amount of highest vocational studies (guided learning hours associated to the qualification) and local unemployment rate.

Further education evidence gaps and limitations

We have identified some evidence gaps and limitations of the evidence on FE. The scope of this review is quite narrow, so some of these gaps and limitations may not be applicable to the broader evidence base on FE.

- There appears to be an evidence gap on the FE returns later in life (after age 30). This is similar to the gap in HE in which the returns are not observed later on because background characteristics are only available for those in the school system from 2002 onwards. There are some studies that consider returns for adults using longitudinal surveys such as the National Child Development Survey (individuals born in 1958) and the British Cohort Survey (individuals born in 1970). Brunello and Rocco (2017) use these surveys to compare the returns to vocational and academic (or general) education over the life-cycle.⁹³
- Understanding returns in FE is also challenging because a qualification is often a stepping stone to another qualification. So it is unclear how to attribute someone's future earnings to a given qualification if they had studied multiple times.
- In more recent times (since about 2017), higher and degree apprenticeships have become more prevalent. An interesting question for future research is whether these lead to good employment and earnings prospects relative to the counterfactual.
- At the moment we cannot observe the sector in which someone who completed an FE qualification actually works in. However, the Longitudinal Educational Outcomes dataset is expected to be updated in the future to include sector data.
- The returns of studying FE for those aged 16 to 19 years might be different to those adult learners who return to education, such as a 40 year old that undertakes an FE qualification to reskill. More research is needed to understand to what extent returns depend on the age people undertake the courses and other aspects of their circumstances.⁹⁴ We are aware there is an international evidence base on the returns to education and training later in life, which may show that training can be effective in

⁹³ Giorgio Brunello and Lorenzo Rocco, '[The labour market effects of academic and vocational education over the life cycle: evidence based on a British cohort](#)', 2017. Published on UNIVERSITY OF CHICAGO PRESS JOURNALS.EDU.

⁹⁴ Esteban Aucejo and others, '[Where versus what: college value-added and returns to field of study in further education](#)', 2020. Published on CENTRE FOR ECONOMIC PERFORMANCE LSE.AC.UK.

different contexts. For example, one UK study considers the availability of training (more than 50 hours) by industry and region over time and for different education groups.⁹⁵

They find that training can play a role in reducing the wage gap arising from part-time work, especially for women who had only completed secondary school level education.

- There appears to be an evidence gap on how the returns associated to FE colleges vary by location or type (such as urban versus rural settings). A key question may be whether the concentration of an FE system in an area can affect outcomes. For example, does having local competition in FE providers improve the quality of education or does having a more established FE system in an area improve its link and familiarity to employers and so increase employment rates and earnings?
- Employers' perceptions of the FE system and courses might shape the returns to specific courses, but there may be an evidence and data gap on how employers perceive the FE system.
- Fundamentally, it is not well understood what is driving the variation in returns. Although we can observe earnings differentials for FE qualifications, it is not necessarily clear what aspects of a given qualification are causing the higher returns to be observed.
- Furthermore, the large amount of reform in the FE sector makes its labour market outcomes harder to study. This is because as FE courses and qualifications keep changing, courses which existed 10 years ago may have ceased to exist or have different names. This makes it difficult to track the outcomes of the course over time. Moreover, as the courses and qualifications undergo reform, the labour market outcomes corresponding to a course may be less relevant. For example, the outcomes related to studying a level 3 apprenticeship 10 years ago may be far less relevant to understanding the outcomes of someone studying a level 3 apprenticeship today.
- Finally, as the FE system is much more fragmented than HE, detailed analysis of a certain pathway is harder to do since sample sizes may be too small for analysis and the findings may be too specific to a certain pathway in order to understand value-add for FE overall.

⁹⁵ Richard Blundell and others, '[Wages, experience, and training of women over the life cycle](#)', 2021. Published on UNIVERSITY OF CHICAGO PRESS JOURNALS.EDU.

3. Data quality

Summary of data quality across both higher education and further education

Overall the quality of administrative data appears to be good for making useful estimates of the historic value-added returns associated with studying for a qualification. We note that the individuals observed are young and it is likely that returns will change as they progress through their 30s and 40s. To narrow our scope, most of the research we reviewed uses the Longitudinal Educational Outcomes (LEO) dataset. LEO is a dataset that is the first of its kind in England to collect and link administrative data on school attainment, grades, post-16 education and earnings for pupils born from 1986 onwards.

DfE provides the below description of LEO:

The LEO dataset links information about students, including

- personal characteristics such as sex, ethnic group and age
- education, including schools, colleges and higher education institution attended, courses taken and qualifications achieved
- employment and income
- benefits claimed

It is created by combining data from the following sources:

- the National pupil database (NPD), held by the Department for Education (DfE)
- Higher Education Statistics Agency (HESA) data on students at UK publicly funded higher education institutions and some alternative providers, held by DfE
- Individualised Learner Record data (ILR) on students at further education colleges, held by DfE
- employment data (P45 and P14), held by Her Majesty's Revenue and Customs (HMRC)
- the National Benefit Database, Labour Market System and Juvos data, held by the Department for Work and Pensions (DWP)

Source: Department for Education, 2017.⁹⁶

We have summarised some of the advantages and disadvantages of using LEO data below:

⁹⁶Department for Education, '[Employment and earnings outcomes of higher education graduates by subject and institution: experimental statistics using the Longitudinal Education Outcomes \(LEO\) data](#)', 2017. Published on ASSETS.PUBLISHING.SERVICE.GOV.UK.

Advantages of LEO data

- **Population-level data:** LEO is derived from administrative datasets, and it covers the entire population of pupils and students in England from 2002. However, it does not fully capture those going to independent schools. The LEO dataset is not a survey and therefore less prone to selection bias. Selection bias occurs when a certain group of people are more likely to complete or opt-out of a survey resulting in a sample that is not representative of the wider population.
- **Large sample size:** Due to its administrative nature the sample sizes for LEO are very large. This enables the study of outcomes by subject and university combination, which is harder to do with survey-based data.
- **Can be linked to other datasets:** LEO can be linked to other datasets such as from the Office of Qualifications and Examinations Regulation (Ofqual) data on actual test scores (instead of just looking at grades) and re-grading requests. It can also be linked to the Universities and Colleges Admissions Service (UCAS) data on applications and potentially National Health Service (NHS) data. There are many possibilities for data linkage which could facilitate future research. Linking datasets to each other can allow a researcher to explore the relationship between variables in the separate datasets. For example, linking NHS data to UCAS data may allow future research into the relationship between health and university admissions.
- **Covers a full picture of the educational experience for England and transition into the labour market:** The LEO dataset links school, college, and university data together and then combines this with earnings and employment data from His Majesty's Revenue and Customs.

Limitations of LEO data

- **Annual earnings data only:** The LEO dataset includes only annual earnings, and there is no measure of hours worked or hourly earnings. This limits any investigation of productivity, which relies typically on hourly wages. It is particularly problematic for understanding female labour market outcomes as women are more likely to work part-time. Additionally, 'sustained employment' is an imperfect measure. However, this may help overcome challenges posed by observing earnings of someone who may have high wages but only worked for a portion of the year.

- **No information on employer or occupation:** This data is currently not available in LEO, so we cannot observe what type of jobs people are taking after studying for a given qualification. This is limiting in FE as we have less information on why certain subjects have higher earnings. It is unclear the extent to which those who study for a specific qualification go on to work in the corresponding sector.
- **Missing information on pupils who attend private schools:** There is some key school-level and demographic information missing for pupils who attended independent schools because these schools do not have to complete a pupil census (which gives information such as ethnicity and free school meal (FSM) eligibility). Independent schools are captured in the key stage 4 (KS4) and key stage 5 (KS5) results tables, so we can include these pupils in the analysis. Since privately educated pupils represent 7% of the population and tend to be those most advantaged, there is a limit to how much we can use LEO to understand social mobility. However, the studies from the Institute for Fiscal Studies that we considered (such as Belfield and others, 2018) included a control for those who attended independent schools by using an indicator derived from KS4 and KS5 results data.
- **Only covers pupils born from 1986:** We cannot yet observe a career-wide picture of labour market outcomes as survey data is for those around 36 years old. This means we do not yet know the lifetime earnings outcomes of individuals who study a given qualification or subject. This is important because labour market returns likely continue to evolve as people age beyond what we can observe in the data. A snapshot of returns when people are young does not represent how returns will look over the whole working life. However, this problem will lessen over time as the earlier cohorts age.
- **Getting access is not straightforward:** Only accredited researchers can apply to the Office for National Statistics Secure Research Service with a research proposal. Their proposal must explain which specific data they require, so the research questions and analyses need to be planned well in advance.

In the future it may be possible to improve analysis by using the Grading and Admission data for England.⁹⁷ This is a new data-sharing project which links data from UCAS, Ofqual, the Department for Education and the Office for Standards in Education, Children's Services and Skills (Ofsted). This may allow future research to look into which universities and colleges people have applied for, whether they received an offer, met the offer requirements and

⁹⁷ Ofqual, '[GRADE data sharing project](#)', 2021. Published on GOV.UK.

proceeded to study there. This could enable improved estimates of value-add, which would be less prone to the limitations resulting from being unable to observe individual characteristics such as ability, motivation and personality. This type of data is more commonly used in US studies on the returns to higher education.

Conclusions and next steps

This report was designed to develop our understanding of the evidence to help inform how we can proceed to meet our Inclusive Britain Action 53 commitment. As we consider next steps, with the ultimate goal of improving the information available to young people about the labour market value of qualifications, it is important to consider the findings from this report.

The research suggests that, on average, studying a qualification in both higher education (HE) or further education (FE) is associated with positive earnings returns. However, it also showed there is a lot of variation in value-add across subjects, with science, technology, engineering, and maths (STEM) subjects as well as economics and law generally being associated with higher earnings. In HE, there is also a lot of variation in returns by university type: more selective universities (such as the Russell Group) tend to have a higher value-add, while less selective universities (such as the post-1992 group) tend to have a lower value-add. However, on average, the more selective universities also tend to be disproportionately less accessible to pupils from lower socio-economic backgrounds (SEB). Students from a lower SEB tend to choose less selective universities and courses than students with similar grades from more privileged backgrounds.

In FE, there is little evidence on how returns may vary by institution type. However, there is some evidence on returns by subject type. Subjects such as engineering for men and business administration and law for women tend to have a higher value-add. The evidence also suggests that higher-level qualifications are associated with positive earning differentials when compared to level 3 qualifications.

Next steps

- Value-add appears to be a useful metric for understanding a student's prospects from studying a given course at a given institution. We will look into pointing prospective students towards these statistics or providing them with a summarised and accessible version of value-add by subject and university. This could help meet our Action 53 commitment from the Inclusive Britain report.⁹⁸
- We will advocate for the inclusion of occupational data such as Standard Occupational Classification in the Longitudinal Educational Outcomes datasets. This would improve our understanding of the types of jobs people get after completing their qualification. If collected over a long period of time, this gives insight into the career trajectories that people of various qualifications from different institutions experience.
- We have conducted a survey to collect information on which information sources young people find most useful when deciding what courses and qualifications they want to study. The results from the survey will inform how we can build on the evidence in this report to develop high-quality information and guidance for young people.

⁹⁸ Department for Levelling Up, Housing and Communities and Race Disparity Unit, '[Inclusive Britain: summary of recommendations and actions](#)', 2022. Published on GOV.UK.

Annex

Methodology used by the Institute for Fiscal Studies to estimate higher education returns

When estimating the value-add in earnings, Belfield and others (2018b) control for the following:⁹⁹

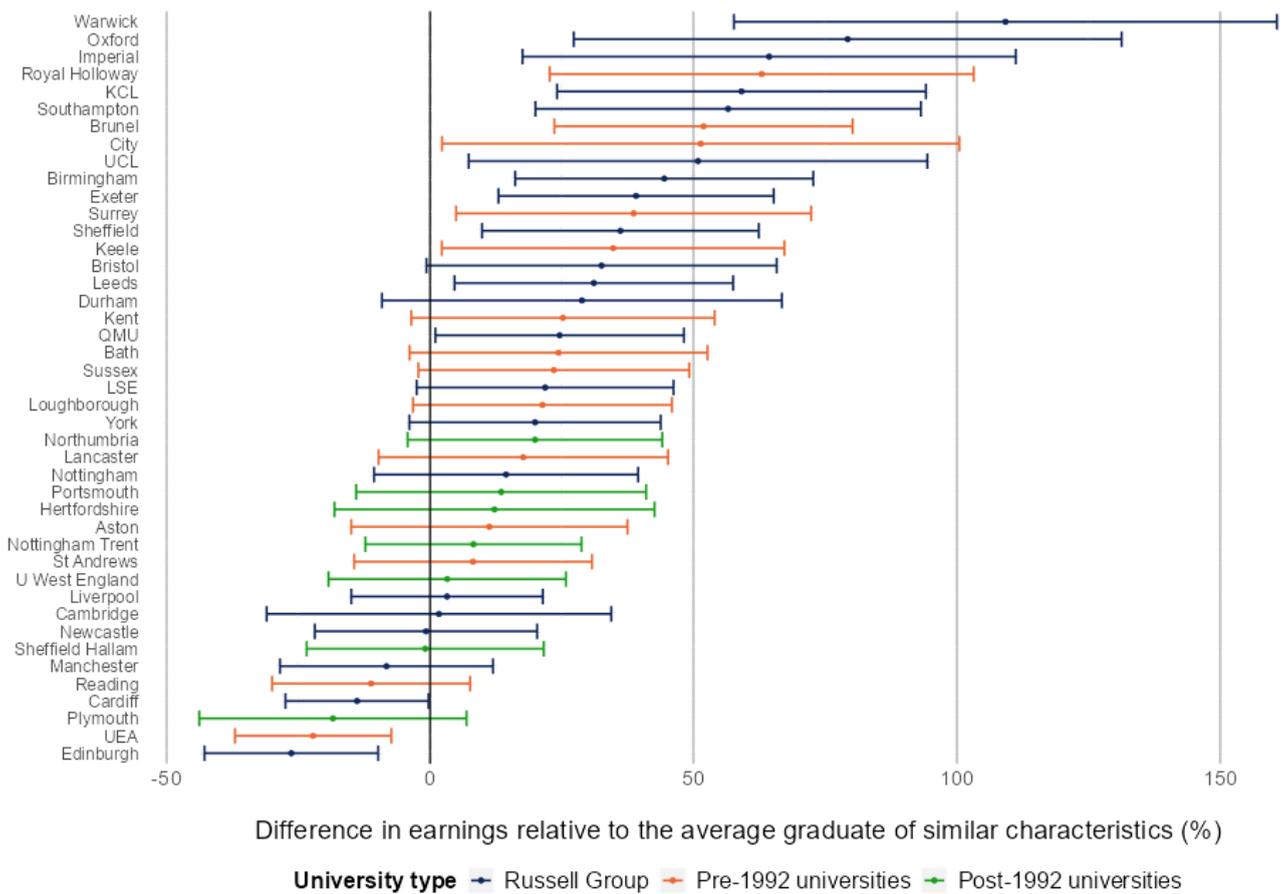
- Prior attainment – measured by GCSE and A-level points score: GCSE and A-level measures are raw point scores, including all GCSEs and A-levels taken.
- Whether attended sixth form.
- A-level subject mix: They control for a set of indicators of whether students take an A-level in a given subject (maths, sciences, social science, arts, humanities, languages, other) and an indicator for whether they have taken a vocational qualification at age 18. They do not control for the subject of the vocational qualification.
- School type (independent or state school): They include a separate dummy variable for independent schools, but they cannot separately control for ethnicity and SES for individuals in independent schools.
- Socio-economic background.
- Ethnicity.
- Region of applicant.
- Cohort of graduation.
- Age started university.

⁹⁹ Chris Belfield and others, [‘The impact of undergraduate degrees on early-career earnings’](#), 2018. Published on GOV.UK.

Estimated value-add charts for other subjects

Figure 37: Estimated value-add in earnings at age 29 by university for men who studied maths.

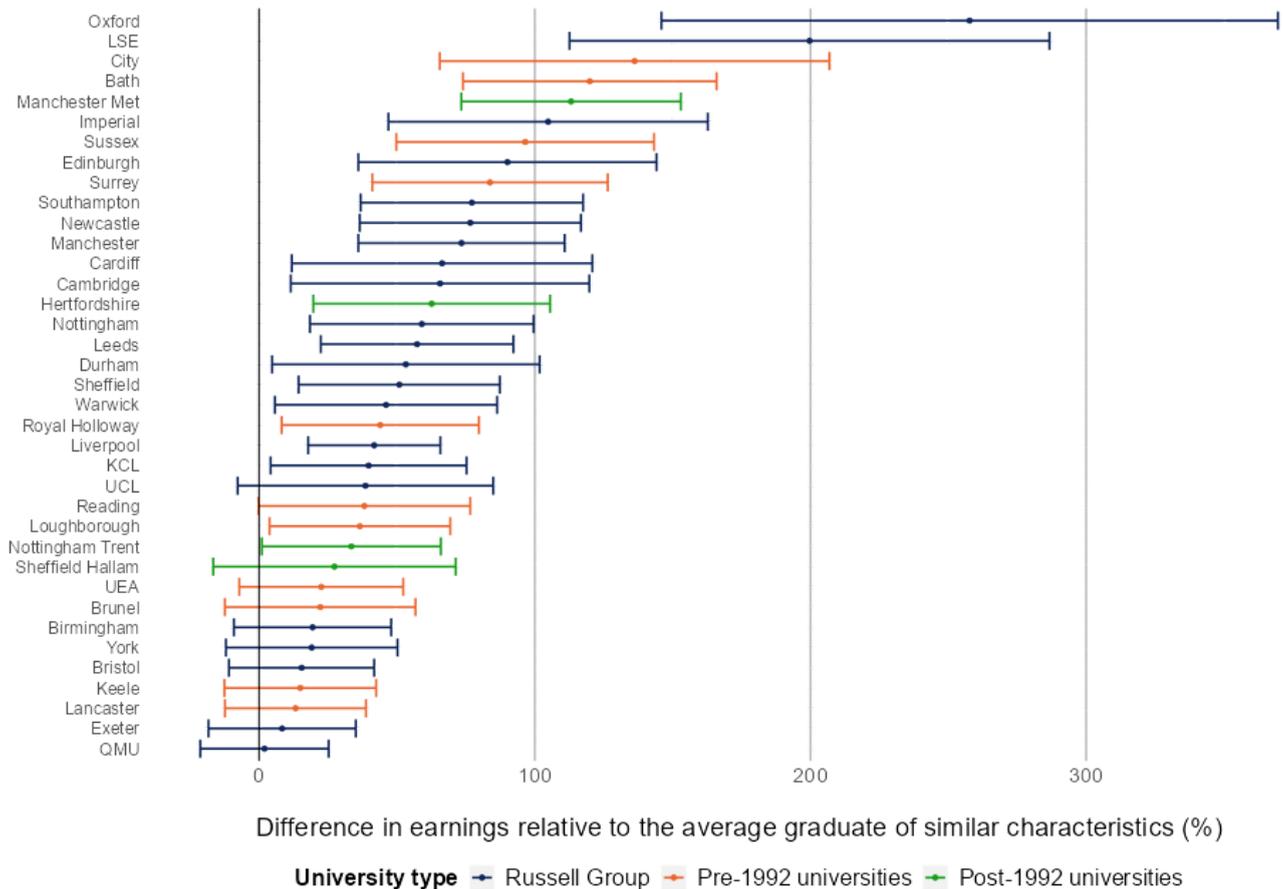
The estimated average earnings difference (in %) relative to a graduate of any subject but with similar background characteristics.



Source: Belfield and others (IFS), 'The impact of undergraduate degrees on early-career earnings', 2018b data. Chart produced by SMC.

Figure 38: Estimated value-add in earnings at age 29 by university for women who studied maths.

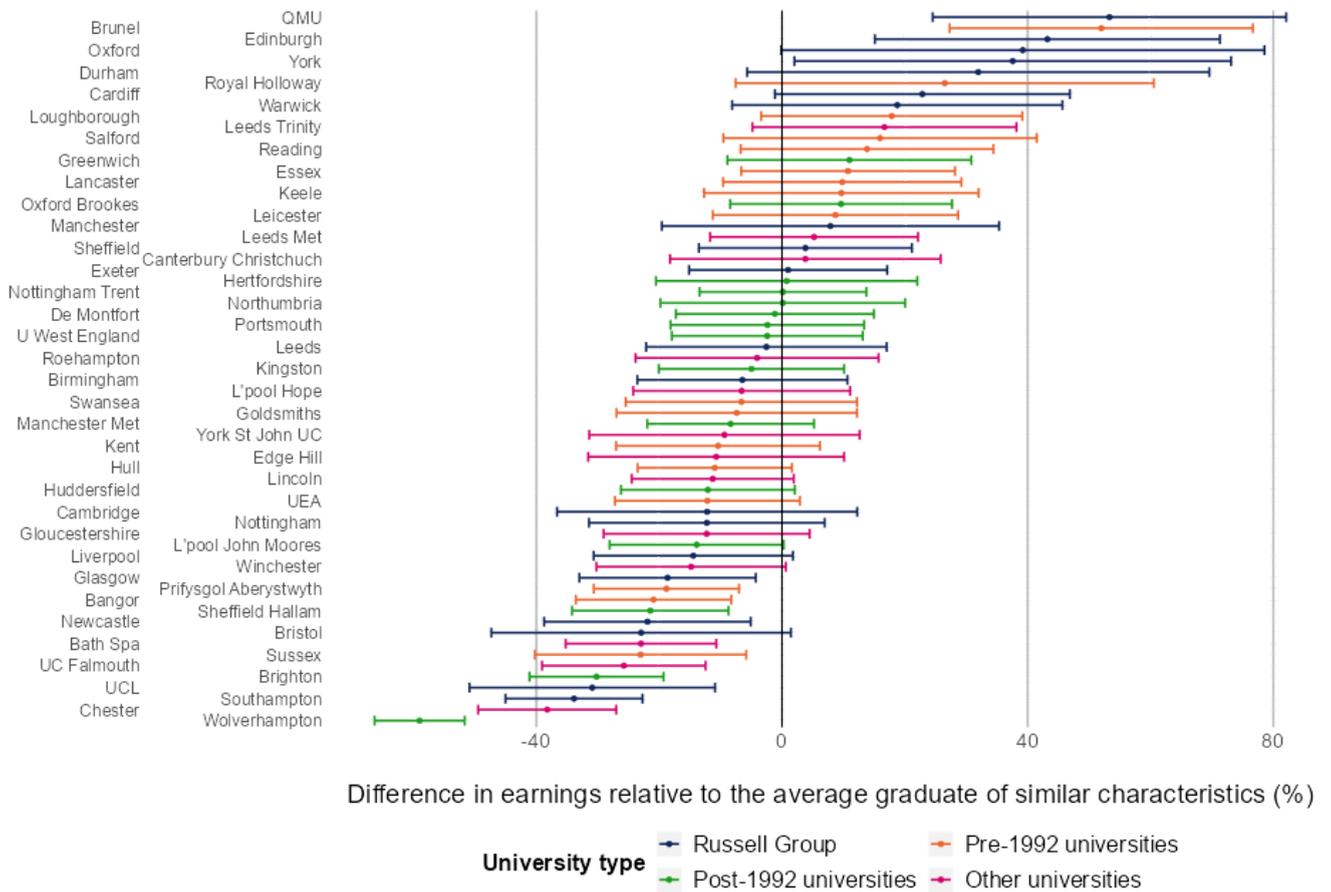
The estimated average earnings difference (in %) relative to a graduate of any subject but with similar background characteristics.



Source: Belfield and others (IFS), 'The impact of undergraduate degrees on early-career earnings', 2018b data. Chart produced by SMC.

Figure 39: Estimated value-add in earnings at age 29 by university for men who studied English.

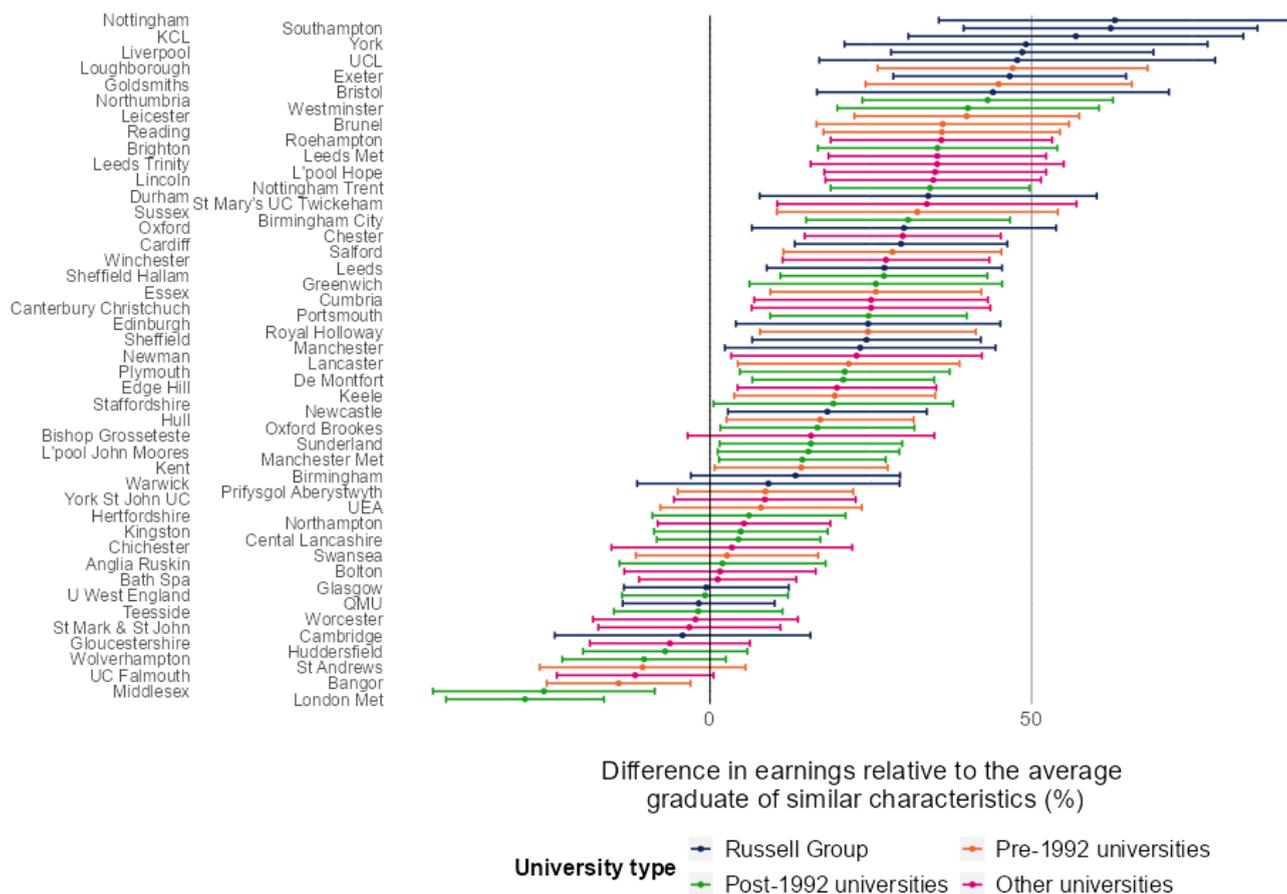
The estimated average earnings difference (in %) relative to a graduate of any subject but with similar background characteristics.



Source: Belfield and others (IFS), 'The impact of undergraduate degrees on early-career earnings', 2018b data. Chart produced by SMC.

Figure 40: Estimated value-add in earnings at age 29 by university for women who studied English.

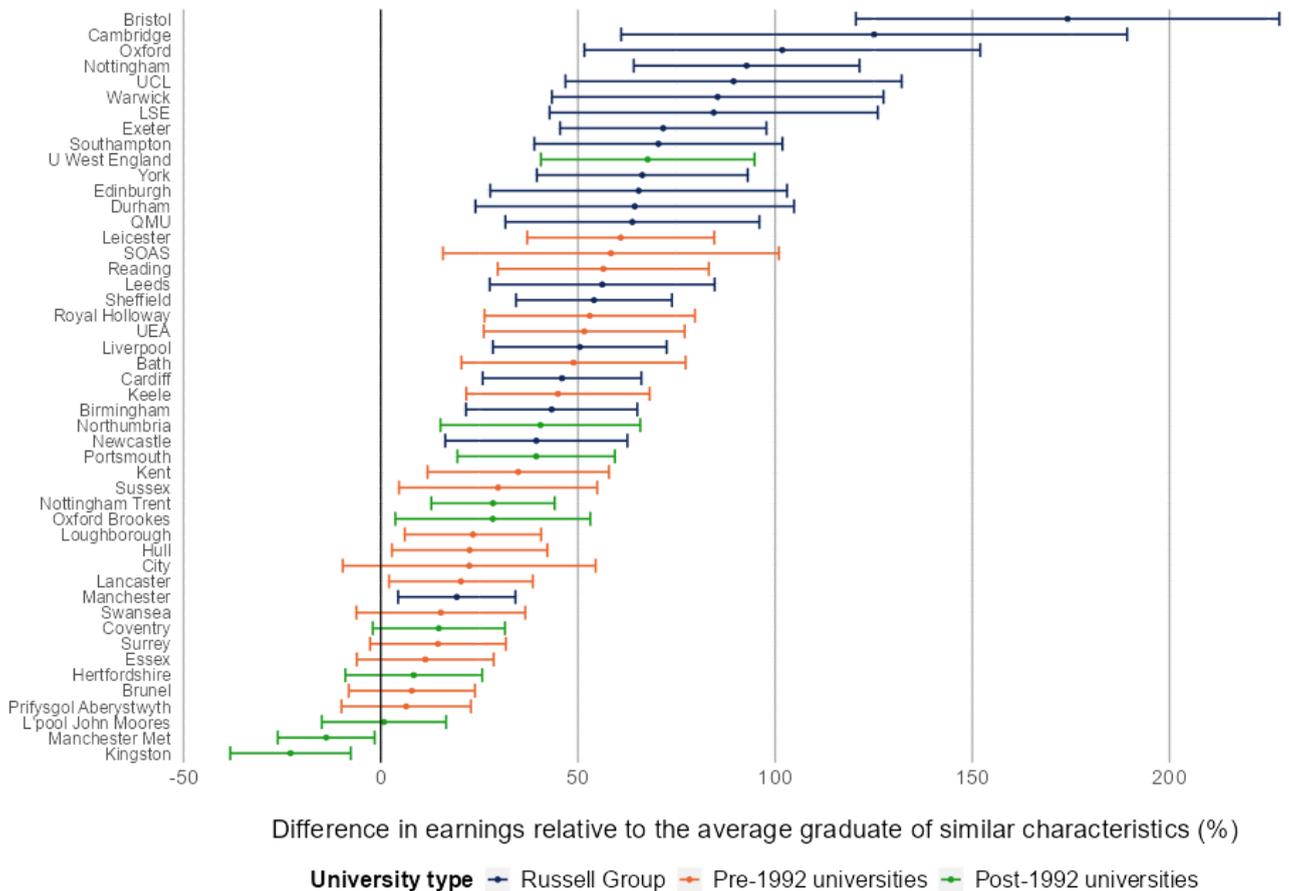
The estimated average earnings difference (in %) relative to a graduate of any subject but with similar background characteristics.



Source: Belfield and others (IFS), 'The impact of undergraduate degrees on early-career earnings', 2018b data. Chart produced by SMC.

Figure 41: Estimated value-add in earnings at age 29 by university for men who studied economics.

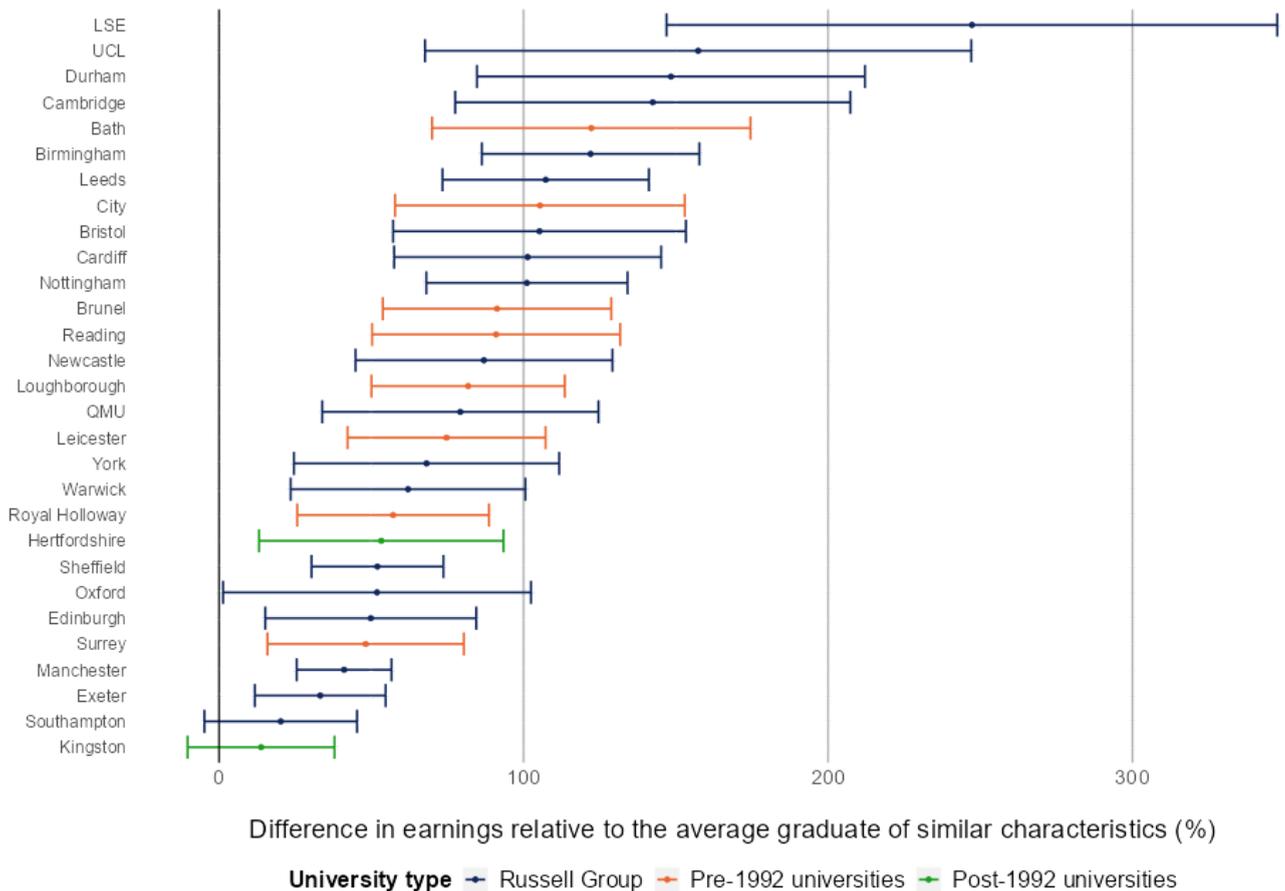
The estimated average earnings difference (in %) relative to a graduate of any subject but with similar background characteristics.



Source: Belfield and others (IFS), 'The impact of undergraduate degrees on early-career earnings', 2018b data. Chart produced by SMC.

Figure 42: Estimated value-add in earnings at age 29 by university for women who studied economics.

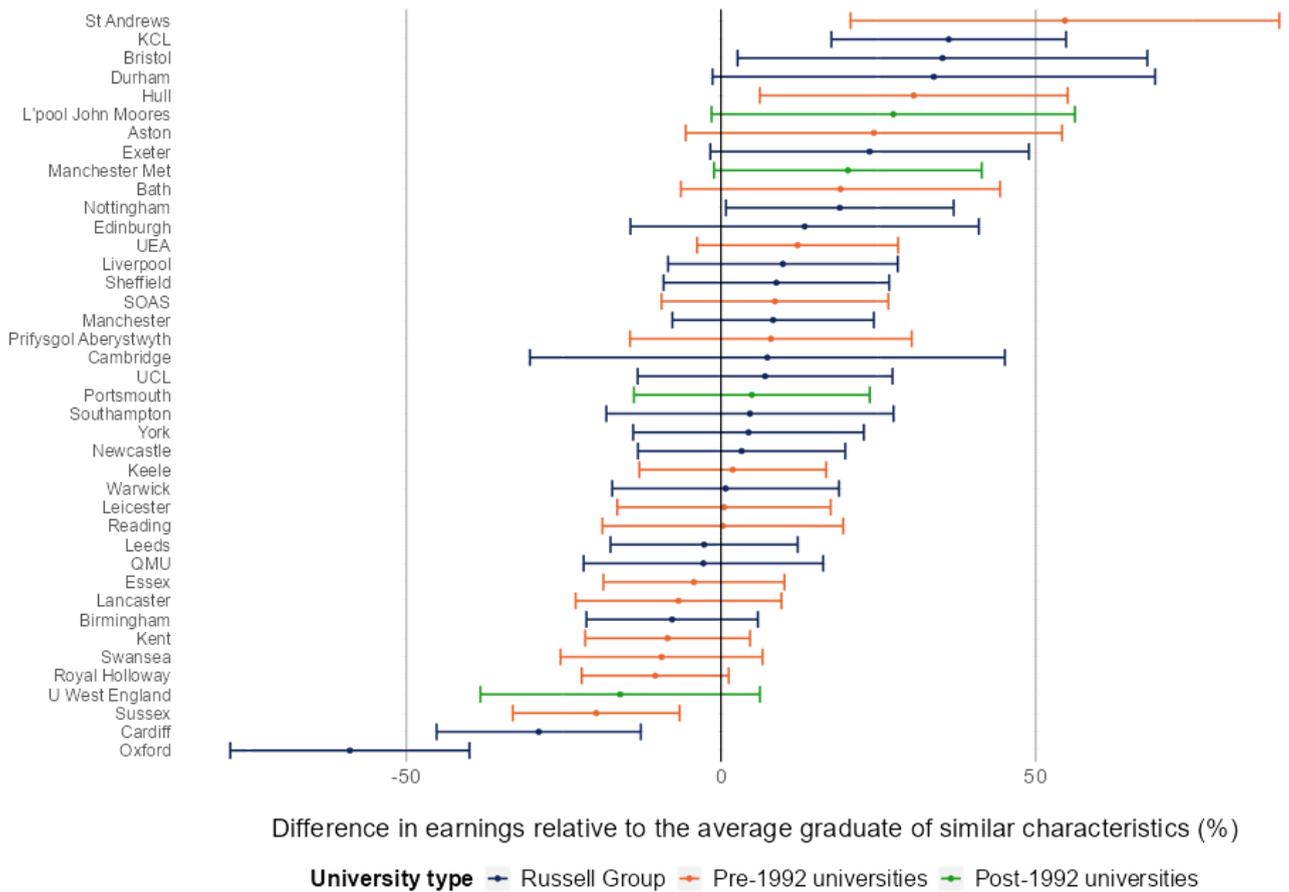
The estimated average earnings difference (in %) relative to a graduate of any subject but with similar background characteristics.



Source: Belfield and others (IFS), 'The impact of undergraduate degrees on early-career earnings', 2018b data. Chart produced by SMC.

Figure 43: Estimated value-add in earnings at age 29 by university for men who studied languages.

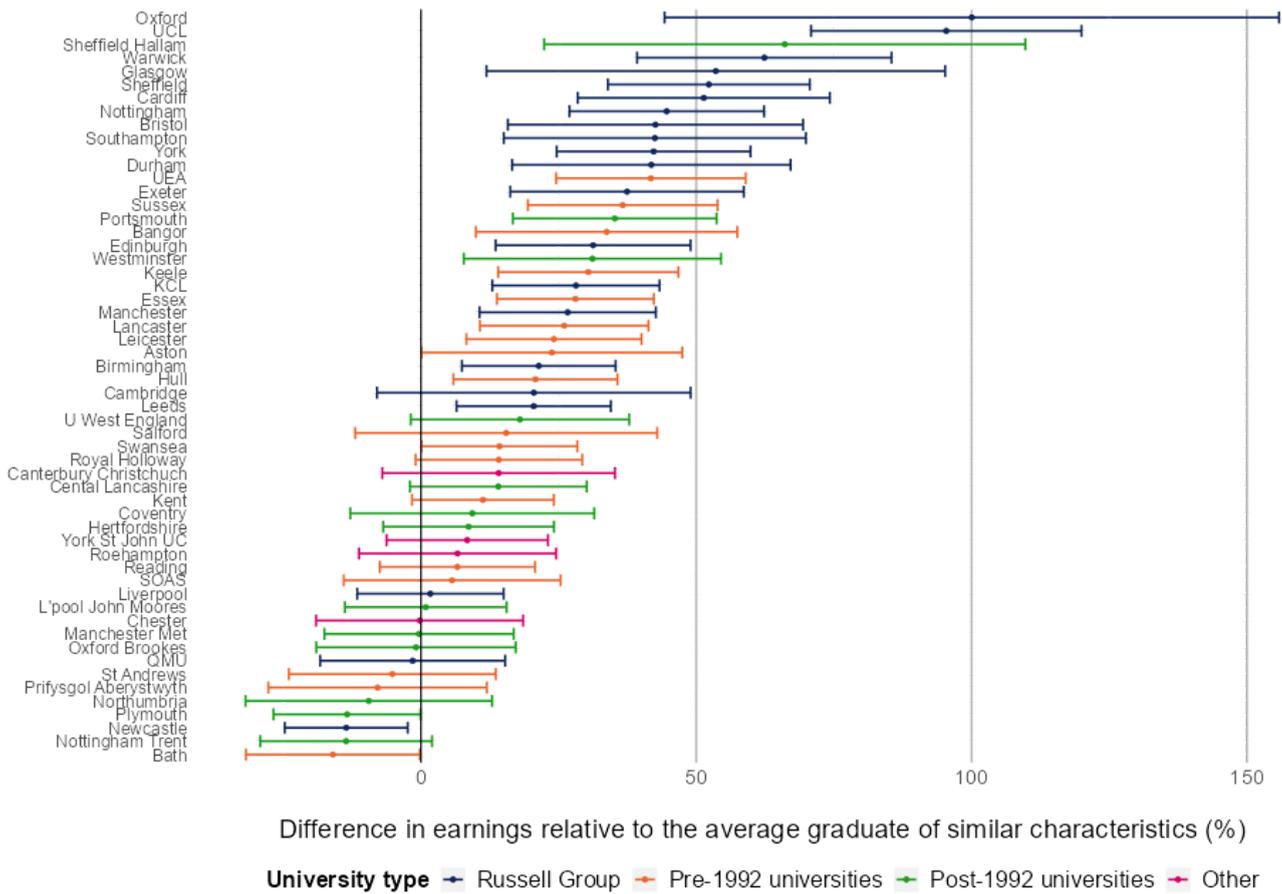
The estimated average earnings difference (in %) relative to a graduate of any subject but with similar background characteristics.



Source: Belfield and others (IFS), 'The impact of undergraduate degrees on early-career earnings', 2018b data. Chart produced by SMC.

Figure 44: Estimated value-add in earnings at age 29 by university for women who studied languages.

The estimated average earnings difference (in %) relative to a graduate of any subject but with similar background characteristics.



Source: Belfield and others (IFS), 'The impact of undergraduate degrees on early-career earnings', 2018b data. Chart produced by SMC.

Glossary

| | |
|------------------------|---|
| CRED | Commission on Race and Ethnic Disparities |
| FE | Further Education. In this review, these cover all other qualifications which do not lead to a degree. Note, there may be differences in how FE is defined in other literature. |
| HE | Higher Education. In this review, these are qualifications which typically lead to a degree. Note, there may be differences in how HE is defined in other literature. |
| HEI | Higher Education Institution. An institution which provides higher education qualifications. |
| HESA | Higher Education Statistics Agency |
| IDACI | IDACI Income Deprivation Affecting Children Index. This measures the proportion of all children aged 0 to 15 living in income deprived families. |
| IFS | Institute for Fiscal Studies |
| KS | Key stage |
| POLAR4 | A measure of participation in higher education among young people by local areas. This allows the identification of low participation neighbourhoods. |
| Post-1992 universities | Former polytechnic colleges which received university status in 1992 or an institution which has been granted university status since 1992. |

| | |
|-----------------------|---|
| Pre-1992 universities | Universities which are not in the Russell Group but which gained university status before 1992. |
| Russell Group | <p>A group of 24 research intensive universities.</p> <p>The list includes: University of Birmingham, University of Bristol, University of Cambridge, Cardiff University, Durham University, University of Edinburgh, University of Exeter, University of Glasgow, Imperial College London, King's College London, University of Leeds, University of Liverpool, London School of Economics & Political Science, University of Manchester, Newcastle University, University of Nottingham, University of Oxford, Queen Mary, University of London, Queen's University Belfast, University of Sheffield, University of Southampton, University College London, University of Warwick and University of York.</p> |
| SEB | Socio-economic background |
| SMC | Social Mobility Commission |
| Value-add | The return in earnings which are associated with studying for a qualification but take into account the individual and background characteristics of an individual. This helps to isolate the impact of studying a qualification on someone's earnings. |