

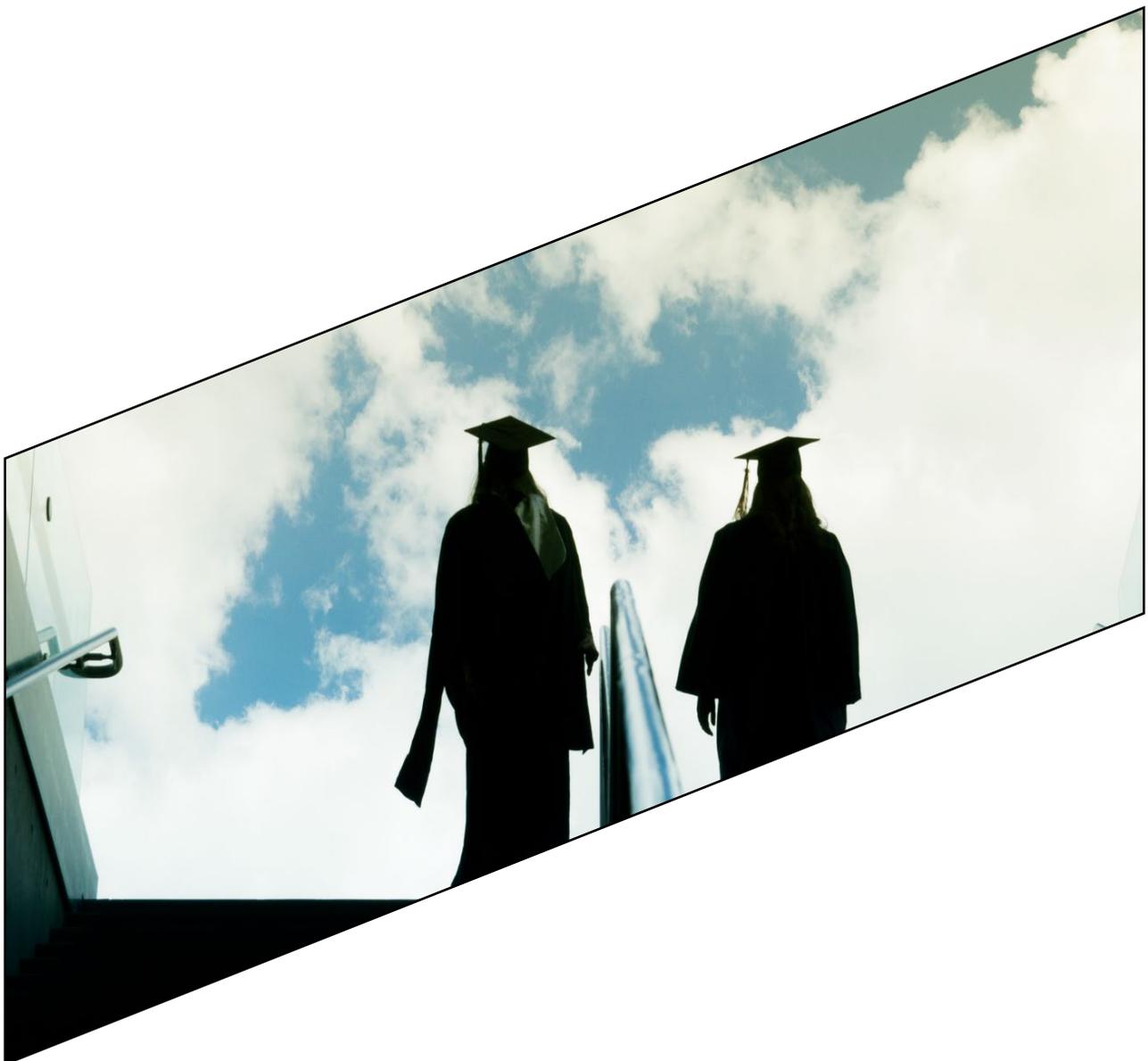


The Long Shadow

How childhood disadvantage depresses the earnings of university graduates in England

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Summary

Social mobility in the UK is limited: children are more likely to be poor as adults if they grow up in poverty. While education – and university in particular – is often seen as a route out of poverty, access remains unequal. Only 16 per cent of children who were in deep poverty at age 16 – proxied by eligibility of free school meals (FSM) – go on to graduate, compared to 32 per cent of their more advantaged peers.

This briefing note shows that even among those who do make it to graduation, childhood poverty casts a long shadow over earnings. We track the educational records and tax returns of every university graduate in England born since 1985 using the Longitudinal Education Outcomes (LEO) dataset. Going to university substantially boosts earnings, but a decade after graduation, those who grew up in deep poverty earn around 13 per cent less than graduates who did not. This is a substantial earnings gap – larger than headline gender and some ethnicity gaps – among a group who have already beaten considerable odds to reach university. And this gap is not confined to particular demographic groups: it is present for both men and women, and for White graduates and those from Black, Asian and Minority Ethnic (BAME) alike.

Part of the gap is driven by differences in educational pathways. Graduates who were in deep poverty at age 16 are less likely to access the most selective universities and to achieve the highest degree classifications – both of which are strongly associated with higher earnings. Accounting for these differences reduces the earnings gap by around half, from 13 to 7 per cent, indicating the importance of access to and performance within higher education for earnings, and how poverty reduces this access.

Accounting for the regions that graduates live and work in, and the firms they work for, narrows the gap a little further, but a gap of 5 per cent persists even then. In other words, when comparing two workers with the same degree subject and classification, from the same university, working for the same employer, ten years after graduation, the one who grew up in deep poverty will earn, on average, over £2,800 less per year.

The earnings gap is comprised of three components – differences in educational attainment, differences in jobs and a residual gap among graduates in the same job with the same university degree. How these components evolve over the first decade of careers is telling.

The total earnings gap starts at 15 per cent shortly after graduation and narrows to 13 per cent after 10 years. Around 3 percentage points of the initial gap reflects graduates from disadvantaged backgrounds working for lower-paying employers, but this effect

declines to 1 percentage point over the first 10 years of work as they move to more similar employers over the first decade of their careers – moving faster up the job ladder than their peers. The residual pay gap – for workers with the same degree, in the same job – remains at a stubborn 5 per cent throughout. We might think that this would shrink as professional experience comes to offset initial circumstances, but this is not the case.

Overall, our findings of large and enduring pay gaps provide another reason to tackle child poverty and the long shadow that it casts over the worlds of school and work.

Education is a key driver of social (im)mobility

Who your parents were and the circumstances in which you grew up shape your prospects as an adult. But relative to other wealthy countries, the UK has long had particularly low intergenerational mobility.¹ Children raised in disadvantaged families are far more likely than other children to end up lower down the earnings distribution themselves. A large literature has documented the breadth and persistence of this pattern (see Box 1).

One important channel through which early life poverty is transmitted is education. Children from disadvantaged backgrounds perform less well in school, are less likely to attend university, and when they do attend, are more likely to drop out before completing their degree.² Only 16 per cent of children who were in deep poverty at age 16 go on to obtain a university degree, compared to 32 per cent of their more affluent peers – a gap of 16 percentage points. This gap matters because graduates are both more likely to be in work and to earn more when they are. At age 31, graduates earn almost 50 per cent more than non-graduates, equivalent to £18,700 in annual earnings.³ The implications of this premium to the benefit of attending university are especially substantial given existing evidence that graduates from disadvantaged backgrounds face some of the highest returns to attending university and therefore have the most to gain from doing so.⁴

But an important question remains: what happens to those who do make it through university? Does the long shadow of being in deep childhood poverty persist even among those who have, on paper, done everything right?

BOX 1: What we already know about socioeconomic disadvantage and career outcomes in the UK

A large literature shows that children's life chances in the UK depend heavily on the social and economic circumstances of the families they are born into. The existing literature

shows that for people born between 1986 and 1989, adult earnings (at age 28) are about 40 per cent lower for men who were eligible for free school meals as children compared to those

¹ M Corak, *Inequality from Generation to Generation: The United States in Comparison*, Institute for the Study of Labor (IZA), May 2016; J Jerrim & L Macmillan, *Income Inequality, Intergenerational Mobility, and the Great Gatsby Curve: Is Education the Key?*, *Social Forces* 94(2), December 2015, <https://doi.org/10.1093/sf/sov075>.

² Education Policy Institute, *Annual Report 2025*, March 2026; C Crawford, *Socio-economic differences in university outcomes in the UK: drop-out, degree completion and degree class*, Institute for Fiscal Studies, October 2014.

³ RF analysis of DfE, *Longitudinal Education Outcomes*.

⁴ J Britton, L Dearden & B Waltmann, *The returns to undergraduate degrees by socio-economic group and ethnicity*, Institute for Fiscal Studies, March 2021.

who were not. For women, this gap is even larger, with earnings 60 per cent lower for those who were eligible for free school meals.⁵ These differences extend beyond earnings: access to elite occupations also varies by social class background.⁶ More broadly, while intergenerational mobility in the UK is similar to that of the US, it is low relative to many other developed countries.⁷

Previous research finds that differences in educational attainment explain a large share of the link between parents' and children's incomes, but that there is evidence of socioeconomic gaps

in outcomes even for people with the same level of education.⁸ Studies of elite UK employers find a 'class ceiling' in promotion and professional opportunities.⁹ Similarly, the literature finds that graduates from more advantaged backgrounds are more likely to get access to top UK jobs, and that applicants from working-class backgrounds are substantially less likely to receive job offers than those from professional backgrounds.¹⁰ In both cases, these gaps cannot be explained by differences in educational background.

The use of administrative data enables analysis of social mobility controlling for more detailed educational and employment characteristics

This briefing note uses extremely detailed administrative data on the earnings, educational attainment, and childhood background of the entire population of university graduates who were born between 1986 and 1989 and who attended school in England. The Longitudinal Education Outcomes (LEO) dataset – which is linked to HMRC tax records and the Inter-Departmental Business Register (IDBR) – can be used to trace where graduates grew up, whether they were in deep poverty in childhood – proxied by eligibility to free school meals (FSM) at age 16 – where and what they studied at university and what grades they got, which firms they work for, and how much they earn. And

5 L van der Erve et al., Intergenerational mobility in the UK, *Oxford Open Economics* 3(1), October 2023, <https://doi.org/10.1093/ooec/odad064>.

6 S Friedman, D Laurison & A Miles, Breaking the 'Class' Ceiling? Social Mobility into Britain's Elite Occupations, *The Sociological Review* 63(2), May 2015, <https://doi.org/10.1111/1467-954X.12283>.

7 M Corak, *Inequality from Generation to Generation: The United States in Comparison*, Institute for the Study of Labor (IZA), May 2016; J Jerrim & L Macmillan, Income Inequality, Intergenerational Mobility, and the Great Gatsby Curve: Is Education the Key?, *Social Forces* 94(2), December 2015, <https://doi.org/10.1093/sf/sov075>.

8 L van der Erve et al., Intergenerational mobility in the UK, *Oxford Open Economics* 3(1), October 2023, <https://doi.org/10.1093/ooec/odad064>; P Carneiro et al, *The long shadow of deprivation: Differences in opportunities across England*, Social Mobility Commission, September 2020; J Blanden, P Gregg & L Macmillan, *Accounting for intergenerational income persistence: noncognitive skills, ability and education*, Institute for the Study of Labor (IZA), January 2007.

9 S Friedman & D Laurison, *The Class Ceiling: Why it Pays to be Privileged*, Policy Press, January 2020, <https://doi.org/10.1093/sf/soz170>; S Friedman, Climbing the Velvet Drainpipe: Class Background and Career Progression within the UK Civil Service, *Journal of Public Administration Research and Theory* 33(1), October 2022, <https://doi.org/10.1093/jopart/muac045>.

10 L Macmillan, C Tyler & A Vignoles, Who Gets the Top Jobs? The Role of Family Background and Networks in Recent Graduates' Access to High-status Professions, *Journal of Social Policy* 44(3), July 2015, <https://doi.org/10.1017/S0047279414000634>; C Dilnot, L Macmillan & C Tyler, *Inequalities in Access to Professional Occupations*, UCL Centre for Education Policy and Equalising Opportunities, March 2025.

because the data includes the universe of English graduates rather than a sample, it is possible to control for all these factors simultaneously.

Our analysis begins by documenting the unadjusted earnings gap associated with having been in deep poverty at age 16 among graduates.¹¹ We then ask how much of this gap is explained by differences in educational attainment – specifically the university attended, subject studied, and degree classification achieved. Next, we compare graduates who not only have the same educational pathway but also end up working at the same firm. In this way, the comparison is progressively tightened so that any remaining earnings gap reflects differences among otherwise extremely similar graduates. Finally, we trace the evolution of these gaps over the first decade of graduates' working lives.

The combination of very large sample sizes and unusually rich information on educational and labour market trajectories in LEO makes it possible to estimate the impact of childhood disadvantage while controlling for detailed characteristics, as well as combinations of these characteristics. This goes beyond what is usually feasible with alternative data sources (see Box 2). This includes controlling for the interactions between universities, subject groups and degree classifications to evaluate the earnings gaps among graduates who studied the same subject at the same university and achieved the same result. This almost entirely removes any effect of differences in academic outcomes from the average earnings gap between graduates who were disadvantaged in childhood and those who were not. And we can even go a step further and examine the gap among workers employed by the same firm. This provides the clearest picture yet of how childhood disadvantage is reflected in graduate earnings in the UK. More information on the sample and methods used is in Annex 1.

BOX 2: The Longitudinal Education Outcomes dataset

The LEO dataset is the most comprehensive source of information on education and labour market outcomes for the UK. It brings together information from four administrative datasets:

- The National Pupil Database (NPD), which combines early years and

state school data, recording several characteristics, including FSM eligibility;

- Higher education records from the Higher Education Statistics Agency (HESA);
- University and Colleges Admissions Service (UCAS) data, covering a wide

¹¹ Unadjusted gaps refer to average differences in outcomes between two groups before accounting for any differences in characteristics that may drive these gaps.

range of university characteristics, including institution, attendance, subject, and degree classification; and,

- Earnings and employment information from HMRC and DWP records, linked with business information from the IDBR.

The LEO dataset covers all individuals born from 1985 onwards who attended state schools in England.¹² It contains annual information on the education, earnings and employment pathways of these 38 million people from 1995 to 2021.¹³ The key advantage of the LEO over, for example, Understanding

Society is the comprehensive coverage of the population living in England, which – along with a rich set of characteristics – allows for detailed and granular analyses with high statistical power. Despite these advantages, it also has some drawbacks relative to alternative datasets. Unlike, for example, the Annual Survey of Hours and Earnings (ASHE), it does not contain information on hours worked, excludes people who have migrated to the UK but have not been educated here, and captures individuals who attended school in England only. Any analysis should be interpreted in the context of these limitations.

Living in ‘deep poverty’ in childhood casts a long shadow of disadvantage later in life

Deep poverty can be proxied by eligibility for free school meals

Eligibility for FSM at age 16 is commonly used in UK research as an indicator of deep childhood disadvantage, deprivation or low family income.¹⁴ FSM eligibility is primarily tied to receipt of income-related benefits, but the criteria have expanded over time, meaning its role as a proxy for poverty has changed.

In our dataset, the first cohort is observed at age 16 in the 2001/02 academic year, when FSM eligibility was limited to families receiving Income Support or Income Based-Job Seeker’s Allowance.¹⁵ By 2004/05, eligibility was extended to include those in receipt of

¹² While the LEO observes people born from 1985 onwards, our measure of deep poverty – eligibility to FSM at age 16 – is only captured for those born from 1986 onwards.

¹³ Administrative Data Research (ADR) UK, *Longitudinal Education Outcomes – England*, March 2026.

¹⁴ S Ilie, A Sutherland & A Vignoles, Revisiting free school meal eligibility as a proxy for pupil socio-economic deprivation, *British Educational Research Journal* 43(2), April 2017, <https://doi.org/10.1002/berj.3260>; P Carneiro et al, *The long shadow of deprivation: Differences in opportunities across England*, Social Mobility Commission, September 2020; Office for National Statistics, *Why free school meal recipients earn less than their peers?*, August, 2022; J Britton, E Drayton & L van der Erve, *Which university degrees are best for intergenerational mobility?* Institute for Fiscal Studies, November 2021.

¹⁵ Administrative records likely understate the number of children eligible as children eligible for FSM, may not have made a claim. Related to this, across time, fewer children receive free meals than are estimated to be in poverty. See: G Hobbs & A Vignoles, *Is children’s free school meal ‘eligibility’ a good proxy for family income?*, *British Educational Research Journal* 36(4), August 2010, <https://doi.org/10.1080/01411920903083111>; T Campbell, K Cooper & A Joseph, *Registration for Free School Meals (FSM): issues and implications for research, policymaking, practice and access*, Education Policy Institute, October 2025.

Child Tax Credit.¹⁶ And currently, a significantly wider range of benefits and tax credits qualify, with further expansion planned.¹⁷ As a result, FSM eligibility was a closer proxy for deep poverty for older cohorts – including those studied in this report – than it is for younger cohorts.

Among those born between 1986 and 1989, 13 per cent (just over 226,000 people) were eligible for FSM at age 16. Among graduates, a much lower proportion was eligible – 7 percent (just over 35,000 graduates).

Graduates who were in deep poverty as children earn substantially less as adults than those who were not

As discussed above, graduates typically earn more at work than non-graduates but disadvantaged children are less likely to become graduates compared to their more affluent peers. Yet even among those who do clear this hurdle, a large pay gap persists. As Figure 1 shows, 10 years after graduation, employed graduates who were in deep poverty at age 16 earn 13 per cent less than graduates who were not. This is a substantial gap – equivalent to over £7,590 a year, and larger than the gender pay gap and many of the ethnicity pay gaps in the UK.¹⁸

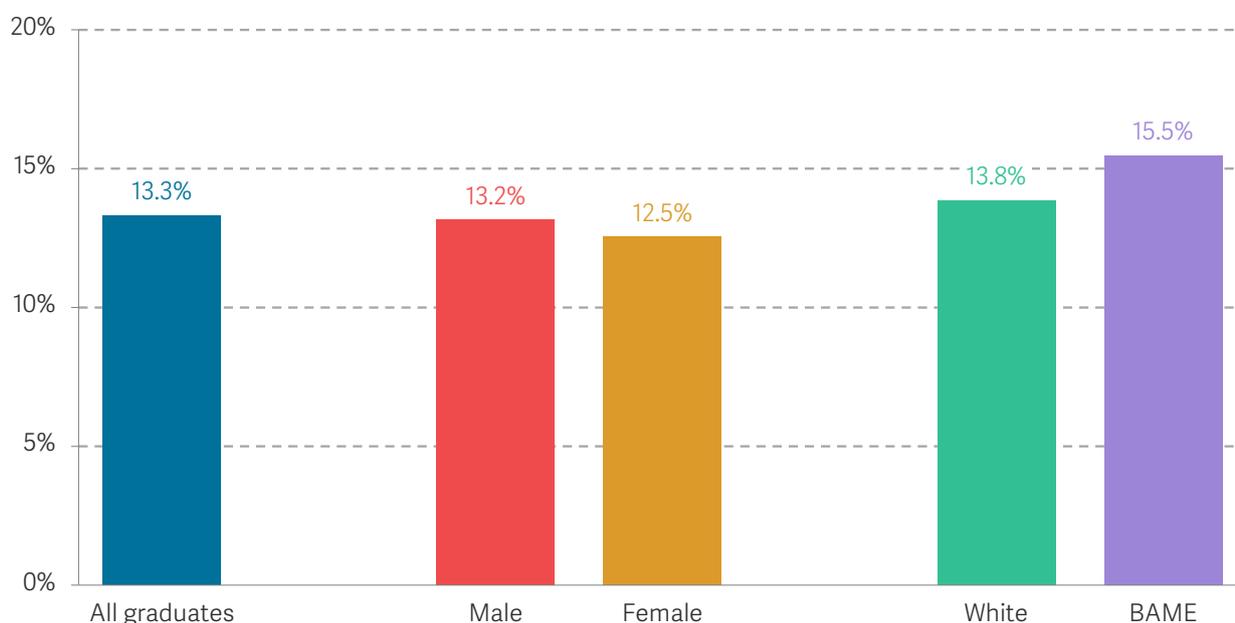
¹⁶ G Hobbs & A Vignoles, Is children's free school meal 'eligibility' a good proxy for family income?, *British Educational Research Journal* 36(4), August 2010, <https://doi.org/10.1080/01411920903083111>; T Campbell, K Cooper & A Joseph, [Registration for Free School Meals \(FSM\): issues and implications for research, policymaking, practice and access](#), Education Policy Institute, October 2025.

¹⁷ Department for Education, [Expanding free school meals: what parents need to know](#), June 2025.

¹⁸ Office for National Statistics, [Gender pay gap in the UK: 2025](#), October 2025; Office for National Statistics, [Ethnicity pay gaps, UK: 2012 to 2022](#), November 2023.

FIGURE 1: Graduates who grew up in deep poverty face a large pay gap 10 years into their careers

Unadjusted earnings gap 10 years after graduation, associated with having been in deep poverty at age 16, for all graduates and by demographic group: England



NOTES: Earnings gap associated with having been in deep poverty in childhood is for graduates born between 1986 and 1989 and who attended school in England.
SOURCE: RF analysis of DfE, Longitudinal Education Outcomes.

The deep poverty pay gap exists for both men and women, and for White and BAME graduates (Figure 1), although the magnitude varies somewhat across groups – for example, it is larger among BAME graduates. The persistence of the deep poverty pay gap across these broad ethnic groups suggests it captures something distinct from, though potentially interacting with, the well-documented disparities in labour market outcomes and ethnicity pay gaps.¹⁹

The stability of the gap across demographic subgroups strengthens the case that childhood socioeconomic background is playing an important role. The mechanisms that link disadvantage to lower pay appear to operate broadly across the graduate population, rather than being confined to a specific demographic group.

¹⁹ For differences in labour market outcomes across ethnic groups, see: ONS, [Ethnicity pay gaps, UK: 2012 to 2022](#), November 2023; M Hudson, P Ahonen & J Bajaj, [Ethnicity, poverty, and in-work inequalities in the UK](#), February 2026.

Graduates who were disadvantaged attend less selective universities and get lower degree marks – but this only explains half of the pay gap

The literature discussed in Box 1 highlights the central role of education in shaping the UK's relatively low levels of intergenerational mobility. The pathways individuals follow through the education system are known to affect earnings but are also correlated with being disadvantaged in childhood. Disadvantaged students are less likely than their more advantaged peers to achieve good grades at school and to progress to selective universities and high-paying fields of study.²⁰ As a result, part of the graduate pay gap associated with deep poverty reflects differences in educational outcomes for disadvantaged students, inequalities rooted before labour market entry.

The left panel of Figure 2 shows that graduates who were in deep poverty at age 16 are markedly less likely to attend high-selectivity universities (i.e. those with the most competitive entry requirements). Only 15 per cent attend such universities, compared to almost one-third of their more affluent peers.²¹ A similar gap is present in degree outcomes. The right panel of Figure 2 shows that graduates from disadvantaged backgrounds are less likely to achieve a First-class or Upper Second class honours, with 36 per cent doing so compared to 44 per cent among those from more advantaged backgrounds.²²

In contrast, differences by subject area are less pronounced. For example, 25 per cent of graduates from disadvantaged backgrounds studied STEM (science, technology, engineering and mathematics) subjects, compared to 28 per cent of their more advantaged counterparts. Even in medicine – a highly-prestigious subject – participation rates are similar, with around 2 per cent of graduates from both backgrounds studying it.²³

²⁰ Education Policy Institute, *Annual Report 2025*, March 2026; S McGrath & L Rogers, Do less-advantaged students avoid prestigious universities? An applicant-centred approach to understanding UCAS decision-making, *British Educational Research Journal* 47(4), March 2021, <https://doi.org/10.1002/berj.3710>; J Britton, E Drayton & L van der Erve, *Which university degrees are best for intergenerational mobility?* Institute for Fiscal Studies, November 2021.

²¹ Existing research finds that disadvantaged students 'undermatch' or are more likely to apply to lower-quality degrees across the achievement distribution. The predicted grades – the grades with which students make degree choices with – of high-achieving disadvantaged students are also more likely to be under-predicted, while overall, grades are largely over-predicted. See: S Campbell et al., Matching in the Dark? Inequalities in student to degree match, *Journal of Labor Economics* 40(4), October 2022, <https://doi.org/10.1086/718433>; G Wyness, *Rules of the game: Disadvantaged students and the university admissions process*, Sutton Trust, December 2017.

²² Although these are important gaps in degree classification across all graduates, existing research shows that, conditional on prior school attainment, differences in degree classification are much narrower between disadvantaged graduates and their better-off peers. This, nonetheless, underscores the importance of early life inequalities. See: C Crawford, *Socio-economic differences in university outcomes in the UK: drop-out, degree completion and degree class*, Institute for Fiscal Studies, October 2014.

²³ RF analysis of DfE, Longitudinal Education Outcomes.

FIGURE 2: Graduates who were in deep poverty are less likely to attend the most selective universities, and more likely to receive lower degree marks than their more advantaged peers

Proportion of graduates attending high, medium and low selectivity universities (left panel), and receiving different degree classifications (right panel), by whether they were in deep poverty at age 16: England



NOTES: University selectivity is calculated by the Higher Education Statistics Agency (HESA). It classifies universities into the three categories according to the average UCAS points of incoming undergraduate students.

SOURCE: RF analysis of DfE, Longitudinal Education Outcomes.

These patterns are not surprising. Children in deep poverty get lower grades in school on average, particularly during the key stages between ages 16 to 19 years when pathways into further and higher education are determined.²⁴ As a result, they are less likely to gain admission to more selective institutions, as shown in Figure 2.

Differences may also reflect inequalities in access to resources, support and information about the institutions and subjects that offer the strongest earnings returns. Gaps in attainment persist once at university: existing research shows that differences in degree outcomes are closely related to prior school performance, even among students studying the same course.²⁵ Financial pressures and weaker support networks may further affect disadvantaged students' ability to succeed, and evidence suggests that targeted interventions here can improve students' participation and performance.²⁶

²⁴ Education Policy Institute, *Annual Report 2025*, March 2026.

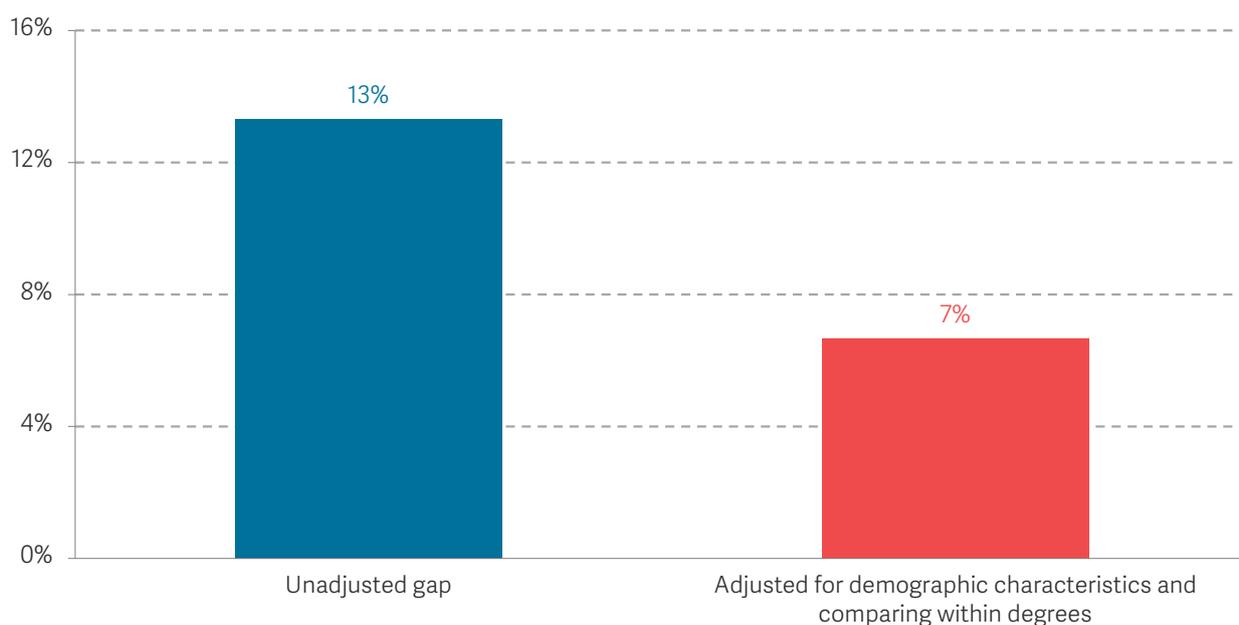
²⁵ C Crawford, *Socio-economic differences in university outcomes in the UK: drop-out, degree completion and degree class*, Institute for Fiscal Studies, October 2014.

²⁶ J Denning, B Marx & L Turner, *ProPelled: The Effects of Grants on Graduation, Earnings, and Welfare*, National Bureau of Economic Research, June 2018; C Farquharson and E Greaves, *An evaluation of the impact of the Social Mobility Foundation programmes on education and employment outcomes*, Institute for Fiscal Studies, May 2021.

Given the importance of these factors, the unadjusted pay gap shown in Figure 1 can be adjusted to account for differences in university attended, subject studied and degree classification achieved, alongside demographic characteristics including sex and ethnicity. This allows for comparison between graduates with very similar educational profiles – those who studied the same subject, achieved the same degree classification and attended the same university. This reduces the deep poverty earnings gap, 10 years after graduation, by almost half (see Figure 3). In other words, a substantial part of the lower earnings of disadvantaged graduates reflects their concentration in less selective universities and lower degree classifications, both of which are credentials well-rewarded in the labour market.²⁷ But the remaining pay gap – of 7 per cent, equivalent to £3,800 in earnings per year – reflects differences between otherwise very similar graduates.

FIGURE 3: Education explains about half the earnings gap between graduates who were in deep poverty in childhood and those who were not, but a penalty persists even among very similar graduates

Earnings gap 10 years after graduation, associated with having been in deep poverty at age 16, adjusted for demographic and university characteristics: England



NOTES: Earnings gap associated with having been in deep poverty in childhood is for graduates born between 1986 and 1989 who attended school in England, adjusted for demographic characteristics (sex and ethnicity groups) and main and interaction effects of university characteristics (institution, degree classification and subject group).

SOURCE: RF analysis of DfE, Longitudinal Education Outcomes.

²⁷ J Britton et al., [How much does it pay to get good grades at university?](#) Institute for Fiscal Studies, April 2022; J Britton, E Drayton & L van der Erve, [Which university degrees are best for intergenerational mobility?](#) Institute for Fiscal Studies, November 2021.

While differences in university pathways and performance ‘explain’ almost half of the earnings gap experienced by disadvantaged graduates, that is not to say this portion of the gap is any less consequential. Rather it shows that if graduates from disadvantaged backgrounds had the same university pathways as their peers from more affluent backgrounds, the earnings gap 10 years later would be substantially smaller – indicating these pathways play a major role in propagating childhood disadvantage into adult life.

A stubborn and large pay gap remains even for workers with the same education, in the same region and the same firm

So far, we’ve seen that graduates who were in deep poverty in childhood face a 13 per cent earnings gap after 10 years in work post graduation. Their educational pathways through university – the institution and subject they attended and the classification they ended up with – explain about half of this gap. But even when comparing graduates with the same degree, those who were disadvantaged in childhood still earn around 7 per cent less than their peers. This suggests that factors beyond educational credentials continue to link childhood disadvantage to lower earnings. The next step is to examine how much where they work can account for the remaining gap.

Graduates who were disadvantaged in childhood work in different regions and industries compared to their more affluent peers

Figure 4 shows the odds ratio – the relative likelihood of graduates from disadvantaged backgrounds – of being in certain industries and regions compared to graduates from more advantaged backgrounds. It shows that graduates who were disadvantaged are somewhat overrepresented in some low-paying labour markets and underrepresented in higher-paying ones such as the South East and East England. But they are also considerably more likely to work in high-paying London than their counterparts who were less disadvantaged. Turning from region to industry, they are somewhat more likely to work in industries considered ‘low paid’.

FIGURE 4: Disadvantaged graduates are more likely to work in lower paid industries and regions, except for London

Odds ratios of graduates who experienced deep poverty at 16 compared to those who did not, and average annualised earnings by low-paid and other industry sections (left panel) and regions (right panel): England



NOTES: Odds ratio corresponds to the odds of graduates who experienced deep poverty in childhood being in certain industries and regions relative to the odds for other graduates. Values above 1 indicate that disadvantaged graduates are relatively more represented. Low paid industries correspond to those with average annualised earnings below £25,000, being industry sections I (accommodation and food service activities), T (activities of households as employers), A (agriculture, forestry and fishing), R (arts, entertainment and recreation), and G (wholesale retail and trade).
 SOURCE: RF analysis of DfE, Longitudinal Education Outcomes.

Accounting for differences in the types of firms graduates from disadvantaged backgrounds work in narrows the pay gap only slightly

Beyond the regions and industries people work in, employers themselves play an important role in shaping earnings. Firms differ not only in the wages they offer, but also in progression opportunities and flexibility arrangements. Existing research shows that movements from lower-paying to higher-paying employers – also known as the ‘job ladder’ – are a key driver of earnings growth. As access to these higher-paying employers is uneven, this can also drive earnings gaps. Certain groups – such as women, or younger and less educated workers – may be more likely to become trapped in worse employers or get knocked off the job ladder altogether.²⁸

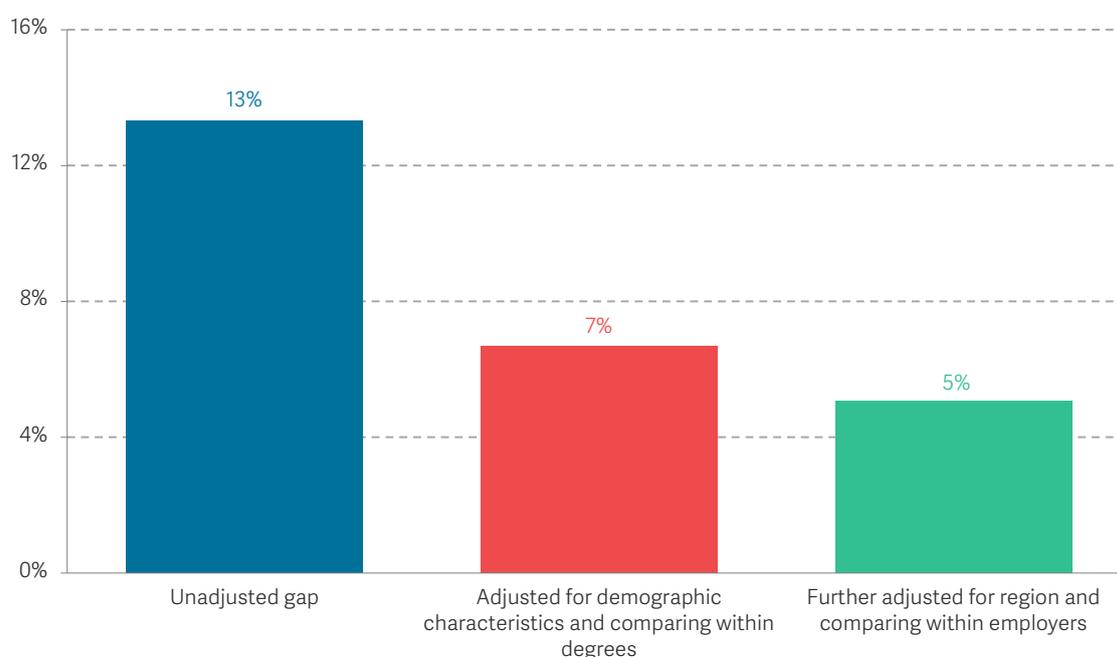
²⁸ J Haltiwanger, H Hyatt & E McEntarfer, *Who moves up the job ladder?* National Bureau of Economic Research, August 2017; E Barth, S Kerr & C Olivetti, *The dynamics of gender earnings differentials: Evidence from establishment data*, National Bureau of Economic Research, July 2019.

How childhood disadvantage depresses the earnings of university graduates in England

Adding controls for region and employer – effectively comparing graduates working at the same place – reduces the pay gap further, by 2 percentage points to 5 per cent. Figure 5 shows how the gap narrows as additional controls are introduced: from the unadjusted gap of around 13 per cent, to around 7 per cent after accounting for educational pathways, to around 5 per cent once differences in region and employer are taken into account. And so disadvantaged graduates are not only affected by earlier inequalities in access to educational pathways, but also – although to a smaller extent – by where they work after overcoming the hurdles of graduation.

FIGURE 5: Adjusting the pay gap for work characteristics and employer reduces the gap, but only modestly

Earnings gap 10 years after graduation, associated with having been in deep poverty at age 16, unadjusted, adjusted for demographic and university characteristics, and further adjusted for work characteristics: England



NOTES: Earnings gap associated with having been in deep poverty in childhood is for graduates born between 1986 and 1989 who attended school in England, adjusted for demographic characteristics (sex and ethnicity groups) and main and interaction effects of university characteristics (institution, classification and subject group); and for region of residence, firm size, industry section and firm fixed effects.

SOURCE: RF analysis of DfE, Longitudinal Education Outcomes.

This is a striking finding. Two graduates who attended the same university, studied the same subject, achieved the same grade, and now work at the same firm still earn different amounts depending on their childhood circumstances. So 10 years into their careers, those who experienced deep poverty in childhood earn around 5 per cent less than otherwise similar peers – equivalent to over £2,800 per year.

How childhood disadvantage depresses the earnings of university graduates in England

This result states that the remaining 5 per cent gap is not primarily explained by differences between employers, such as in wages and progression structures, or in the distributions of graduates from different backgrounds. Instead, it points to processes within employers, consistent with graduates from disadvantaged backgrounds experiencing, for example, differences in pay-setting and career progression to their more advantaged peers, even though they work in the same place and have similar educational credentials.

There are several possible explanations for why this ‘residual’ pay penalty arises. It may reflect factors that are not observed in the LEO data, such as the occupations people work in, or their patterns of work.²⁹ This would suggest that graduates who were less disadvantaged in childhood work in better-paid occupations, or longer hours. But it may also reflect less ‘measurable’ factors, such as differences in professional networks — the contacts and connections that help people learn about opportunities and secure promotions.³⁰ It may relate to what sociologists call “cultural capital” — the confidence, manners, and social ease that come from growing up in a professional household and that are valued, consciously or not, in the workplace.³¹ It may reflect differences in the ability to take career risks, given that graduates from disadvantaged backgrounds are less likely to have a family safety net to fall back on. Or it may reflect subtle patterns of employer decision-making.³² It is not possible to fully distinguish these channels with the data available — a limitation that motivates the continuation of this research.

The raw gap narrows slightly with experience, driven by workers who were disadvantaged in childhood moving up the job ladder

Having examined the earnings gap at the 10th year in work, we now turn to how it evolves over graduates’ early careers. As graduates accumulate experience, develop and demonstrate skills, and move between employers, the effect of their childhood circumstances might be expected to fade. And indeed Figure 6 does show a small decline in the pay gap, as the total earnings gap falls from 15 per cent on entering the labour market (year one) to 13 per cent by year 10.

²⁹ While the LEO is a comprehensive dataset, it does not provide information on occupation, hours of work, and sector — all well-established drivers of earnings in the UK. See: M Bryning & A Guveli, Understanding the ethnic pay gap in Britain, *Work, employment and society* 26(4), August 2012, <https://doi.org/10.1177/0950017012445095>; P Murphy et al., Understanding what has been happening to the public-sector pay premium in Great Britain: A distributional approach based on the labour force survey, *British Journal of Industrial Relations* 58(2), June 2020, <https://doi.org/10.1111/bjir.12474>; J Denning et al., The return to hours worked within and across occupations: Implications for the Gender Wage Gap, Institute for the Study of Labor (IZA), April 2021, <https://doi.org/10.1177/001979392110453>.

³⁰ A large strand of literature finds a strong correlation between social ties, networks and connections and chances of success in the labour market. Those with ‘elite’ or ‘strong’ familial connections are more likely to make successful transitions from education to the labour market and to continue to find opportunities later in life. See: F Kramarz & O Skans, When strong ties are strong — networks and youth labour market entry, Institute for Labour Market Policy Evaluation, November 2011, <https://doi.org/10.1093/restud/rdt049>; G Tholen et al., The role of networks and connections in educational elites’ labour market entrance, *Research in Social Stratification and Mobility* 34(1), December 2013, <https://doi.org/10.1016/j.rssm.2013.10.003>.

³¹ M Jaeger & K Karlson, Cultural Capital and Educational Inequality: A Counterfactual Analysis, *Sociological Science* 5(1), December 2018, <https://doi.org/10.15195/v5.a33>.

³² For how subtle patterns of employer decision-making may affect career progression of, for example, women, through unconscious biases, see: A Filut, A Kaatz & M Carnes, *The impact of unconscious bias on women’s career advancement*, The Sasakawa Peace Foundation Expert Reviews Series on Advancing Women’s Empowerment, 2017.

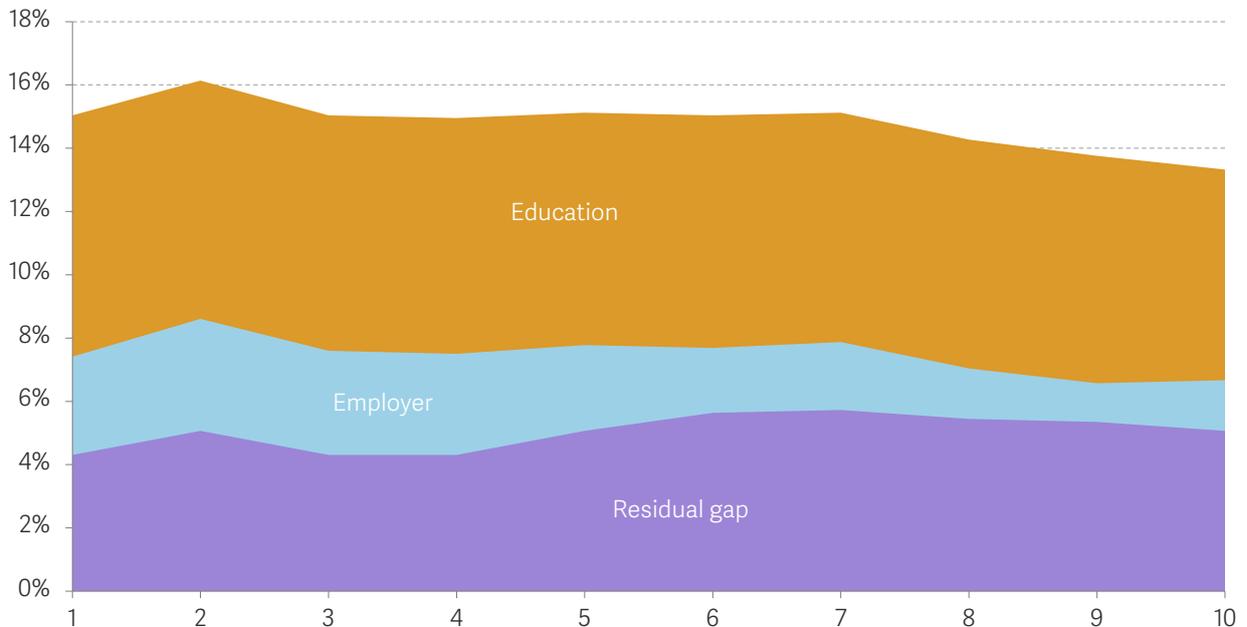
How childhood disadvantage depresses the earnings of university graduates in England

Within this, Figure 6 shows that the role of where people work in driving the gap changes most markedly. Graduates from disadvantaged backgrounds are more likely to begin their careers in lower-paying firms compared to their less disadvantaged peers. This difference accounts for around 3 per cent of the earnings gap straight after graduation. By the 10th year working after graduation, this effect almost halves as graduates who were disadvantaged gain experience and move into more similarly-paying firms to those who were less disadvantaged.

The impact of lower university attainment on earnings is largely fixed, because workers' schooling doesn't change after leaving university. The residual gap – what remains after accounting for education and employer sorting – could rise or fall but in fact fluctuates around 5 per cent, despite graduates gaining experience over time. This is an important finding. It tells us that experience gained in the labour market does nothing to offset the pay penalty associated with childhood disadvantage, except to the extent that it allows workers to move to different firms. This residual gap cannot simply be attributed to early-career trial and error in finding the right job but instead suggests childhood disadvantage continues to shape career outcomes long after the educational system has done its work.

FIGURE 6: Graduates from disadvantaged backgrounds make progress up the job ladder despite a persistent residual earnings gap

Earnings gaps associated with having been in deep poverty at age 16, over years of labour market experience after graduation: England



NOTES: Earnings gaps associated with having been in deep poverty in childhood is for graduates born between 1986 and 1989 who attended school in England. Educational sorting refers to the difference between the unadjusted earnings gap, and the gap that remains once demographic and university characteristics are accounted for. Employer sorting refers to the difference between the latter gap and the gap that remains after additionally accounting for where graduates work and who their employers are. The residual gap is the gap that remains despite controlling for all these characteristics.

SOURCE: RF analysis of DfE, Longitudinal Education Outcomes.

Policy needs to be tough on the pay gap, as well as the causes of the pay gap

This briefing note has documented a clear pattern. Childhood poverty, as measured by FSM eligibility at age 16, is associated with substantially lower earnings among university graduates in England. This holds across genders and ethnicity groups and persists over the first decade of graduates' careers. A decade after graduation, earnings are around 13 per cent lower for those who experienced deep poverty. Much of this gap reflects differences in education, and a smaller – declining – share is linked to employers. But even after accounting for these factors, a penalty of around 5 per cent remains and does not narrow with experience.

These findings point in two complementary directions for policy. First, they highlight the need for reforms to education and the labour market to improve access to high-returns degrees and jobs, and to reduce the extent to which childhood disadvantage shapes adult earnings. Second, they provide a stark reminder of the long-term costs of child poverty – and the case to make it history.

Annex 1: Details on sample and methods

Sample

Our analysis uses linked administrative data from the Longitudinal Education Outcomes (LEO) dataset, which allows us to track the education and labour market outcomes of individuals who attended school for any period of time in England. We focus on individuals born between 1986 and 1989, whose records can be linked across the education and tax administrative datasets contained in LEO, and who contain non-missing values for free school meals eligibility at age 16.

From this population we construct a graduate sample that restricts the analysis to individuals who obtained a university degree. We further restrict the sample to individuals aged 21 and above, reflecting the minimum plausible age for university graduation. The graduate sample covers labour market outcomes between 2007 and 2020, enabling us to observe graduates from shortly after labour market entry through approximately the first decade of their careers. In total, the achieved sample contains over 4.1 million observations corresponding to approximately 520,000 graduates.

Methods

The empirical analysis combines descriptive statistics with regression-based estimation to quantify the association between childhood disadvantage and graduate earnings.

The primary outcome variable is the log of annualised employee earnings, constructed from HMRC PAYE records. Earnings are annualised by the number of months individuals are observed in employment during a tax year. Observations are conditional on individuals being employed.

We estimate the following baseline specification:

$$\log Y_{it} = \beta_0 + \beta_1 \text{FSM}_i + \beta_2 \text{GradExp}_{it} + \beta_3 (\text{FSM}_i \times \text{GradExp}_{it}) + \beta_k \mathbf{X}_{it} + \epsilon_{it}$$

Where:

- Y_{it} denotes annualised earnings of individual in year .
- FSM_i is our measure of deep poverty – eligibility for free school meals (FSM) at age 16.
- GradExp_{it} represents years of labour market experience after graduation.
- \mathbf{X}_{it} is a vector of control variables including demographic, educational and labour market characteristics.

The interaction between socioeconomic background and experience allows the earnings gap associated with childhood disadvantage to evolve flexibly over the early career.

We estimate a sequence of specifications that progressively incorporate additional controls in order to examine how different mechanisms contribute to observed earnings differences. The main specifications include:

1. Basic specification, which controls for tax year effects to capture macroeconomic conditions.
2. Demographic specification, which adds controls for gender and detailed ethnicity groups.
3. University fixed effects specification, which incorporates detailed controls for university institution, degree classification and subject group, including main and interaction effects.
4. Regional specification, which adds controls for region of residence at the NUTS1 level.
5. Work characteristics specification, which includes industry section and firm size controls.
6. Firm fixed effects specification, which allows comparison of individuals working at the same employer in the same year.

This sequential approach allows us to assess how much of the unadjusted earnings gap between disadvantaged and non-disadvantaged graduates is accounted for by educational pathways, geographic location, and employer sorting.

All regressions are estimated using weighted least squares, applying reciprocal weights to account for differences in the frequency of observations across individuals in the panel.

Annex 2: Data Citations

Longitudinal Education Outcome (LEO) (data overview here):

Department for Education; HM Revenue and Customs; Department for Work and Pensions; Higher Education Statistics Agency, released 01 November 2023, ONS SRS Metadata Catalogue, dataset, Longitudinal Education Outcomes SRS Iteration 2 Standard Extract - England, <https://doi.org/10.57906/pzfv-d195>.

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