

Van der Erve, Laura; Krutikova, Sonya; Macmillan, Lindsey; Sturrock, David

**Working Paper**

## Intergenerational income persistence: Evidence for the UK

IFS Working Paper, No. W22/26

**Provided in Cooperation with:**

Institute for Fiscal Studies (IFS), London

*Suggested Citation:* Van der Erve, Laura; Krutikova, Sonya; Macmillan, Lindsey; Sturrock, David (2022) : Intergenerational income persistence: Evidence for the UK, IFS Working Paper, No. W22/26, Institute for Fiscal Studies (IFS), London, <https://doi.org/10.1920/wp.ifs.2022.2622>

This Version is available at:

<https://hdl.handle.net/10419/267957>

**Standard-Nutzungsbedingungen:**

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

**Terms of use:**

*Documents in EconStor may be saved and copied for your personal and scholarly purposes.*

*You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.*

*If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.*

Laura van der Erve  
Sonya Krutikova  
Lindsey Macmillan  
David Sturrock

22/26

Working paper

# Intergenerational income persistence: evidence for the UK

# **Intergenerational Income Persistence: Evidence for the UK**

Laura van der Erve (Institute for Fiscal Studies and University College London)

Sonya Krutikova (Institute for Fiscal Studies)

Lindsey Macmillan (Institute for Fiscal Studies and University College London)

David Sturrock (Institute for Fiscal Studies and University College London)

# 1. Introduction

Intergenerational mobility is a subject of a large literature in social science. It focuses on the association between parents' and children's economic wellbeing and receives significant attention because it speaks to the question of equality of opportunity (Torche, 2015), which many consider an important goal for society. Intergenerational mobility is a cross-cutting theme in the Deaton Review, which is touched upon in several of the core chapters, including on education, early childhood and race & ethnicity. Therefore, our aim is not to provide a comprehensive overview of this topic but rather to spotlight some of the newer directions in intergenerational mobility research within economics driven by changes in some key trends in the recent decades as well as growing availability of administrative data.

We start by providing an overview of the different ways in which intergenerational mobility has been measured, including the transmission across generations of class, occupation, education, joblessness and welfare receipt. We then narrow our focus to earned income-based measures of intergenerational mobility, which dominate the economics literature in this area, review existing evidence for the UK and present some new estimates using novel administrative data. The remainder of the paper focuses on considering the two important ways in which these estimates paint an incomplete picture of intergenerational mobility trends, beyond the well-documented concerns about measurement of earned-income. These include within country heterogeneity as well as the role of unearned income.

Until recently intergenerational mobility literature in focused on studying national trends and drawing lessons on drivers from international comparisons. Recent studies have started to show, however, that the national picture masks important and informative differences in experiences of people within countries (Chetty et al, 2014; Li&Heath, 2016). Recognising, documenting and understanding these differences is relevant in and of itself and may help uncover a richer understanding of drivers of social mobility. The ability to study within country heterogeneity in intergenerational mobility in the UK context has been greatly boosted by newly available administrative data. We summarise the handful of existing studies on this topic for the UK and present new evidence using these administrative data. We demonstrate the high degree of heterogeneity in earnings mobility which exists between individuals living in different parts of the country masked by national estimates.

Another dominant feature of the intergenerational mobility literature in economics is its focus on earned income, making the assumption that it is a good proxy for lifetime total income and ignoring sources of income other than earnings – including capital incomes and intergenerational wealth transfers received – which we refer to as “unearned income”. This may be due to the fact that these sources of were relatively less important in past decades. It may also reflect the fact that they are less widely and less well recorded in standard economic datasets. High quality data containing information on

---

these outcomes which is also linked across generations is rare. In light of the dramatic rise in private wealth to income ratios observed over the last 50 years across many advanced economies, however, a focus on earned income alone may increasingly be missing an important part of the picture. In the UK, household wealth compared to national income has more than doubled over that period (Bangham and Leslie, 2020). This growing size of wealth has come alongside a growth in the capital share of income and the size of intergenerational wealth transfers as a share of national income (Alvaredo et al, 2017). In this paper we, therefore, explicitly consider unearned sources of income, namely returns to wealth and wealth transfers received, as potentially important parts of total income. We do this by examining the data that is available on these outcomes, albeit limited, by considering persistence in wealth as potentially informative about the persistence in a wider measure of income, and by making simulations of the impact of intergenerational wealth transfers on lifetime income mobility.

Clearly, the interpretation of the trends we document and the role for policy depends crucially on the mechanisms underlying the observed associations and differences between groups. We overview the large literature which considers the role of education as a driver of earned income mobility and provide some new estimates, leveraging high quality administrative data on pupil attainment at different points in their schooling, on the mediating power of education in the national estimates as well as in explaining differences across groups within England. We then consider what patterns of heterogeneity in earned income mobility across groups may be able to tell us about a wider set of drivers of intergenerational mobility beyond education. Turning to drivers of unearned income persistence, we consider the role of intergenerational wealth transfers and returns to wealth. This analysis clearly demonstrates that drivers beyond earned income, including inheritance, are playing an increasingly important role in driving persistence of lifetime income across generations. This suggests that in the current context a focus on earned income mobility and its drivers is not enough to paint a complete picture of intergenerational persistence in lifetime income. Before concluding, we present a simulation exercise which demonstrates this.

In our conclusion we discuss policy implications and directions for future research.

## 2. Measurement and Findings in Intergenerational Mobility Research

### 2.1 Non-economics Literature

Long before economists began to study intergenerational income mobility, there was a sustained interest in the way in which social class, broadly defined as changes in occupational status alongside levels of job autonomy and security, was passed across generations. This literature typically focuses on two types of mobility – absolute mobility, the proportion of individuals ending up in different class destinations from their origins (upwards or downwards), and relative mobility, the relative chances of individuals of different class origins arriving at different class destinations, net of changes in occupational structure. Early studies by Duncan and Hodge (1963) and Blau and Duncan (1967) measured the persistence in occupational status across generations between fathers and sons using newly available data from the United States. Studies of intergenerational social class mobility in Britain and other industrial societies by Robert Erikson and John Goldthorpe culminated in the publication of 'The constant flux: A study of class mobility in industrial societies', which was noted to be 'without a doubt... the most extensive comparative study of social mobility to date' at the time of publication (Hachen, 1994). Focusing on the relationship between the social class of fathers and son from nine European countries, the US, Australia, and Japan, the research presents cross-country comparisons in absolute and relative mobility, emphasising the similarities in patterns of intergenerational class mobility across different contexts. This finding of stability in class mobility also comes through strongly in Goldthorpe's work in changes over time within Britain (Goldthorpe and Jackson, 2007, Erikson and Goldthorpe, 2011, Bukodi et al., 2015), although more recent findings have suggested that, at least in terms of absolute mobility, younger cohorts are experiencing more downward and less upward mobility than their predecessors (Bukodi and Goldthorpe, 2018).

### 2.2 Economics Literature

The economics literature has predominantly focused on lifetime income in measuring intergenerational mobility. Original estimates of intergenerational mobility from Solon (1992) and Zimmerman (1992) focused on attempting to measure the relationship between the lifetime or permanent earnings of fathers and the lifetime or permanent earnings of sons. Therefore, standard estimates of earned income mobility focus on estimating the intergenerational elasticity, represented by the coefficient  $\beta$  from a regression of log earnings of adult sons or daughters,  $y_a$ , on the log earnings or income of their parents,  $y_p$ , as shown in equation (1).

$$y_a = \alpha + \beta y_p + u_i \tag{1}$$

---

Issues of attenuation bias in the measurement of lifetime or permanent earnings of parents (usually fathers) led to understating the extent of intergenerational persistence, while approaches such as averaging across multiple periods of parents' earnings were shown to increase estimates of intergenerational persistence by reducing attenuation bias. Concerns also arise over the measurement of lifetime or permanent earnings of children (usually sons), with non-classical measurement error arising from life cycle bias leading to researchers typically underestimating the extent of intergenerational persistence if earnings are measured too early in the life cycle of sons (Jenkins, 1987, Haider and Solon, 2006, Grawe, 2006, Bohlmark and Lindquist, 2006).

An alternative metric of intergenerational persistence, the rank-rank association, represented by the coefficient  $\delta$  from a regression of the rank of earnings of adult sons and daughters,  $rank(y_a)$ , on the rank of earnings or income of their parents,  $rank(y_p)$ .

$$rank(y_a) = \alpha + \delta rank(y_p) + e_i \quad (2)$$

The rank-rank association measures the extent of re-ranking between generations, removing scale elements including both measurement issues and genuine differences in inequalities between generations (see Gregg et al., 2017 for a full discussion of the relative merits). The weakness of such metrics are that they may miss changes in mobility over time or place that are driven by changes in inequalities, or the scale of the distribution, rather than the re-ranking of individuals within a uniform distribution. The strengths, as shown by Nybom and Stuhler (2017) and Gregg et al. (2017), are that the rank-rank estimates are more stable across the life course from earlier ages, as life cycle bias predominantly works through changes in the scale of earnings after around the age of 30 for sons. An additional benefit of these type of metrics is that they allow for the inclusion of zero earnings, or non-participation, in the sample, which is predominantly a problem for estimation of intergenerational persistence for women due to the differential timing of fertility decisions by family background. Both metrics should be considered to get a complete picture of both inequality-driven mobility and the role of re-ranking.

More recently, studies have considered measures of absolute mobility, in terms of incomes. Here, the cleanest measure of absolute mobility is that used by Blanden et al. (2021), who focus on whether children earn more or less than their parents. Chetty et al. (2014) look at measures of upward or downward mobility by focusing on the earnings outcomes of those from the 25<sup>th</sup> or 75<sup>th</sup> percentile of the parental income distribution. While this is a relative metric of directional mobility at the national level, they argue that these equate to absolute measures at small area sub-national level, since incomes in these small areas have little impact on the national distribution of incomes.

## 2.3 Intergenerational income persistence in the UK

There are several comprehensive overviews of the large literature in economics on intergenerational income persistence, including, for example Black and Devereux, 2011. We restrict our focus on studies of the UK. These have typically used the national birth cohort studies, such as the National Child Development Study (NCDS) and the Birth Cohort Study (BCS), born in 1958 and 1970 respectively, to track the relationship between parental income in childhood and son's adult earned incomes. There has been relatively little reference to women within the intergenerational income mobility literature to date. This is due, in part, to the fact that *"It is frequently the case ... for 'income' to be family income in the parental generation and to be earnings in the offspring generation."* (Jäntti and Jenkins, 2013). By definition, earned incomes are only measured if individuals are working. This raises issues with regards to women's labour force participation, particularly at the time that earnings are typically measured, around age 40, when women take career breaks for family reasons. To avoid the problem of differential participation in the labour force by men and women, which, furthermore, varies by family background, studies often restrict themselves to only considering men.

Existing work has shown that intergenerational mobility declined by around 50% between these two birth cohorts using the standard intergenerational elasticity (Blanden et al., 2004, 2005). Looking across the distribution of earnings, this persistence across generations is particularly pronounced for those with the lowest and the highest pay – this resonates with the literature on intergenerational joblessness for low earners. For high earners, this suggests that there is particularly strong persistence among those working in the top jobs, with those from more advantaged backgrounds securing particularly high returns, even conditional on education (Gregg et al., 2019). In an international context, the UK has been shown to have one of the lowest intergenerational income elasticities, rivalled only among developed nations by the US (Corak, 2013, Jerrim and Macmillan, 2015).

New work on absolute income mobility has shown that the proportion of children earning more or equal to their fathers fell dramatically around the time of the last Great Recession, from a stable trend of around 60-65% earning more or equal to their fathers from 1995 up to 2008 to only around 44% experiencing this type of absolute mobility since 2010 (Blanden et al., 2021).

One way that the literature has tried to deal with the challenges of measuring mobility of women is by focussing on rank-rank estimates as mentioned in section 2.2. Another approach is to move the focus of intergenerational income mobility from the individual to the family. Papers that have taken this approach and estimated income mobility for women based on family earnings or incomes find very similar mobility estimates for men and women (Azam, 2016, Chadwick and Solon, 2002, Lee and Solon, 2009, Chetty et al., 2014a, 2014b). Previous studies from the UK which look at women and men also suggest



---

little difference in intergenerational income mobility between genders in the 1958 or 1970 birth cohort (Dearden et al., 1997, Blanden et al., 2004).

While studies of intergenerational income mobility have predominately focused on those in employment, and therefore receiving earned incomes, there is a small literature on the transmission of joblessness and welfare receipt across generations, capturing persistence in deprivation and poverty for those typically found towards the bottom of the income distribution. This relatively small literature tends to measure the relationship between the jobless status of sons in adulthood and their fathers during childhood. Macmillan (2014) shows that intergenerational joblessness has increased over time in the UK, with sons born in 1970 who grew up with a jobless father significantly more likely to be out of work for a year or more in early adulthood, compared to sons born in 1958 from a similar background. This echoes the findings discussed in the next section on income mobility with persistence in incomes increasing over time in the UK and is consistent with trends in the persistence of poverty over the same period (Blanden and Gibbons, 2006). This study highlighted for the first time the importance of local labour market conditions in driving employment opportunities of those from jobless backgrounds, with sons with jobless fathers experiencing a disproportionate penalty in bad labour markets in adulthood, relative to sons whose fathers worked when the son was in childhood. More recent studies from Zwysen (2016) and Gregg and Macmillan (2020) find similar findings in the German context and across Europe, while Gregg and Macmillan (2020) further show that countries with more generous welfare provision and greater education expenditure typically have lower associations in intergenerational joblessness.

A parallel literature focused on the association between welfare receipt across generations, with the focus here typically being on the relationship in welfare receipt between mothers and daughters (men far less likely and able to claim welfare receipt in US unless they have made significant prior contributions). Gottschalk (1996) and Levine and Zimmerman (1996) show a moderate association between welfare receipt across generations, with Levine and Zimmerman (1996) concluding that this association is predominantly driven by a poverty trap rather than a welfare trap. Dahl et al. (2014), using administrative data from Norway, in contrast show that welfare receipt in one generation causes welfare receipt in the next generation.

Studies of intergenerational education mobility typically focus on the relationship between the levels of education of parents and children across generations. These studies face fewer methodological challenges compared to studies of income or class – completed education status is often observed relatively early in the life course and stable thereafter. It is also often regarded as easier to report, since a broad category of educational achievement or the age at which an individual finished full-time schooling

will suffer from less recall bias than retrospective questions around careers or incomes. Finally completed education levels are often regarded as more comparable across contexts, at least in comparison to occupations. The study of intergenerational education mobility often lends itself more favourably than to international comparisons, where education metrics can be more easily aligned across multiple data sources. Some examples of this include the work of Blanden (2013), Chevalier et al. (2009) and Hertz et al. (2007). All studies show similar trends of low education mobility, or high persistence, in South America, US, Southern Europe, and higher mobility, or low persistence, in Scandinavia. These studies argue that although Britain does relatively well internationally, at least in terms of education mobility measures, and considerably better than the US on this metric, this picture is likely to have worsened over time with increasing educational inequality (as described in the next section for those born in late 50s compared to 70s). They also find that countries with high persistence tend to have higher levels of inequality, or higher returns to education, while countries with low persistence typically have higher levels of expenditure on education.

However, educational achievement or years of schooling is also regarded as an intermediate outcome, capturing a specific investment in individuals but failing to capture what happens thereafter. For this reason, education in the intergenerational income literature is often framed as a key mechanism through which lifetime or permanent income is transmitted across generations, rather than an outcome in itself (Becker and Tomes, 1986, Solon, 2004). Empirical studies, such as Blanden et al. (2007), used these theoretical foundations to develop applied frameworks for analysing the contribution of human capital to the transmission of incomes across generations. The applied approach to estimating the role of human capital as a driver of earned income im(mobility) focuses on three important components: a) educational inequality, or the relationship between family childhood circumstances and educational achievement, b) returns to education, or the labour market pay-off to investing in education, and c) the direct association between family childhood circumstances and adult earned income, conditional on educational achievement.

Blanden et al. (2007) found that human capital could account for around 50% of the transmission of earned incomes across generations for the UK birth cohorts, and for 80% of the decline in mobility between the 1958 and 1970 cohort. While returns to education and the direct association between family circumstances and adult earned incomes remained stable across cohorts, the main reason for this increased immobility or persistence was primarily due to an increasing relationship between family incomes in childhood and educational attainment, or an increase in educational inequality.

## 2.4 Some new estimates for England

Recent advancements in administrative data linkages have meant that we are able to generate new estimates of intergenerational mobility at the national level for more

---

recent cohorts. For this we use the new Longitudinal Education Outcomes (LEO) data which links school records from the National Pupil Database (NPD) and university records from the Higher Educational Statistics Agency (HESA) with HMRC earnings and employment data and Work and Pensions Longitudinal Study (WPLS) benefits data. A big drawback of the data currently available is that it does not contain measures of parental income. However, it does include data on individual level Free School Meal (FSM) status and the small area of residence at 16. In our cohorts of analysis, 12.5% of students were eligible for FSM at age 16. FSM eligibility, therefore, broadly identifies the 12.5% of individuals in the data who were coming from the lowest income families. Furthermore, information on small area of residence at age 16 makes it possible to construct a measure of parental socio-economic status (SES) by combining several local area deprivation measures from 2001 (around the time when the child was living there). These include housing tenure (% of individuals who own their home; % of individuals who are council tenants), occupation (% of those in work in higher and lower professional and managerial occupations; % working in routine occupations; % long-term unemployed), education (% with at least Level 4 qualifications; % with no formal qualifications) and poverty (proportion of children aged 0 to 15 living in income-deprived households from the Income Deprivation Affecting Children Index). They are combined into a single index of socio-economic status (SES) using principle component analysis<sup>1</sup>.

Carneiro et al. (2020) present the first individual-level estimates of intergenerational mobility for England for three cohorts of state-educated boys who were born 1986-1988, using this data. They estimate relative and upward mobility based on a) the rank-rank estimates of sons' earnings at age 28 on parental SES at age 16, and b) the rank-rank estimates of sons' earnings at age 28 of sons from families eligible for FSM at age 16. In Figure 1 and Table 1 we reproduce the estimates for sons, adding those for daughters. Individuals with no earnings are included and assigned the average rank of individuals with zero earnings.<sup>2</sup>

---

<sup>1</sup> New analysis by Jerrim (2020) studies the association between this type of measure and observed permanent childhood income in the longitudinal Millennium Cohort Study (MCS). He finds that this type of measure closely tracks the relationship between permanent family income and children's educational achievement across the entire distribution of family circumstances, which suggests that this is a valuable resource for tracking socio-economic gaps in outcomes, as it is used here.

<sup>2</sup> To give an example of how this works, let's assume 20% of individuals have no earnings. All individuals with zero earnings will be assigned to the 10<sup>th</sup> percentile rank, while the lowest earning individual with positive earnings will be assigned to the 21<sup>st</sup> percentile.

Figure 1: Relationship family background and age 28 earnings rank by gender

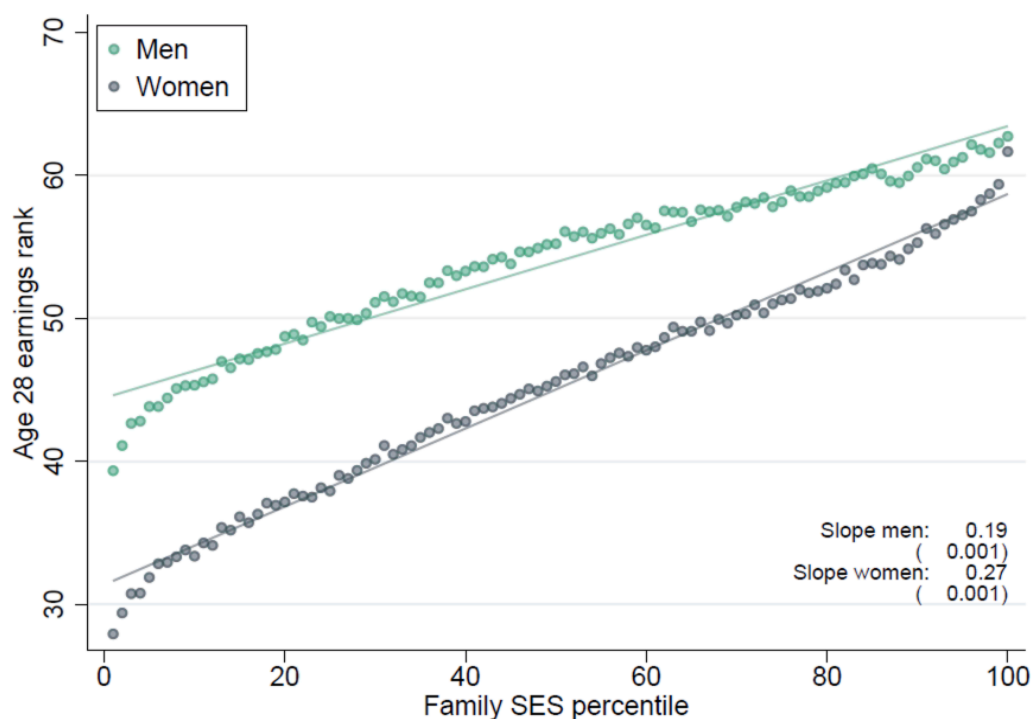


Table 1: Mobility at age 28 for young people in England born in 1986-1988

|  | Men     | Women   |
|--|---------|---------|
| <b>Rank-rank slope</b>                     | 0.19    | 0.27    |
| <b>Average rank of FSM children</b>        | 42      | 32      |
| <b>Median earnings of FSM children</b>     | £13,500 | £6,600  |
| <b>Median earnings of non-FSM children</b> | £21,200 | £16,000 |

Sons from the most affluent families were on average around 19 percentiles higher in the adult earnings rankings than sons from the most disadvantaged families. Although measures of family childhood circumstance vary across surveys, this is broadly in line with estimates for men only from the BCS cohort (born in 1970) where rank-rank estimates of relative mobility for sons in England are around 0.22 at age 26 (Gregg et al., 2017). This suggests that, at least in terms of re-ordering individuals within a distribution, earned income mobility has remained relatively stable over time.

---

Estimates can also be presented for women at the same age, where, as discussed before, we include individuals with zero earnings in the ranking. Estimates indicate that daughters from the most affluent families on average end up around 27 percentiles higher in the adult earnings rankings than daughters from the most disadvantaged families. Note that the LEO data only includes annual earnings and so no adjustments can be made here for part time work. These estimates therefore capture inequalities in annual earnings between daughters from different backgrounds, including the potential consequences of differential fertility patterns leading to more part time work among those from more disadvantaged backgrounds at age 28.

Table 1 also shows estimates of relative upward earnings mobility for those sons and daughters who were eligible for Free School Meals at age 16. Those eligible for free school meals are broadly equivalent to the bottom 12.5% of individuals in our sample nationally. The results suggest that there is a fair degree of relative upward mobility for both sons and daughters: sons from families that were from the 6<sup>th</sup> percentile on average (given FSM equates to bottom 12.5%) attain the 42<sup>nd</sup> percentile of earnings on average by age 28 and daughters – 32<sup>nd</sup>. While again there are differences between measures of family childhood circumstances, we can get some sense of how this compares internationally by using findings from Acciari et al. (2019) for Italy, and Chetty et al., (2014a) from the US. These findings suggest that someone from the bottom 12% in Italy is expected to reach the 39<sup>th</sup> percentile of earnings while in the US, the corresponding individual is expected to reach the 35<sup>th</sup> percentile. Combining across genders for England places a similar individual at the 38<sup>th</sup> percentile, meaning that the estimates of upward mobility for England lie between those from Italy (more mobile) and the US (less mobile).

Taken together, these findings suggest that women may be less mobile in terms of their earned income than men at this given point in their life cycle (age 28). Note that the mobility rate of women at this age is likely to be affected by differences in female labour force participation – while we can observe whether individuals are in work, we cannot observe or adjust for hours worked in the administrative data. Given that women from lower income backgrounds typically have children at younger ages, and therefore may work fewer hours at this earlier point in their careers than women from high income backgrounds, their mobility rates are likely to vary across the lifecycle.

One of the strengths of the newly linked administrative LEO data, relative to other countries, is that it contains very detailed information on educational achievement from school records, including grades across subjects studied in the national General Certificates of Secondary Education (GCSEs) taken at age 16, and similar information from the Advanced General Certificates of Education (A levels) taken at age 18. There is also information on individuals' assessments at the end of primary school (Key Stage 2 Assessments), which are standardised externally set and marked tests, and on the

university course attended, including the subject studied and institution attended post-18 for those who continue into higher education.

We can use this detailed information to assess the role of educational achievement in accounting for the rank-rank association, following on from Carneiro et al. (2020) who report findings for men only. Using detailed information of individuals' educational achievement, Table 2 shows that 71% of the rank-rank association between children's and their families' incomes could be accounted for by education for both men and women, with the remaining 29% unaccounted for potentially picking up differences in unmeasured skills and wider inequalities in the labour market that persist for people with similar levels of education. These can include things such as wider social networks, access to internships, and broader cultural differences between people from different backgrounds (Friedman and Laurison, 2019).

Interestingly, these findings are relatively consistent whether measures of education up to age 16 are used, or whether further measures of achievement up to age 18 or 21 are added, suggesting that age 16 achievement is a key predictor of intergenerational transmissions (consistent with previous findings such as Blanden et al., 2007). These estimates are higher than those found in the cohort studies, although the cohort studies estimates focus on men only. This could be driven by the greater level of detail and smaller amount of measurement error found in the administrative data in terms of educational achievement. It needs to be kept in mind that there are important differences in the sample and the measurement of family circumstances across studies, hence caution is urged when interpreting these differences in findings across studies.

**Table 2: Contribution of education to relationship between family circumstances and children's earnings' rank**

|                                   | Men             |                      | Women           |                      |
|-----------------------------------|-----------------|----------------------|-----------------|----------------------|
|                                   | Rank-rank slope | % of total explained | Rank-rank slope | % of total explained |
| No controls                       | 0.190           |                      | 0.273           |                      |
| Controlling for educ up to age 11 | 0.126           | 33%                  | 0.179           | 34%                  |
| Controlling for educ up to age 16 | 0.057           | 70%                  | 0.089           | 67%                  |
| Controlling for educ up to age 18 | 0.055           | 71%                  | 0.081           | 70%                  |
| Controlling for educ up to age 21 | 0.056           | 71%                  | 0.080           | 71%                  |

The contribution of education to the overall rank-rank association between parents and children's incomes works through two channels. Firstly, it depends on the relationship between family circumstances and educational achievement (education inequality). This relationship is illustrated in Figure 2. there is very little difference in the gradient of educational inequalities between men and women suggesting that girls and boys typically get similar inputs by socio-economic status. The figure shows that someone from the most affluent of families on average scores around 40 percentiles higher in the age 16 achievement distribution than someone from the most deprived of families.

Figure 2: Educational achievement by family circumstances at age 16

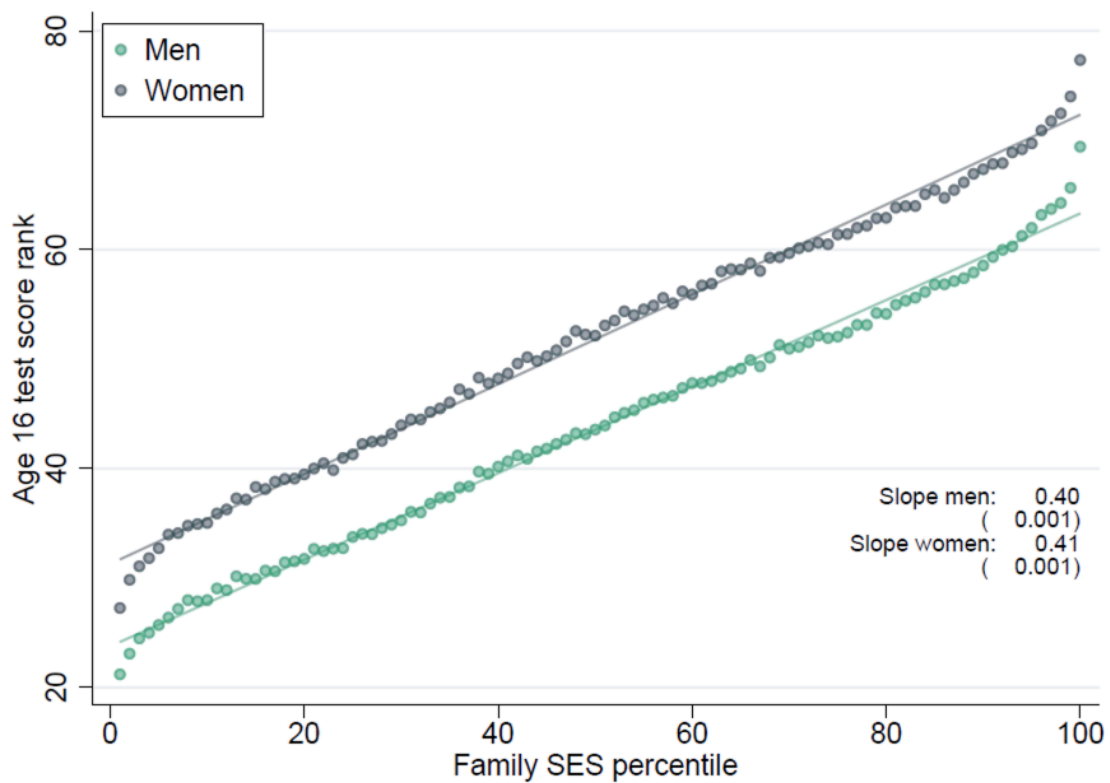
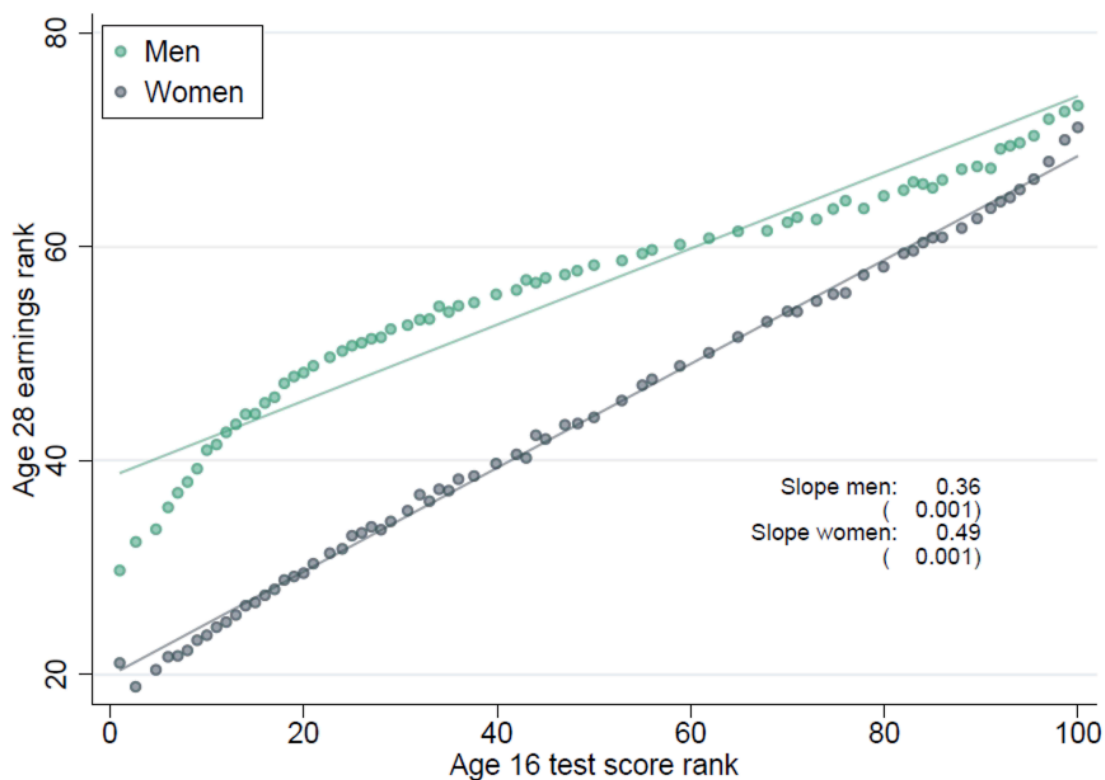


Figure 3 then shows the association between educational achievement at age 16 and the adult earned income ranking of sons and daughters – or the average earnings rankings of those at each point in the educational achievement distribution. We can see that for sons, the highest achieving are expected to end up 36 percentiles higher on average than the lowest achieving in terms of earned incomes at age 28. For daughters, the picture is more stark, with the highest achieving expected to end up 49 percentiles higher than the lowest achieving in terms of earned incomes at age 28.



Figure 3: Labour market earnings at age 28 by educational achievement at age 16



Our review and estimates so far has focused on documenting the association between earnings of parents and children at the national level and the role of education as a mechanism, in line with much of the existing literature on intergenerational mobility in economics.

Improving availability of data has, however, opened up opportunities for new promising directions of research in this area. This is what we focus on in the remainder of this paper. First, in Section 3, we hone in on the issue of the degree to which national estimates mask important differences in life chances of different groups within one country – this is an issue brought to prominence in the last decade through high profile work by Raj Chetty and various co-authors who showcased the promise of administrative data for studying these differences, how significant they can be and the potential for learning about drivers of intergenerational mobility from them. Second, in Section 4 we examine the degree to which intergenerational persistence is in fact mis-measured as the result of omission of sources of income beyond earnings from the analysis in traditional intergenerational mobility literature.

### 3. New directions: within country heterogeneity

Until recently intergenerational mobility literature in economics and sociology tended to focus on studying national trends and drawing lessons on drivers from international comparisons. Recent studies have started to show, however, that the national picture masks important and informative differences in experiences of people within countries and that these differences are, in some instances, as significant if not more so than those between countries (Chetty et al, 2014; Li & Heath, 2016). Recognising, documenting and understanding these differences is important in its own right – to document differences in opportunities that different groups within a country face. It may also help uncover a richer understanding of drivers of social mobility.

We focus on differences in social mobility in England by geography, reviewing existing literature and exploiting newly available administrative data to advance the analysis. We leverage NPD-LEO linked administrative data described above. In this analysis we use only the upward mobility measure - the rank earnings at age 28 of individuals from families eligible for FSM at age 16. We do use the relative mobility measures as our analysis suggests that the parental SES measure, which we use to construct national relative mobility estimates above, is not suitable for cross-group comparisons because it does not map to family lifetime income in the same way for each of these groups.

The focus on variation in social mobility by geography is motivated by recent evidence from several countries suggesting that within country geographic variation in intergenerational mobility, even across small, neighbouring areas can be very substantial. This strand of work was pioneered by Raj Chetty and his collaborators who first showed this for the U.S. using administrative tax data. Their estimates had a profound impact for several reasons.

There was already an established literature in sociology and economics, among others, documenting the importance of schools and neighbourhoods for child development. Linking this to adult earnings, and leveraging the coverage in administrative data to produce analysis at small area level, Chetty's estimates brought under a bright spotlight just how geographically unequal the distribution of life chances is in the U.S. Most strikingly they showed that these differences exist between adjacent neighbourhoods. The significance of these findings for policy and public debate about equality of opportunity in the "Land of Opportunity" was one reason why the work attracted significant attention and has since been replicated for many countries (e.g. Sweden (Heidrich, 2017), Italy (Acciari et al., 2019), Norway (Carneiro et al., 2022)).

Another reason is that from a scientific perspective Chetty's findings offered a treasure trove of new avenues to explore in trying to disentangle the key mechanisms underlying intergenerational mobility estimates. Prior to Chetty's work, intergenerational mobility

---

literature focused on leveraging cross-country variation in order to tease out potential mechanisms. The challenge in this work was always that even the most similar countries differ in too many cultural, institutional and policy dimensions for clean identification of drivers of differences in intergenerational mobility. The demonstration in Chetty's and subsequent work that variation within countries can be as substantial if not more so than across opened up possibilities for studying drivers of differences holding many more contextual factors truly constant than was possible in cross-country analysis. Of course this does not address the issue that people are not allocated across places randomly which presents a serious challenge to causal identification of drivers of intergenerational mobility. Nevertheless, several studies have provided interesting estimates of associations between within country geographic variation in intergenerational mobility and neighbourhood characteristics that, at the very least, motivate new hypotheses regarding potential drivers of the variation.

Until recently, researchers working on intergenerational mobility in the UK have had to rely on longitudinal surveys with samples which are too small to estimate how mobility varies across the country (e.g. Blanden et al., 2004; Gregg et al., 2017). A recent paper (Bell et al., 2018) uses a 1% sample of the linked census to estimate mobility across broad areas in England in terms of occupation, education and homeownership. The NPD-LEO data that we have been using in this paper provides a unique new opportunity to study geographic variation in intergenerational mobility in England at a more granular level and using precisely measured earnings as the outcome.

This is what we are doing in ongoing work with additional co-authors (Carneiro et al, 2022). We reproduce some of this analysis in Figure 9 and Figure 10, which show upward mobility, measured in the same way as in Section 3.1<sup>3</sup> calculated separately for each of the 152 Local Authorities (LAs) in England.<sup>4</sup> Local authorities are divided into quintiles and color coded so that 20% of LAs with the highest mobility are the lightest color and 20% with the lowest are the darkest color.

First, where disadvantaged children grow up in England matters: the difference between the lowest and highest mobility LAs is nearly 17 percentiles of earnings at age 28 for both women and men (Figure 9 and Figure 10) and . Second, especially for women, least mobile areas are not all clustered in one part of the country; instead they are spread out across broad areas of Yorkshire including Hull, East Midlands such as Nottingham, and the North East, including Middlesbrough. The most mobile areas for women include the Inner London boroughs, and some parts of Outer London.

---

<sup>3</sup> Mean earnings rank at age 28 among those born in mid-late 1980's and eligible for FSM at age 16

<sup>4</sup> The analysis is at the level of upper-tier Local Authorities as defined in the most recent, 2011 census. The average population of an upper-tier local authority is just over 320,000 individuals, though there is significant variation in size.

For men we see a North to South-East gradient. Mobility is consistently low in the North of the country, and highest in the South-East. The areas around London and Outer London boroughs - though interestingly not Inner London - account for virtually all of the 20% highest mobility areas. These findings align closely with those of Bell et al. (2018). Using a slightly younger cohort (born 1974-1983) and looking at occupational mobility, they find a similar North to South East gradient, and a strong difference between inner and outer London, with the former being among the least mobile areas, while the latter is among the most mobile.

Finally, there is not a clear urban rural pattern to mobility for women and men. While some parts of London have very high mobility, the urban areas around northern cities such as Manchester, Leeds and Newcastle are among the lowest mobility areas in the country.

**Figure 4: Mean age 28 earnings rank of children on FSM – women**

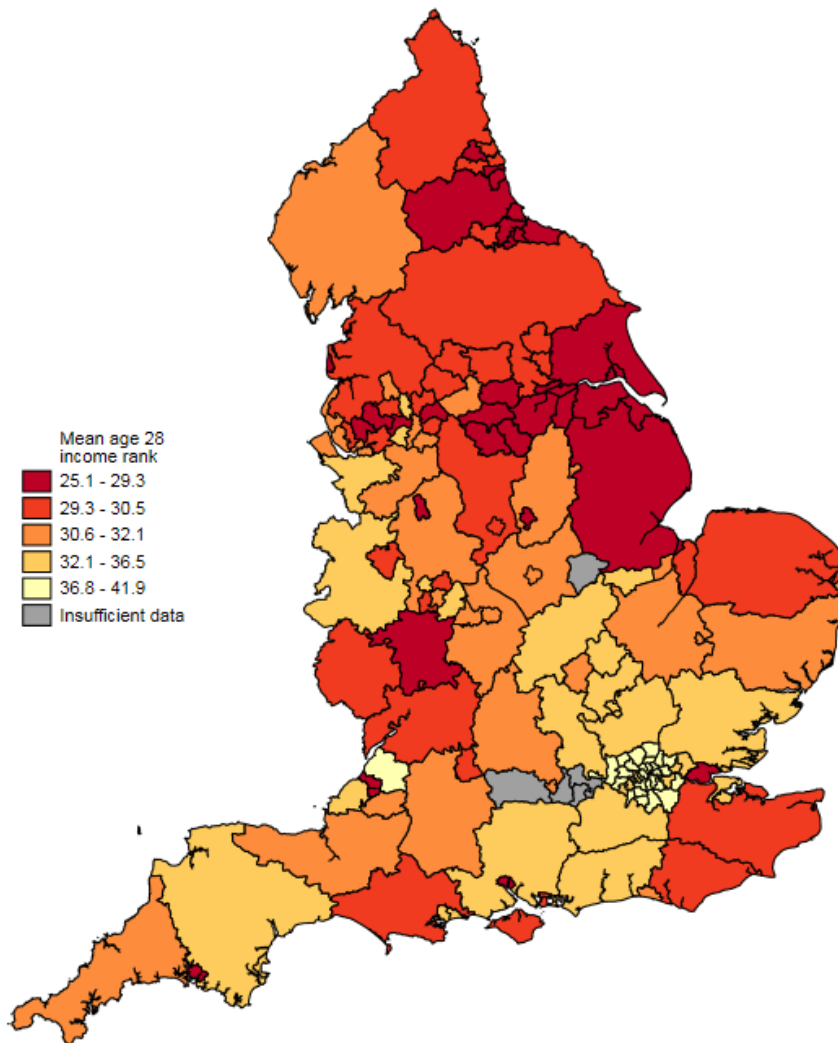
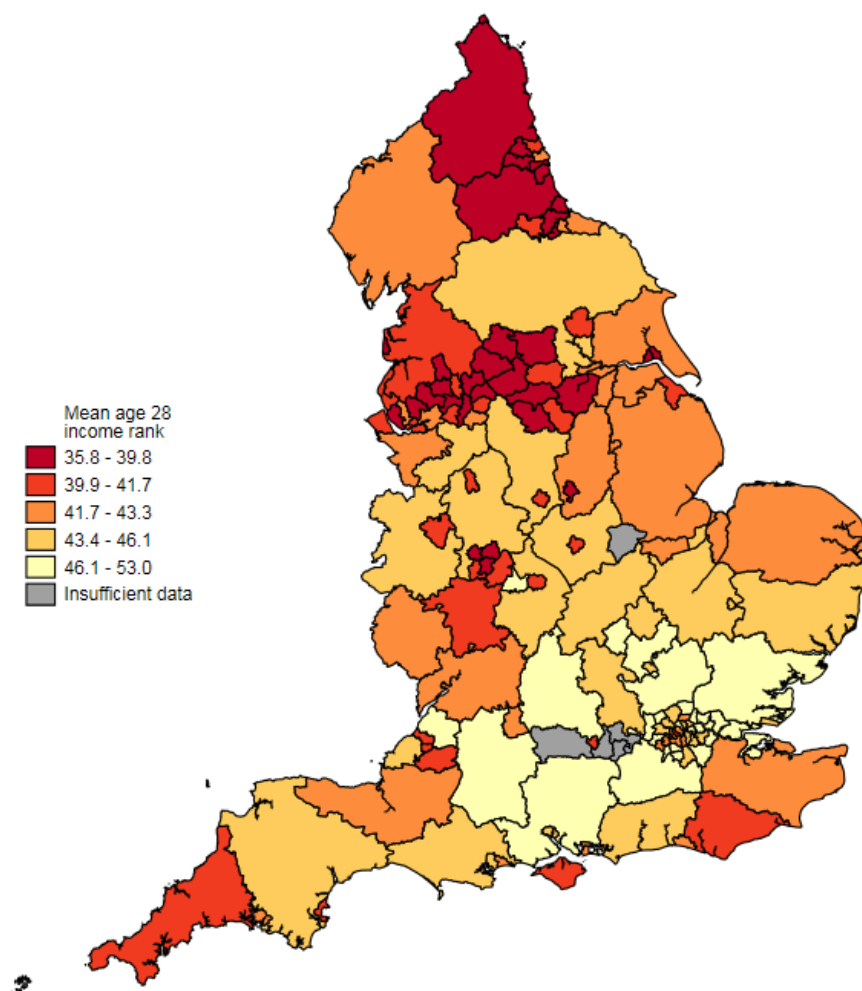


Figure 5: Mean age 28 earnings rank of children on FSM – men

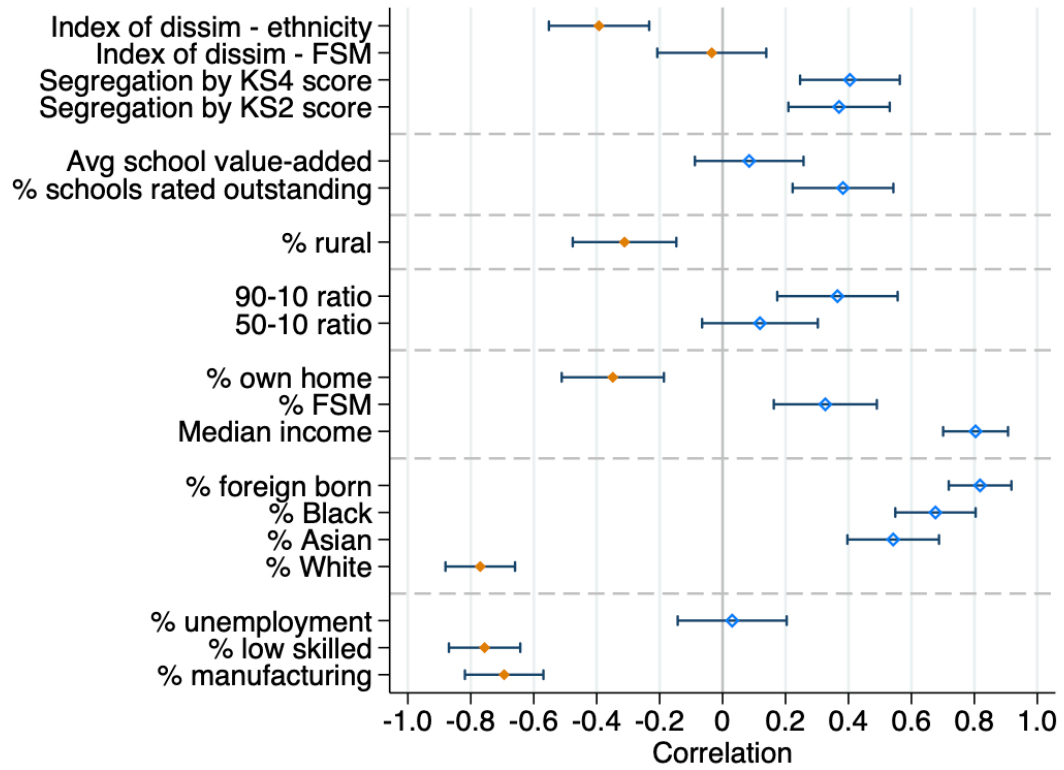


Having established the degree and pattern of geographic variation in upward social mobility in England, Carneiro et al examine how important variation in education is as driver of these differences. They implement a decomposition of the variance in upward income mobility across areas into a component which can be explained by differences in educational attainment and the return to education in the labour market and a remainder that is due to other differences. They find that for both men and women less than half of the variation across LAs in upward income mobility of individuals from disadvantaged backgrounds can be explained by variation in educational achievement (accounting for achievement from age 11 to university). Furthermore, a much larger proportion of mobility variation is explained by variation in education for women than for men, at 46% and 25% respectively.

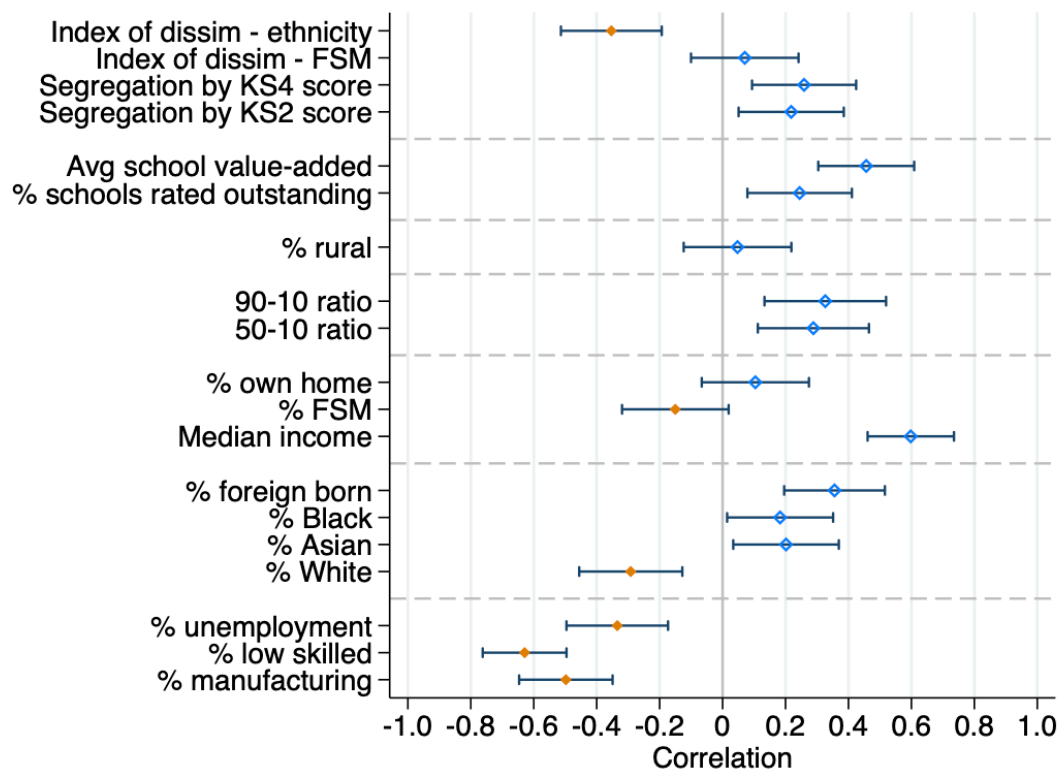
These findings suggest that although differences in education are an important driver of geographic variation in upward mobility in England, non-education factor also play a key. Carneiro et al combine several data-sources to construct measures of a range of characteristics at the LA level, including labour market, demographic composition; family stability; income inequality; urbanity; degree of educational, socio-economic and ethnic segregation in schools; school quality.

Figure 6 and Figure 7 plot correlations between area effects in upward income mobility which exclude the component explained by educational attainment and measures of local area characteristics.

**Figure 6: Correlation of area characteristics with mean earnings rank FSM women**



**Figure 7: Correlation of area characteristics with mean earnings rank FSM men**



Finally, in the Appendix we show some additional heterogeneity analysis, also splitting the sample by ethnicity.

## 4. New Directions: the role of unearned income

Earnings are not the only source of income. Income also comes from returns to wealth and transfers received. As stated in the Introduction, we refer to these other components here as ‘unearned income’. We will focus on private transfers of wealth and not public transfers received. While public transfers are a large part of income for a significant proportion of individuals, they are not as clearly related to parental background, conditional on earned incomes, as private transfers are (though research on the intergenerational transmission of social security take-up does show there are links here too).

The intergenerational persistence of total income depends on the persistence in earned income, the persistence in unearned income, the relative importance of earned and unearned income in total income, and the strength of association between these two components of lifetime income.<sup>5</sup> That means that if children’s unearned income were more related to their parents lifetime income than earned incomes, for example, then a shift whereby unearned income made up a greater share of children’s incomes would mean that lifetime income mobility would fall.

Existing literature on social mobility tends to focus on earned income persistence, implicitly assuming that it is a good proxy for lifetime income persistence i.e. implicitly assuming that unearned income is an unimportant component of total income or that it is highly correlated with earned income, or some combination of these assumptions. Earned income persistence would be a good proxy for lifetime income persistence in a situation where intergenerational wealth transfers were small and capital incomes were either small or unrelated to someone’s parental background.

Unearned income sources may have been overlooked in the social mobility literature in the past because these sources of income were indeed relatively less important in past decades. It may also reflect the fact that intergenerational wealth transfers and capital incomes are less widely and less well recorded in standard economic datasets. High quality data containing information on these outcomes which is also linked across

---

<sup>5</sup> We can show this formally. Denoting lifetime income of generation  $t$  as  $Y_t$ , and earned and unearned income as  $Y_t^e$  and  $Y_t^u$ , respectively, the intergenerational correlation in lifetime income can be decomposed as follows

$$\text{corr}(Y_t, Y_{t-1}) = \frac{\text{cov}(Y_t^e, Y_{t-1}^e) + \text{cov}(Y_t^u, Y_{t-1}^u) + \text{cov}(Y_t^e, Y_{t-1}^u) + \text{cov}(Y_t^u, Y_{t-1}^e)}{\sqrt{\text{var}(Y_t^e) + \text{var}(Y_t^u) + 2\text{cov}(Y_t^e, Y_t^u)} \sqrt{\text{var}(Y_{t-1}^e) + \text{var}(Y_{t-1}^u) + 2\text{cov}(Y_{t-1}^e, Y_{t-1}^u)}}$$

From this we can see that the overall correlation is the weighted sum of the intergenerational covariances of earned and unearned income, as well as the cross-terms of the covariance of earned child and un-earned adult income and vice-versa. This gives us that the overall correlation depends on the strength of persistence in each component, as well as their association. Note further that for both components of income  $c$ ,

$$\lim_{\text{cov}(Y_t^c, Y_{t-1}^c) | \text{corr}(Y_t^c, Y_{t-1}^c) \rightarrow \infty} \text{corr}(Y_t, Y_{t-1}) = \text{corr}(Y_t^c, Y_{t-1}^c)$$

This says that in the limit, as the amount of variation in one of the two elements of lifetime income increases, holding its intergenerational correlation fixed, the intergenerational correlation in lifetime income tends towards the intergenerational correlation of that component of income.



---

generations is rare. However, as noted in the introduction, the growth in the size of household wealth compared to incomes in the UK, as in many advanced economies over the past 40 to 50 years, has been accompanied by a growth in the size of capital income and intergenerational wealth transfers, as a share of national income.

A comprehensive assessment of the contribution of unearned income to the persistence of lifetime income across generations would need to employ measures of lifetime income, including both earned and unearned components, for multiple linked generations. Data that would allow such an analysis for the UK does not exist and we are not aware of any such studies from other countries.<sup>6</sup>

One way of assessing whether there is an important role for unearned income in driving lifetime income mobility is to examine intergenerational *wealth* mobility. Examining intergenerational wealth mobility is informative about overall lifetime income mobility because wealth is accumulated from both unearned as well as earned income and, as a stock, is influenced by income over all of the preceding years of someone's life.<sup>7</sup>

One test of whether there appears to be a role for unearned income is as follows. If earned income persistence were the only driver of lifetime income persistence and saving rates conditional on level of earnings were not persistent across generations, then rank-rank measures of wealth mobility would be the same as rank-rank measures of earned income mobility. The reason for this is that in this case the only systematic driver of wealth differences between those with richer and poorer parents would be differences in earnings. The persistence in wealth ranks would be driven by the persistence in earnings ranks and could not exceed the level of persistence in earnings. On the other hand, if a rank-rank measure of the intergenerational persistence of wealth is higher than that for earned income then this suggests a role for direct transfers of wealth from wealthy parents to their children, or that returns to wealth or savings decisions vary by parental background and lead to greater wealth accumulation for those with higher-earning and wealthier parents. We can therefore assess whether there looks to be a role for unearned income by assessing whether position in the wealth distribution is more persistent across generations than position in the distribution of earnings.

---

<sup>6</sup> Justman and Stassnie (2021) make estimates of the intergenerational persistence in lifetime income but it is not clear that their measure of lifetime income would capture intergenerational wealth transfers. Adermon et al. (2018) employ data which links multiple generations and includes data on inheritances but their focus is in explaining intergenerational wealth mobility rather than lifetime income mobility. Boserup et al. (2017) sets out conditions under which the intergenerational correlation in 'lifetime resources' (the sum of earned income and transfers from previous generations) can be inferred from the intergenerational correlation in wealth and makes such an estimate for Denmark.

<sup>7</sup> See Boserup et al. (2017) for a simple model setting out relationships between earned income, wealth transfers and lifetime income.

Closely related to this test, we can assess what factors might be important in driving the persistence of lifetime income by examining which factors look to be driving the persistence of wealth. Consider the following thought-experiment. Among a group of children, we compare those with more and less wealthy parents. We would find that those with wealthy parents are wealthier themselves than those with poorer parents. We then ask whether, among a group of children with the same level of earnings, we find any differences in those children's wealth when comparing those with wealthier and poorer parents. If we do not find any such differences, we may think it likely that earnings are the main channel through which differences in lifetime income persist from one generation to the next. If we do find that wealth is higher for those children with wealthier parents, even when comparing those with the same level of earnings, then we might think it likely that transfers of wealth or returns to wealth are playing a role. We could then assess this by examining whether those children who were wealthier had received more in intergenerational transfers or were more likely to hold high-return assets. Examining which factor 'explained' wealth gaps, in a statistical sense, would be indicative of which factors are likely to be important drivers of lifetime income persistence.

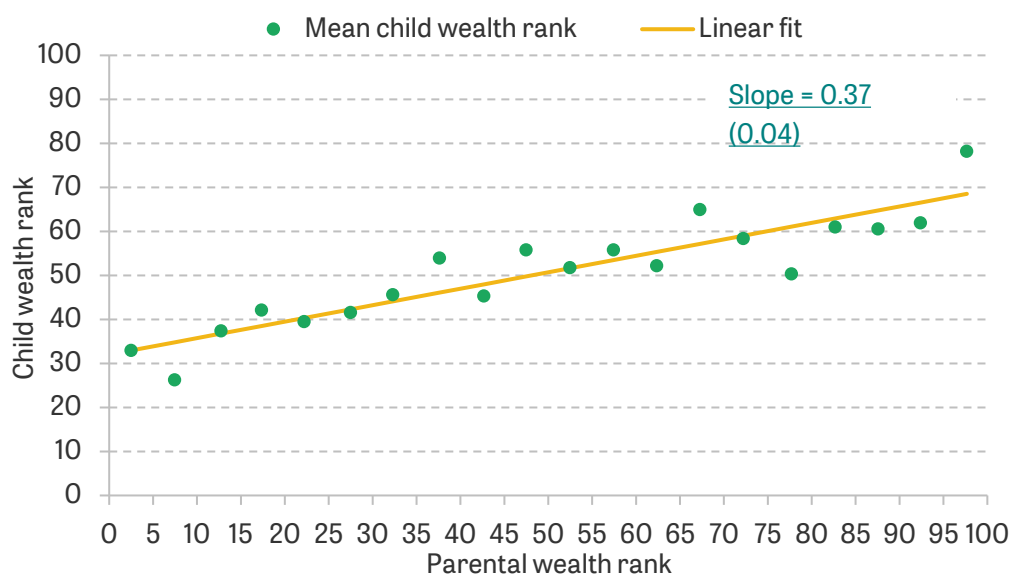
These tests are not perfect. Firstly, wealth persistence that is driven by persistence in saving rates across generations does not reflect a role for unearned income persistence. This is because differences in saving rates are differences in when in life people choose to spend their income, not differences in the level of lifetime income. However, the two other factors that could drive wealth persistence – returns to wealth and intergenerational wealth transfers – do represent additions to lifetime income. The second shortcoming is that quantifying wealth persistence and its drivers does not mean that we have quantified lifetime income persistence and its drivers, just that we have strongly suggestive evidence of which factors are likely to be important in driving lifetime income persistence. That means that while the extent and drivers of wealth mobility can be strongly suggestive of the extent and drivers of lifetime income mobility, we cannot simply infer the latter from the former.

Intergenerational wealth mobility has been studied using similar metrics to those employed in the study of income mobility. There are a number of methodological issues involved with the estimation of intergenerational wealth persistence. Most of these are analogous to the issues involved in measuring earnings mobility and discussed above, such as lifecycle bias, treatment of zero and negative values, and attenuation of estimates due to measurement error (see Boserup et al. (2017) for discussion).

Recent work has measured intergenerational wealth mobility in the UK. Figure 4, reproduced from Davenport et al. (2021) shows an estimate of the rank-rank relationship between parents' and their children's wealth for those children born in the UK between 1974 and 1986. Children's wealth was measured between age 30 and 42. This employs data from the British Household Panel Study and its successor,

Understanding Society (BHPS/USoc) to construct a measure of wealth that is the sum of housing wealth, financial assets such as savings accounts and stocks and shares and ISAs, net of debts including mortgage debt and unsecured debts such as loans and credit card debt. Davenport et al. (2021) estimate a rank-rank slope for wealth of 0.37 and an intergenerational wealth elasticity, also equal to 0.37. The results shown in the figure use a child's individual wealth. If using the child's household wealth instead, the rank-rank estimate is 0.36 and the elasticity estimate is 0.39.

**Figure 8: Rank-rank relationship in wealth for those born in 1974 to 1986 in the UK**



Source: Davenport et al. (2021).

Note: Child wealth is measured between age 30 and 42. Parents' wealth is an average of observations from 2000 and 2005. Rankings are made within age-groups (and within year of observation in the case of children).

There are two other recent estimates of intergenerational wealth persistence in the UK. Blanden et al. (2021) used the intergenerational correlation in homeownership – measured in various datasets – and relationship between homeownership and wealth rank – estimated using the Wealth and Assets Survey – to estimate a rank-rank slope for wealth of between 0.38 and 0.46. These estimates use a definition of wealth that includes pension wealth, which is measured in the Wealth and Assets Survey (WAS) but not BHPS/USoc. Blanden et al. (2021) also find that the relationship between parents' and children's homeownership strengthened between 2000 and 2015 and infer that wealth mobility therefore declined over this period. Gregg and Kanabar (2021), using a two-stage estimator and data from WAS, find a wealth elasticity of 0.35 and rank-rank slope of around 0.3, but also find that intergenerational wealth persistence is higher for younger generations (with an elasticity of 0.4 for those in their 30s in recent years i.e. primarily the 1980s-born) than older generations. Despite slightly varying definitions of wealth persistence and the use of different methods and different datasets, these three existing UK estimates of wealth persistence are consistent with each other and with

rank-rank and elasticity measures for those in their 30s or early 40s in recent years of around 0.4.

How should we interpret these measures of intergenerational wealth persistence in the UK? One way of putting these into context is to make international comparisons. In the United States, Charles and Hurst (2002) estimated an intergenerational elasticity of household wealth of 0.37, with Pfeffer and Killewald (2015) and Gayle and Hincapié (2016) finding similar results. This is substantially higher than the estimated elasticities of 0.24 for Denmark (Boserup et al., 2017) and 0.23 for Norway (Fagereng et al., 2021). Using individual-level wealth, Adermon et al. (2018) and Black et al. (2020) estimated elasticities for Sweden of 0.32 and 0.25, respectively.<sup>8</sup> Wealth persistence therefore appears to be higher in the UK than in Scandinavian countries and to be comparable to that in the US.

A key question, given our focus, is whether the intergenerational persistence in wealth can be explained simply by the intergenerational persistence in earnings, suggesting no additional role for unearned income in driving the persistence of lifetime income, or whether wealth persists from generation-to-generation over-and-above that which is explained by earnings persistence. A consistent finding across the literature calculating the intergenerational persistence of wealth is that a minority of wealth persistence can be attributed to persistence in earnings. For example, Charles and Hurst (2003) find that the intergenerational elasticity of wealth reduces by around a quarter to a half when conditioning on earnings in the US and the equivalent figure from Adermon et al. (2018) for Sweden is a quarter.<sup>9</sup> Consistent with this, Boserup et al. (2017) report a significantly higher rank correlation of wealth (0.27) than of income (0.20) for Denmark, suggesting a potentially substantial role for unearned income in driving wealth persistence.

For the UK, Davenport et al. (2021) find that around half of the intergenerational persistence in wealth can be explained by the intergenerational persistence of education and earnings. This means that the transmission of human capital and earnings potential is an important driver of wealth persistence but that other factors are very important too. The fact that the rank-rank measure of wealth persistence is higher than those we have seen for earned income is also strongly suggestive of a role for factors other than earnings persistence in driving wealth persistence.<sup>10</sup> This stronger persistence of wealth ranks than earnings ranks is found also within the sample of Davenport et al. (2021), where the rank-rank persistence measure for earnings is 0.27 (compared to 0.37 for

---

<sup>8</sup> The estimated wealth rank correlation in Adermon (2018) is 0.39, suggesting that lifecycle bias may attenuate their elasticity estimate. This compares to a rank-rank estimate of 0.35 in Black et al (2020).

<sup>9</sup> Also using Swedish administrative data, Black et al. (2020) find a negligible effect on the estimated relationship between parents' and childrens' wealth of including controls for parents' earnings.

<sup>10</sup> If savings rates are on average increasing in earned income, and there were no intergenerational persistence in unearned income, then we would expect the rank-rank slope measures of earnings and wealth persistence to be equal.

---

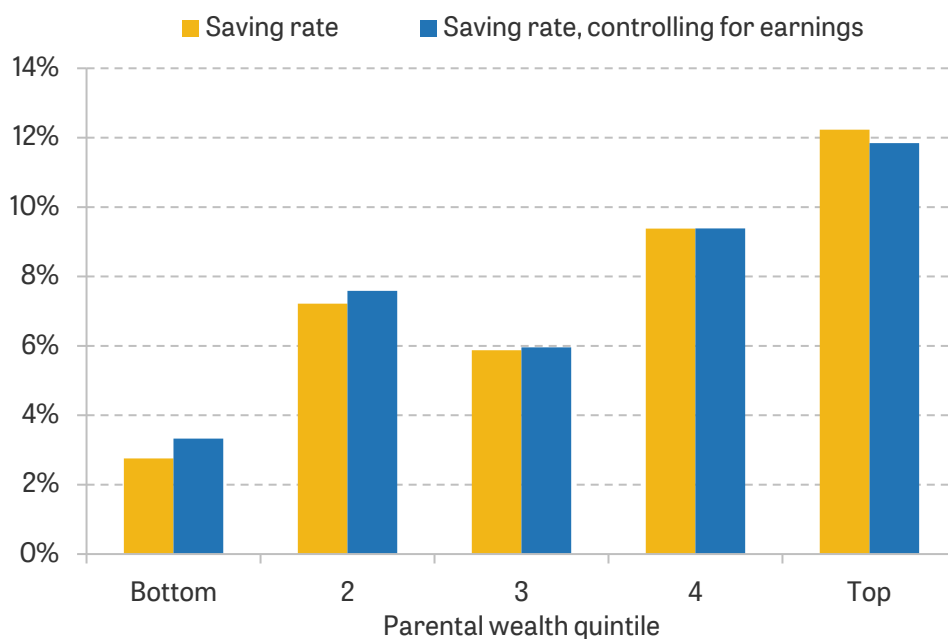
wealth). There is therefore strong evidence that the persistence of wealth is not simply driven by the persistence of earnings.

The findings that the persistence of earnings does not fully explain the persistence of wealth across generations raise the following questions: What does explain the additional persistence of wealth, compared to earnings? Is this additional persistence of wealth indicative of a role for unearned income in driving lifetime income persistence? Alternatively, is the additional persistence of wealth attributable to persistence in saving rates across generations? Again, no data exists that can give a comprehensive answer to these questions, but there is some evidence that goes some way to answering them. We now consider, in turn, the evidence on the role of saving rates, returns to wealth, and intergenerational transfers.

### **Is intergenerational wealth persistence driven by saving rates?**

Davenport et al. (2021) examine differences in saving rates by parental wealth level, using the BHPS/USoc sample described above. Figure 9 reproduces their findings. While the measure of saving used is based on self-reports of active saving and is therefore likely to miss some saving, such as that through mortgage principal repayments or passive saving of capital gains, it nevertheless strongly suggests that those with wealthier parents save a higher fraction of their earnings. Davenport et al. (2021) also show that this is true even when comparing those individuals with similar levels of earnings and so this finding is not simply driven by the fact that wealthy parents tend to have higher earning children and that higher earners tend to save at a higher rate. Furthermore, the higher saving rates of children with wealthy parents does not appear to be explained by their parents having higher saving rates (and perhaps passing on this behaviour implicitly or explicitly).

**Figure 9: Average active saving as a proportion of average earnings, by parental wealth quintile for those born 1974 to 1986 in the UK**



Source: Davenport et al. (2021)

Black et al. (2020) use Swedish administrative data to estimate the association between children's savings rates and the wealth and savings rates of their parents. In contrast to the findings of Davenport et al. (2021) for the UK, they find a slightly negative association between parental wealth and a child's savings rate. The authors interpret this as suggesting that children of wealthy parents save slightly less, all else equal, perhaps because they anticipate receiving wealth transfers in future.

This evidence suggests that in the Swedish setting, the persistence of wealth is not driven by saving behaviour, but that in the UK a substantial amount of wealth persistence could be driven by the children of wealthy parents saving more. That is significant because to the extent that intergenerational persistence of wealth is driven by savings behaviour, this means that it is not evidence of intergenerational persistence in lifetime income.

### **Is intergenerational wealth persistence driven by persistence in rates of return?**

Black et al. (2020) examine the association between portfolio allocation and returns to wealth and the wealth, savings rates, portfolio allocation and returns of their parents. They also use adopted children to assess whether intergenerational relationships are stronger between children and their biological or adopted parents, suggesting, respectively, roles for genes or innate ability and preferences, versus environmental factors. They find that those with wealthier parents hold a higher share of their wealth as risky financial assets and as real estate, and a lower share as safe assets. They also estimate that those with wealthier parents gain a higher return on their wealth. They also find that, among adoptees, the intergenerational persistence of investment decisions and returns are generally stronger between a child and their adopted parents

---

than with their biological parents. This suggests that it is the environment of upbringing that drives the transmission of these outcomes, rather than heritable traits. Together, child earnings, savings rates, and rate of return are found to explain, in a statistical sense, 50% of the persistence in wealth across generations.

Evidence on the intergenerational correlation in returns to wealth from Norwegian administrative data (Fagereng et al., 2020) suggests a positive but relatively modest intergenerational elasticity in returns of 0.16. This persistence is not itself driven only by the fact that wealthy people tend to get higher returns and that there is persistence of wealth across generations. Even when conditioning on wealth, there is persistence in returns across generations. In line with this, Benhabib et al. (2019) finds that modest intergenerational correlation of returns to wealth are consistent with patterns in US wealth inequality and wealth mobility.

In the UK, Davenport et al. (2021) finds that those with wealthier parents are more likely to hold riskier, potentially higher-return assets such as stocks and shares and housing wealth. The propensity of those with wealthier parents to hold riskier assets is largely explained by the higher earnings of those with wealthier parents. In the case of housing, however, there were significant gaps in the homeownership rate between those with wealthier and poorer parents, even after controlling for earnings. In so far as holding wealth as housing yields higher returns than the alternative use of that wealth, this could be a driver of wealth persistence. The idea that those with wealthy parents are able to get onto the housing ladder more easily and that this is to their financial advantage is prevalent in popular debates. New research quantifying the importance of this channel in driving intergenerational wealth persistence the UK would be valuable.

### Is intergenerational wealth persistence driven by intergenerational financial transfers?

Other than earnings, the factor that existing literature finds is most important in driving the intergenerational persistence of wealth is intergenerational financial transfers. Given that their source is the previous generation of a family, it is perhaps not surprising that this source of income could play a substantial role in driving lifetime income and wealth persistence.

Two studies estimating intergenerational wealth mobility in Denmark and Sweden made direct estimates of the role of inheritances in driving the persistence in wealth.

Examining a group of Danish individuals over the period where their final living parent died, Boserup et al. (2017) found that the intergenerational rank correlation in wealth among this group increased from 0.27 to 0.37, a rise of over a third. This compared with an otherwise similar group whose parents did not die and who saw no change in this measure of wealth persistence. The interpretation given is that this increase in wealth persistence at the time when parents die shows the impact of inheritances on the persistence of wealth. In Sweden, by calculating measures of wealth with and without

the addition of inherited wealth, Adermon et al. (2018) found that around one half of the intergenerational rank correlation in wealth could be explained by inheritances.

Boserup et al. (2017) also document that wealth persistence follows a U-shape in the child's age, being high when they enter adulthood, falling when the child is in their early 20s, and then rising again through the late 20s and 30s, before stabilising from around age 40. The interpretation of this finding is that inter-vivos transfers from wealthy parents play a significant role in driving wealth persistence in early adulthood, before children have built up any significant wealth from their own earnings.<sup>11</sup>

These two studies therefore find that intergenerational wealth transfers explain a large share of the persistence in wealth that is not explained by the persistence in earnings. In turn, this is strongly suggestive of intergenerational transfers playing an important role in increasing the persistence of lifetime income. However, these findings alone cannot *quantify* the role of inheritances in increasing lifetime income persistence. The increase in the persistence of wealth attributable to inheritances could be different in size to the increase in the persistence in lifetime income attributable to inheritances. This is because wealth at any point in life represents only a fraction of lifetime income, depending on how much of income is saved, when it is saved, and the return to those savings. Unless we make further assumptions about the relationship between wealth and lifetime income, we cannot directly infer the impact of inheritances on the persistence of lifetime income from its impact of the persistence of wealth. But this evidence does suggest that wealth transfers look likely to be an important driver of lifetime income persistence.

For the UK, there has not been any direct quantification of the importance of intergenerational transfers in driving wealth or lifetime income persistence. Clark and Cummings (2015) used rare surnames in England and Wales to measure persistence in wealth at death over five generations (wealth at death being a close proxy for the intergenerational transfer of wealth through inheritance). They estimate higher intergenerational elasticities in wealth at death than are typically estimated for earnings. Clark and Cummings' preferred estimates of 0.70-0.75 compare to elasticities of male earnings of around 0.3. This strongly suggests that inheritances increase overall lifetime income persistence, though these results cannot tell us *how much* of lifetime income persistence is driven by inheritances. However, we note that, given these estimates are of the persistence of bequests for those who died, at latest, in 2012, they may not be representative of the importance of inheritances for those in younger generations today. Furthermore, the paper has wealth data only for the minority of

---

<sup>11</sup> This is counteracted when children are in their early 20s and those with wealthy parents earn and save less than their peers with poorer parents (as the former are more likely to be in education in their early 20s, for example). But as working life goes on, the intergenerational persistence of earnings is established and drives an increase in the persistence in wealth.



---

people whose estate was required to be probated so persistence of wealth transfers may be different over the whole population.

We now turn to our main focus when considering the role unearned incomes in social mobility in the UK today: intergenerational transfers of wealth i.e. inheritances and *inter-vivos* transfers.. We first document the size of inter-vivos transfers in the UK and their relationship with markers of parental lifetime income and with receivers' earned income. In section 8, we combine information from multiple datasets to make a simulation and estimate the contribution of inheritances to lifetime income persistence for today's working-age generations in the UK.

### Intergenerational wealth transfers in the UK

To set the scene, Figure 10 shows the proportion of individuals in each age-group who receive substantial intergenerational transfers over a 2-year period. This data is from the Wealth and Assets Survey (WAS), which covers Great Britain over the period 2006 to 2016. Here, we split transfers into inheritances, gifts, and loans.<sup>12</sup> Individuals are asked about whether they have received an inheritance of £1000 or more in the past 2 years. For gifts and loans, the threshold amount is £500. In the case of inheritances, we exclude those transfers that are not intergenerational because they are reported to be received from a spouse, sibling, or non-relative.<sup>13</sup>

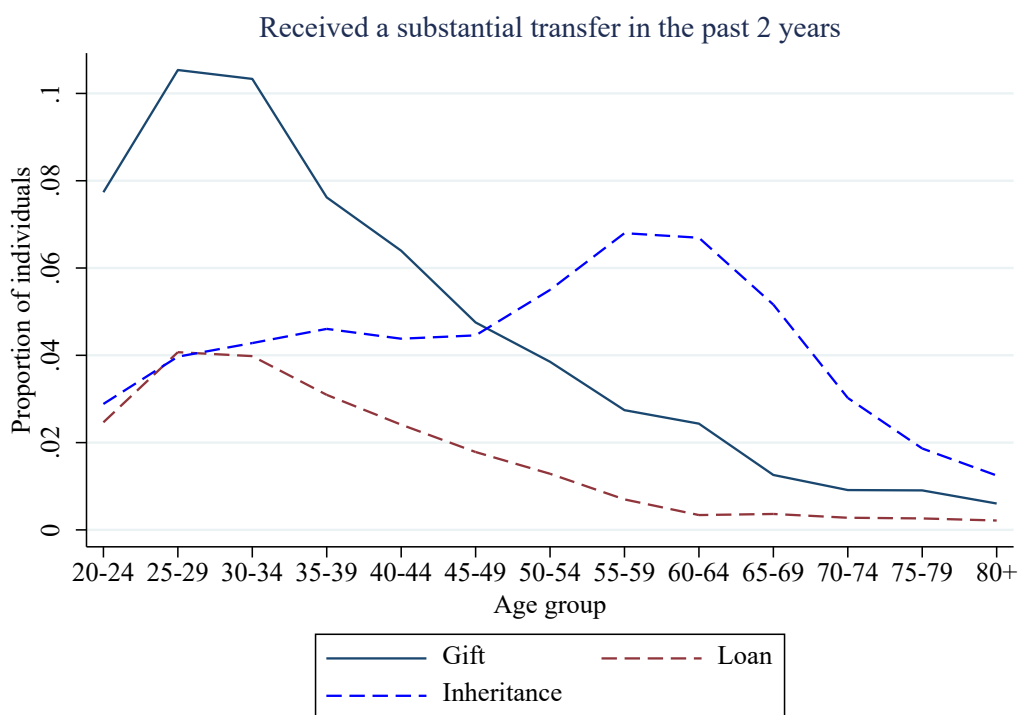
Figure 10 shows that gifts are most commonly received by those in their 20s and 30s with just over 1 in 10 people aged 25-34 receiving a gift in a two-year period. Loans are less frequently received but also most common amongst those in early adulthood. Around 4% of individuals aged 25-49 receive an inheritance in any two-year period, but this rises to 7% of those in their late 50s and early 60s before falling again with age. This timing is in line with the age that people tend to be when their parents die.

---

<sup>12</sup> While loans would not ordinarily be considered a financial transfer, if they are made on favourable terms, or are partially written off then they may be conceived as such. Further, a loan that is fully repaid could lead to higher income of the recipient if, for example, it enables them to develop a business, for example. As discussed below, these transfers could therefore be relevant to social mobility due to their effects on other income.

<sup>13</sup> The survey asks about gifts and loans from 'friends and family' but there is no further information collected on who gifts and loans were received from. Evidence from other sources suggests that the vast majority of the gifts received at younger ages are intergenerational transfers from older generations of family. See for example Dolton et al. (2019). While it is relatively less common to receive gifts at older ages, these are much more likely to be transfers from others in the same generation or from children or grandchildren.

**Figure 10 :The proportion of individuals receiving a gift, loan or inheritance over a 2-year period, by age-group**



Source: Wealth and Assets Survey waves 1 to 5, 2006 to 16

Despite their prevalence, gifts and loans are much smaller in size than inheritances. The mean value of inheritances amongst receivers rises from around £25,000 for those in their 20s to £60,000 for those in their 60s. Gifts and loans received have an average value of around £5000 at all ages. The distribution of all transfers is highly skewed, with many relatively small transfers and a small number of very large transfers.

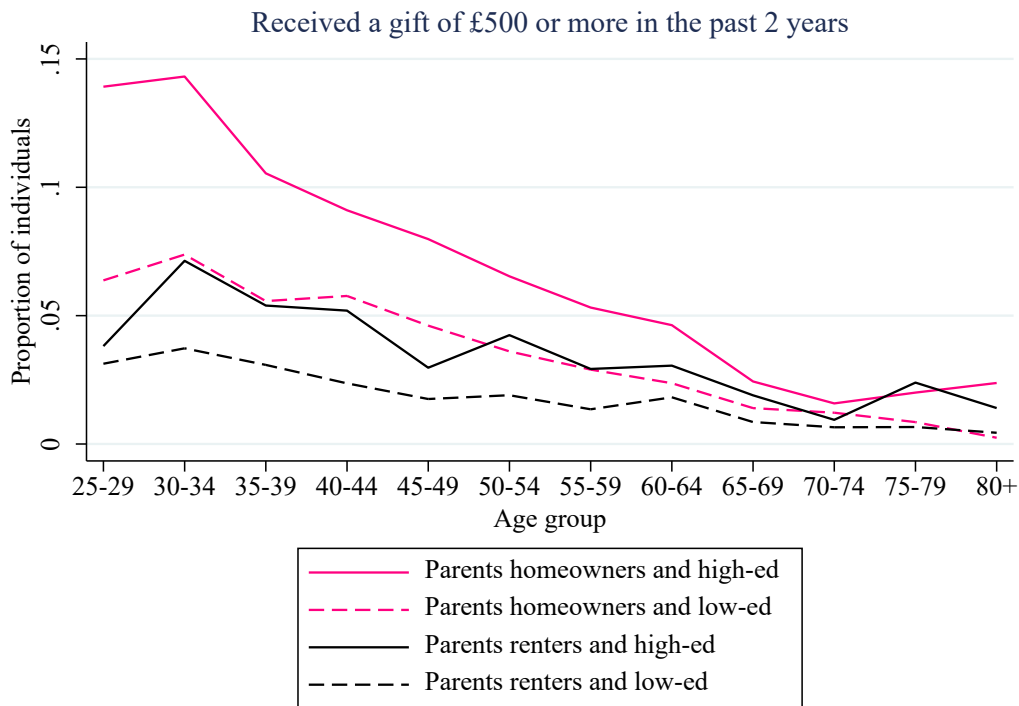
**The association of inter-vivos transfers with markers of parental wealth and child earned income**

Inter-vivos transfers or lifetime gifts are a relatively small part of total intergenerational wealth transfers and therefore their direct impact on lifetime income mobility is likely to be relatively modest. However, they might have important indirect effects on lifetime income if they interact with labour market choices or investment decisions.

We draw upon the Wealth and Assets Survey which contains information on financial transfers received for a representative sample of the British population. The survey also asks respondents to recall their mother and their father’s highest level of education achieved and their household’s housing tenure when they (the respondent) were a teenager. We use this information to categorise individuals into two groups by parental education: those with at least one parent who remained in education beyond age 16 and those for whom both parents finished education at age 16 or younger. We create two

housing tenure groups: those who lived in a household that owned their own home when they were a teenager and those who lived in rented accommodation. We treat the housing tenure when the respondent was younger as their parents housing tenure. Figure 11 shows that gifts are much more common and larger amongst those whose parents were homeowners and have higher levels of education. These two variables are strong predictors of parental wealth, therefore these transfers have the potential to play a role in transmitting economic status across generations, directly and indirectly.

**Figure 11: Proportion of individuals who report receiving a gift of £500 or more in the past 2 years, by age-group and parents' housing tenure-and-education-group**

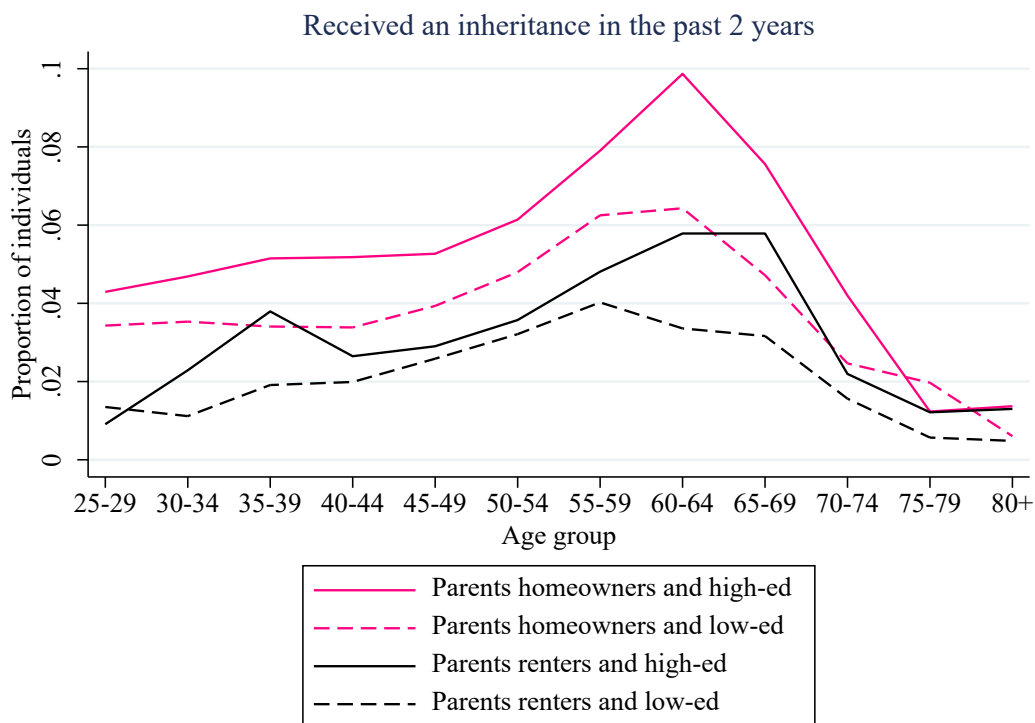


Source: Author's calculations using the Wealth and Assets Survey, waves 1 to 5.

### The association of inheritances with markers of parental wealth and child earned income

For those who have inherited in recent years in the UK, we show evidence of their association with markers of parental wealth and child earnings. First, perhaps unsurprisingly, inheritances are more commonly received and are larger for those whose parents have characteristics associated with high wealth and earned income. Figure 12 shows the proportion of individuals receiving an inheritance over a 2-year period, again split into 4 groups based on the individual's parents' level of education and housing tenure.

**Figure 12: Proportion of individuals receiving an inheritance, by parents' housing tenure and education level**

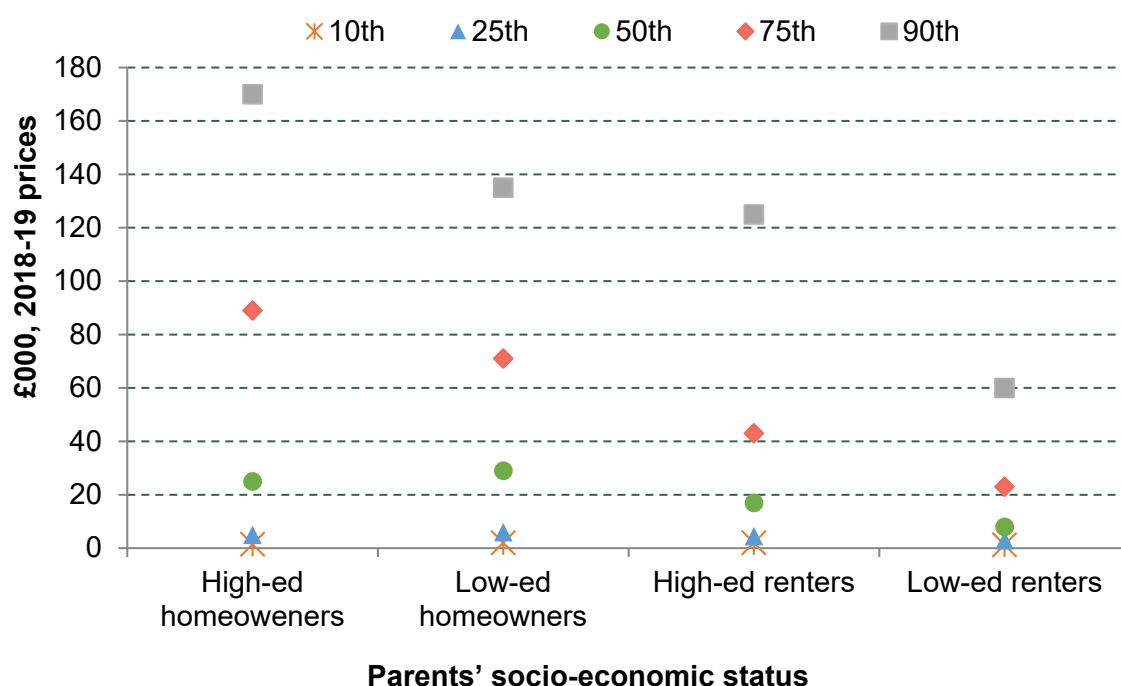


Source: Wealth and Assets Survey waves 1 to 5.

Figure 9 shows that having highly-educated parents or parents who are homeowners is associated with a higher probability of receiving an inheritance. For example, those with high-educated homeownership parents are around twice as likely to receive an inheritance at any given age than those whose parents are low-educated and renters. Figure 13 shows, amongst those who do receive an inheritance, selected points of the distribution of inheritances, demonstrating that inheritances differ in size between these groups. For example, while half of inheritors with high-educated homeownership parents inherited £29,000 or more, fewer than one in four inheritors with low-educated renting parents received as sum this large (the 75<sup>th</sup> percentile of inheritances for this group being

£23,000). Education and homeownership are positively associated with lifetime income and wealth and so these patterns are highly likely to mean that those with parents with higher lifetime income inherit substantially larger sums and so inheritances act to increase the intergenerational persistence of incomes.

**Figure 13: Selected points of the distribution of inheritances, amongst those receiving an inheritance, by parents' housing tenure and education level**

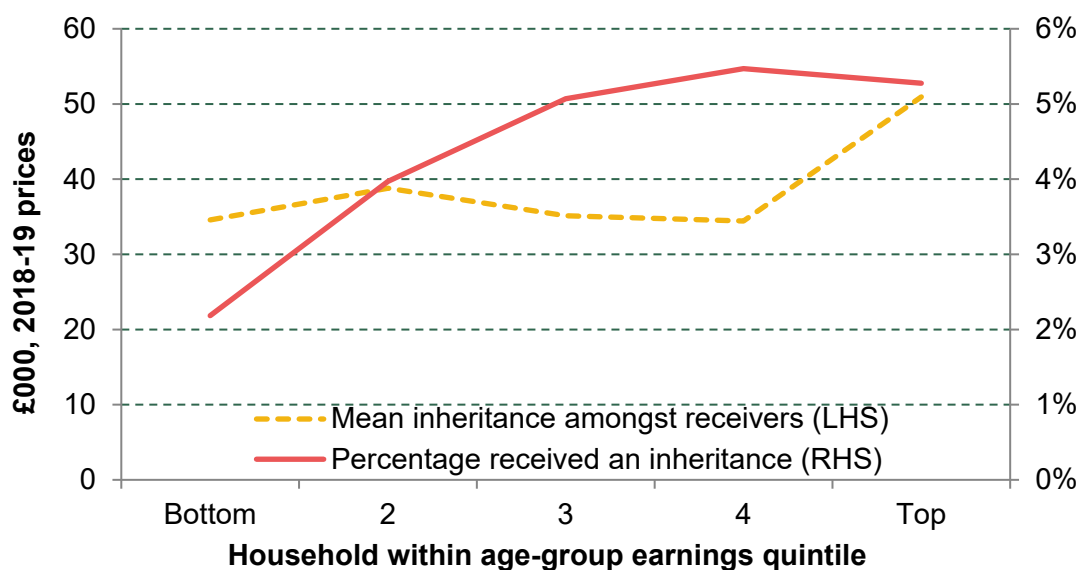


Source: Wealth and Assets Survey waves 1 to 3.

As noted earlier, the effect of inherited wealth on overall income mobility will be stronger if there is a close relationship between inheritances and earned income. The evidence here shows that these two income streams are positively related. Figure 14 shows the proportion of individuals who receive an inheritance and the mean inheritance amongst

receivers, by quintile of earnings. Higher earners are more likely to inherit and to inherit larger sums.

**Figure 14: Proportion inheriting and mean size of inheritance amongst receivers, by quintile of household earnings**



Note: Earnings quintiles are defined within 5-year age-groups.

Source: Wealth and Assets Survey, waves 1 to 5, 2006 to 2016.

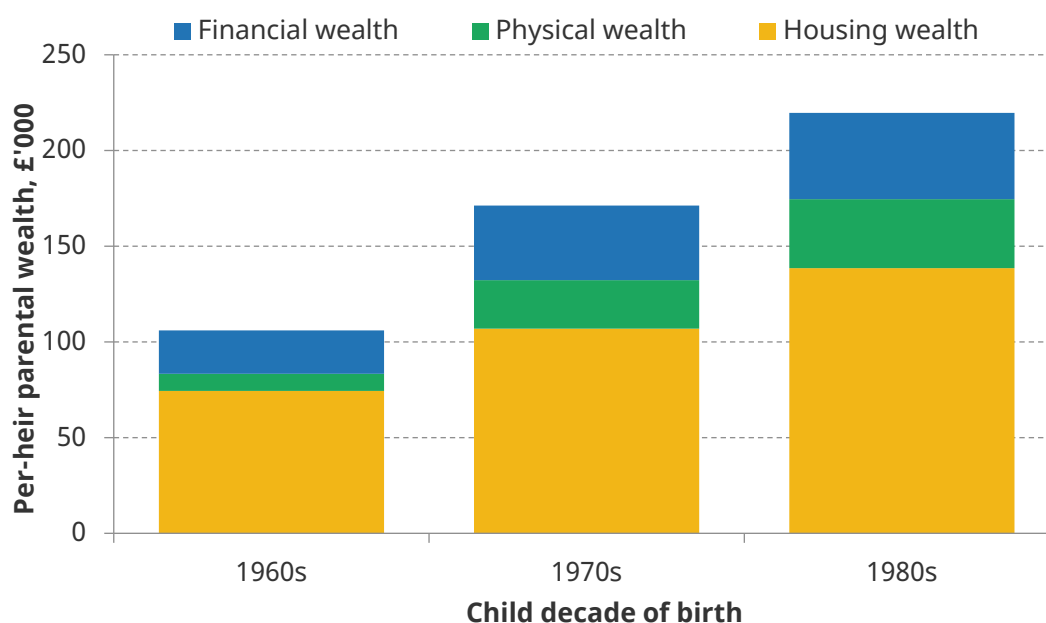
### The contribution of inherited wealth to lifetime income mobility

While we were able to give some indicative evidence on the impact to date of inherited wealth on lifetime income mobility in the UK, in the absence of data linking generations and covering all of lifetime income, we are unable to quantify their contribution. In part for this reason, we turn to look at younger generations. In these generations, most people have living parents and most inheritances have not yet been received. This means that we can use data that links generations of those alive today to try to estimate future trends in inheritances and their potential impact on social mobility. Independent of these data issues, there is reason to look towards the future both because inheritances look set to be larger part of lifetime income for younger generations and because we may be more interested in trends in future inheritances where policy is more likely to be able to have an impact.

Several recent studies document that inheritances have been becoming more prevalent over time and larger as a share of national income (Atkinson 2014, Hood & Joyce, 2017). Based on patterns in parental wealth holding and earnings of future heirs, inheritances look set to increase in size, compared to lifetime earnings, for those born in the 1960s, 1970s and 1980s. This is driven by several key trends: the increasing levels of wealth held

by older generations (due to the large house price increases and shift of wealth from public to private ownership that took place in the 1980s to early 2000s), the slowing of earnings growth that has happened since the mid-2000s, and the declining number of children per person (Bourquin et al., 2020). Figure 10 shows that the parents of the those born in the 1980s hold about twice as much wealth (adjusting for age) as the parents of those born in the 1960s.

**Figure 15: 'Per-heir' parental wealth, by 'child' decade of birth**



Note: Wealth is adjusted to age-65-equivalent terms by using the estimated (within cohort) growth in wealth with age.

Source: Bourquin et al. (2020)

Recent work in Bourquin et al. (2021) has made projections of inheritances that will be received by those born in the 1960s, 1970s and 1980s and their distribution across the distribution of household lifetime income. These estimates are made by projecting forwards trends in parental wealth and household earnings and using the relationship between parental wealth and child earnings estimated using the BHPS/USoc intergenerational linkage described in Section 2.2. Whereas inherited wealth is projected to be worth 9% of lifetime income for those born in the 1960s, this rises to 16% for those born in the 1980s, a dramatic rise in the importance of inherited wealth.<sup>14</sup> Unsurprisingly, those with higher levels of parental wealth are set to receive larger inheritances, compared to their lifetime income, meaning that inheritances increase inequalities by parental background. Treating parental position in the wealth distribution at older ages as a proxy for their position in the lifetime income distribution, this implies

<sup>14</sup> See Bourquin et al. (2021) for details of the methodology used to make these projections.

that inheritances are set to strengthen the link between parents and children's lifetime income i.e. to decrease lifetime income mobility.<sup>15</sup>

With these projections, we can explicitly quantify the projected contribution of inheritances to lifetime income mobility for the first time. We do this by simulating the change in the “rank-rank slope” attributable to inheritances. More precisely, taking the simulations of Bouquin et al. (2021), we assign households to percentile ranks according to their lifetime income within their generation and assign their parents similarly, based on their wealth when in their 50s. In doing this, we take parents' wealth rank as a proxy for their lifetime income rank. We estimate a regression of child's household income rank on parents' wealth rank. We do this both including and excluding inheritances from the child's household lifetime income. The comparison of the two estimated coefficients tells us how much inheritances are projected to decrease lifetime income mobility. We estimate a “rank-rank slope” of 0.39 for the 1960s generation when inheritances are excluded. This rises to 0.46 with the inclusion of inheritances, a rise of 19%.<sup>16</sup> For those born in the 1980s, inheritances increase the “rank-rank slope” from 0.39 to 0.49, a rise of 26%. The projected effect of inheritances on social mobility is therefore almost a third larger for the 1980s generation than the 1960s generation. We conclude therefore that the rising size of wealth is likely to mean that inherited wealth becomes a larger share of lifetime income for younger generations and that, consequently, lifetime income mobility is set to fall across generations.

---

<sup>15</sup> In so far as inheritances are a transfer of housing which has appreciated in price over time without providing a commensurately higher flow of housing consumption, this would mean that inheritances do not increase lifetime consumption as much as they increase wealth, if housing wealth that is inherited is not sold or is used to buy other housing. Indeed, it has been argued that much – or even all – of the growth in UK house prices over the past 40 years is attributable to the decline in returns on safe assets, which has increased demand for housing, as opposed to rising rental values (Miles and Monro, 2021). However, Bourquin et al. (2021) finds that 19% of those receiving an inheritance in WAS report inheriting property wealth (88% of those who inherit report inheriting money or savings). Therefore, the bulk of inheritances are either not in the form of housing, or, if they are, housing wealth is liquidated when inherited. Nevertheless, even if recent house price growth has been in excess of the growth of the flow of housing consumption, the real-terms increase in wealth would increase consumption possibilities and clearly does so differentially according to the amount inherited.

<sup>16</sup> Our estimates of the rank-rank slope measure of income mobility are higher than those set out in section 2. The income estimates of section 2 do not capture intergenerational transfers and so are most comparable to our simulations of lifetime income excluding inheritances. There are still differences between these two measures as we here simulate household income, whereas in section 2 we examine individual earnings. Therefore a positive relationship between parental wealth and the probability of having a partner and with a partner's earnings (as feed into our simulations) could drive this additional persistence of income rank. There are likely to also be differences due to our use of parental wealth rank to proxy for parental lifetime income rank and the fact that our measure of income in section 2 is from early adulthood, rather than being a measure of lifetime income rank.



---

## References

- Becker, Gary, and Nigel Tomes. 1986. "Human Capital and the Rise and Fall of Families." *Journal of Labor Economics* 4(3):S1–S39.
- Black, S. E., & Devereux, P. J. (2011). Recent Developments in Intergenerational Mobility. *Handbook of Labor Economics*, 4, 1487-1541.
- Blanden, J. (2013). Cross-country rankings in intergenerational mobility: a comparison of approaches from economics and sociology. *Journal of Economic Surveys*, 27(1), 38-73.
- Blanden J, Gibbons S (2006) The persistence of poverty across generation: a view from two British cohorts, Joseph Rowntree Foundation,  
<https://www.jrf.org.uk/sites/default/files/jrf/migrated/files/9781861348531.pdf>
- Blanden J, Goodman A, Gregg P, Machin S (2004) Changes in intergenerational mobility in Britain. In: Corak M (ed) *Generational income mobility in North America and Europe*. Cambridge University Press, Cambridge, pp 122–146
- Blanden J, Gregg P, Macmillan L (2007) Accounting for intergenerational income persistence: noncognitive skills, ability and education. *Econ J* 117:C43–C60
- Blanden, Jo, Paul Gregg, and Lindsey Macmillan 2013. "Intergenerational persistence in income and social class: The impact of within-group inequality." *Journal of the Royal Statistical Society, Series A*, 176: 541–563. <http://dx.doi.org/10.1111/j.1467-985X.2012.01053.x>.
- Blanden, J. S. Machin S. Rahman (2021) *Absolute Intergenerational Mobility and the Labour Market*, Mimeo.
- Blanden, J., & Macmillan, L. (2016). Educational inequality, educational expansion and intergenerational mobility. *Journal of Social Policy*, 45(4), 589-614.
- Blau, Peter, and Otis Duncan. 1967. *The American Occupational Structure*. New York: Wiley.
- Böhlmark, A. and Lindquist, M. (2006). 'Life-cycle variations in the association between current and lifetime income: replication and extension for Sweden', *Journal of Labor Economics*, Vol. 24, pp. 879– 896.
- Breen, R., Mood, C., & Jonsson, J. O. (2016). How much scope for a mobility paradox? The relationship between social and income mobility in Sweden. *Sociological Science*, 3, 39.
- Bukodi, E., and Goldthorpe, J. H. (2018) *Social Mobility and Education in Britain: Research, Politics and Policy*, Cambridge: Cambridge University Press
- Bukodi, E., Goldthorpe, J. H., Waller, L., and Kuha, J. (2015) 'The mobility problem in Britain: new findings from the analysis of birth cohort data', *The British Journal of Sociology*, 66 (1): 93-117
- Chadwick, L. and Solon, G. (2002) 'Intergenerational Mobility Among Daughters.' *American Economic Review*, 92, pp.335-344.

- Chetty, R. Hendren, N. Kline, P. Saez, E. and Turner, N. (2014a) 'Is the United States still a land of opportunity? Recent trends in intergenerational mobility'. *American Economic Review: Papers and Proceedings* Vol 104 (5) pp.141-147.
- Chetty, R. Hendren, N. Kline, P. Saez, E. and Turner, N. (2014b) 'Where is the Land of Opportunity? The Geography of Intergenerational Mobility in the United States'. *The Quarterly Journal of Economics* Vol 129 (4) pp.1553-1623.
- Carneiro, P., S. Cattan, L. Dearden, L. van der Erve, S. Krutikova, L. Macmillan (2020) "The long shadow of deprivation: Differences in opportunities across England" *Social Mobility Commission Research Report* September, 2020.
- Carneiro, P., S. Cattan, L. Dearden, L. van der Erve, S. Krutikova, L. Macmillan (2022) "Intergenerational income mobility in England and the importance of education" *IFS Working Paper W22/23*
- Chevalier, Arnaud, Kevin Denny, and Dorren McMahon (2009), "A Multi-country study of inter-generational educational mobility" in: Peter Dolton, Rita Asplundh and Erling Barth, eds., *Education and inequality Across Europe* (Edward Elgar, London).
- Corak, M 2013. "Income Equality, Equality of Opportunity, and Intergenerational Mobility." *Journal of Economic Perspectives* 27(3):79-102.
- Dahl, G. B., Kostøl, A. R., & Mogstad, M. (2014). Family welfare cultures. *The Quarterly Journal of Economics*, 129(4), 1711-1752.
- Dearden, L., Machin, S., and Reed, H. (1997)"Intergenerational mobility in Britain" in *The Economic Journal*, 107, pp.47-66
- Duncan, Otis, and Robert Hodge. 1963. "Education and Occupational Mobility: A Regression Analysis." *American Journal of Sociology* 68(6):629-44.
- Erikson, R. and Goldthorpe, J. H. (2011), Has social mobility in Britain decreased? Reconciling divergent findings on income and class mobility. *British Journal of Sociology*, 61, 2, 211-230
- Erikson, R. and Goldthorpe, J. H. (1992) *The Constant Flux—a Study of Class Mobility in Industrial Societies*. Oxford: Clarendon.
- Goldthorpe, J. H. and Jackson, M. (2007) Intergenerational class mobility in contemporary Britain: political concerns and empirical findings. *Br. J. Sociol.*, **58**, 525-546.
- Gottschalk, P. (1996). Is the correlation in welfare participation across generations spurious?. *Journal of Public Economics*, 63(1), 1-25.
- Grawe, N. D. (2006). 'Lifecycle bias in estimates of intergenerational earnings persistence', *Labour Economics*, Vol. **13**, pp. 551- 570.
- Gregg, P., Jiang, Y., Macmillan, L., Shure, N., and Wyness, G., (2021) 'Accounting for intergenerational persistence in a new cohort: noncognitive skills, ability and education' mimeo.

---

Gregg, P., Macmillan, L. A., & Vittori, C. (2019). [Intergenerational income mobility: Access to top jobs, the low-pay no-pay cycle, and the role of education in a common framework](#). *Journal of Population Economics*. doi:10.1007/s00148-018-0722-z

Gregg, P., Macmillan, L. A., & Vittori, C. (2017). [Moving Towards Estimating Sons' Lifetime Intergenerational Economic Mobility in the UK](#). *Oxford Bulletin of Economics and Statistics*. doi:10.1111/obes.12146

Gregg, P. and Macmillan, L. (2020), [Intergenerational joblessness across Europe: the role of labour markets, education and welfare generosity](#), No 20-11, CEPEO Working Paper Series, Centre for Education Policy and Equalising Opportunities, UCL Institute of Education

Gregg, P. and Macmillan, L. (2010), Family income, education and cognitive ability in the next generation: exploring income gradients in education and test scores for current cohorts of youth, *Longitudinal and Life Course Studies*, 1, 3, 259–280.

Hachen, D. (1994). Book Reviews : Robert Erikson and John H. Goldthorpe: The Constant Flux. A Study of Class Mobility in Industrial Societies. Oxford: Clarendon Press, 1992. *Acta Sociologica*, 37(1), 110–113. <https://doi.org/10.1177/000169939403700110>

Haider, S. and Solon G. (2006). ' Life-cycle variation in the association between current and lifetime earnings', *American Economic Review*, Vol. **96**, pp. 1308– 1320.

Hertz, Tom, Tamara Jayasundera, Patrizio Piraino, Sibel Selcuk, Nicole Smith and Alina Verashchagina (2007), "The inheritance of educational inequality: International comparisons and fifty-year trends", *The B.E. Journal of Economic Analysis & Policy* 7, Article 10.

Jäntti, M. and Jenkins, S. (2013) 'Income Mobility.' *IZA Discussion Papers* 7730.

Jerrim, J., & Macmillan, L. (2015). Income inequality, intergenerational mobility, and the Great Gatsby Curve: Is education the key?. *Social Forces*, 94(2), 505-533.

Jenkins, S. (1987). ' Snapshots versus movies: "lifecycle biases" and the estimation of intergenerational earnings inheritance', *European Economic Review*, Vol. **31**, pp. 1149– 1158.

Levine, P. B., & Zimmerman, D. J. (1996). *The Intergenerational Correlation in AFDC Participation: Welfare Trap or Poverty Trap?* (pp. 1100-1196). University of Wisconsin-Madison, Institute for Research on Poverty.

McIntosh, S. (2006), Further Analysis of the Returns to Academic and Vocational Qualifications, *Oxford Bulletin of Economics and Statistics*, 68, 2, 225–251.

Macmillan, L. (2014). Intergenerational worklessness in the UK and the role of local labour markets. *Oxford Economic Papers*, 66(3), 871-889.

Nybohm, M., & Stuhler, J. (2017). Biases in standard measures of intergenerational income dependence. *Journal of Human Resources*, 52(3), 800-825.

Solon, G. (1992). Intergenerational income mobility in the United States. *The American Economic Review*, 393-408.

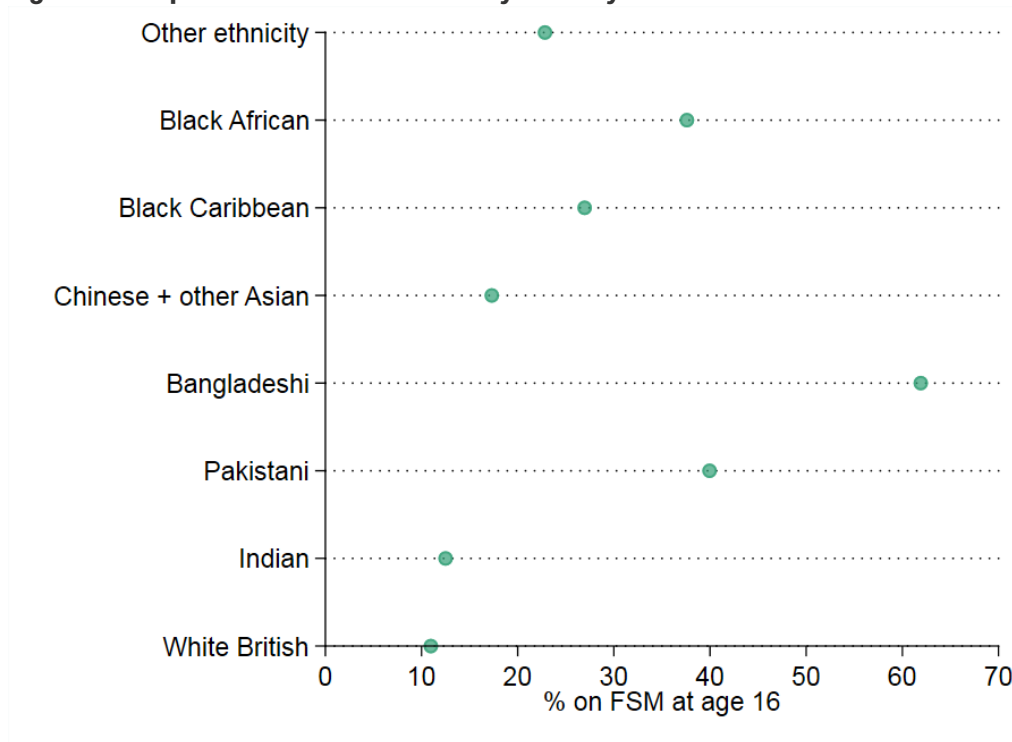
Solon, Gary. 2004. "A Model of Intergenerational Mobility Variation over Time and Place." In *Generational Income Mobility in North America and Europe*, edited by Corak, Miles, 38–47. Cambridge, UK: Cambridge University Press.

Zimmerman, D. J. (1992). Regression toward mediocrity in economic stature. *The American Economic Review*, 409-429.

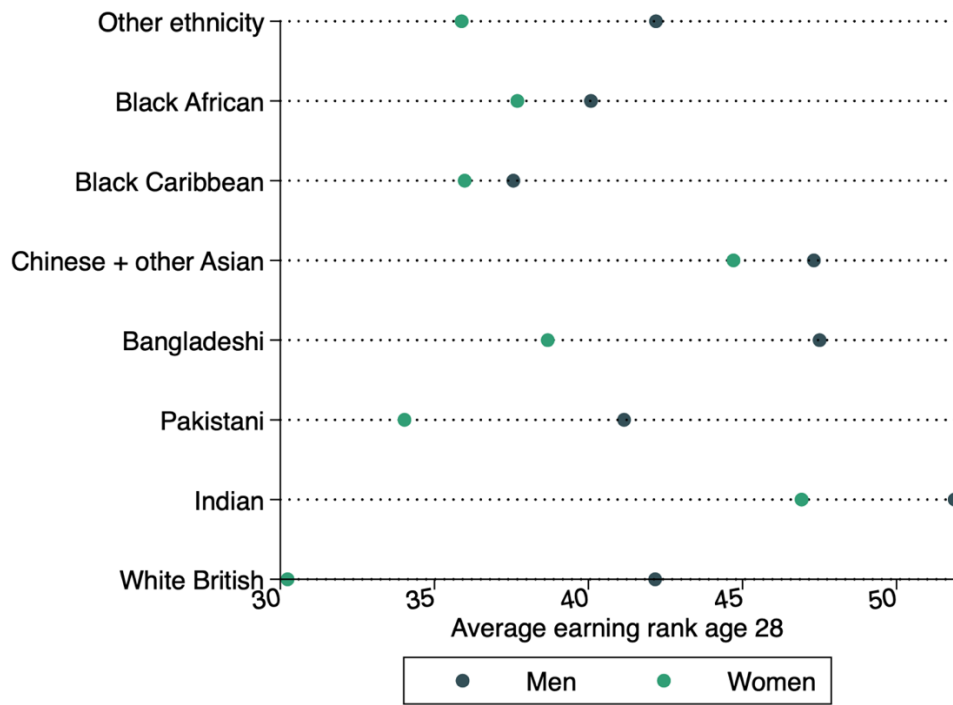
Zwysen, W. (2016). Crowding out of disadvantaged young adults in Germany: background matters depending on local labour market. *European Sociological Review*, 32(5), 662-674.

# Appendix 1: "Additional heterogeneity" analysis

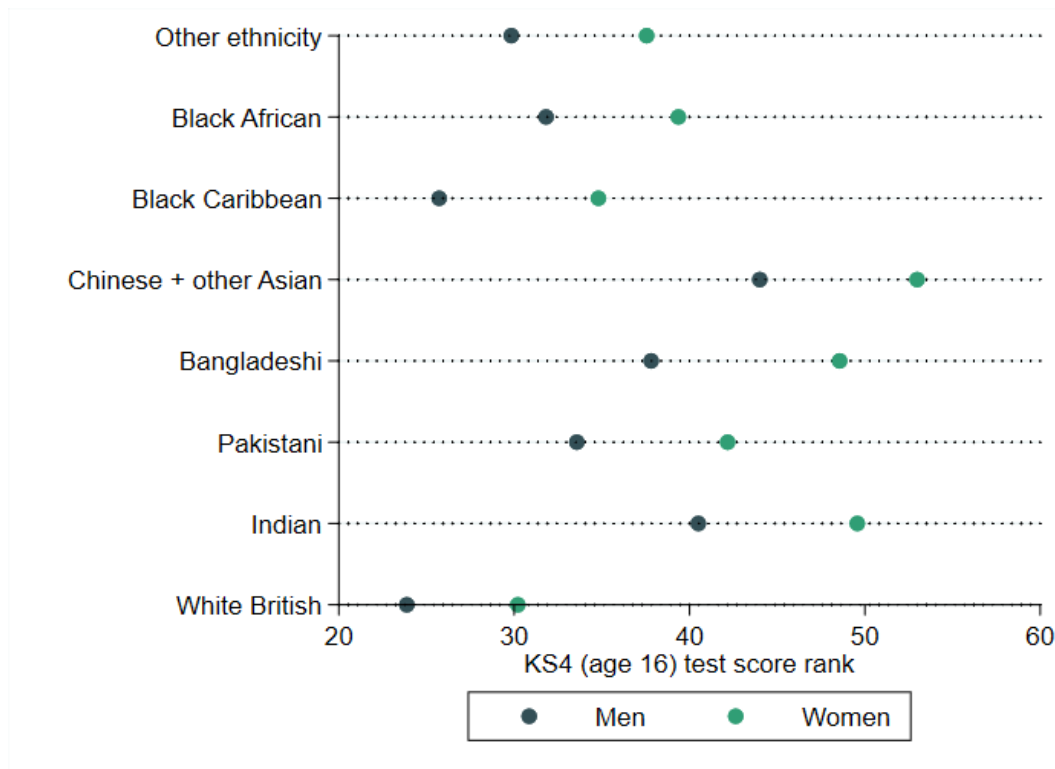
Figure A1: Proportion of children on FSM by ethnicity



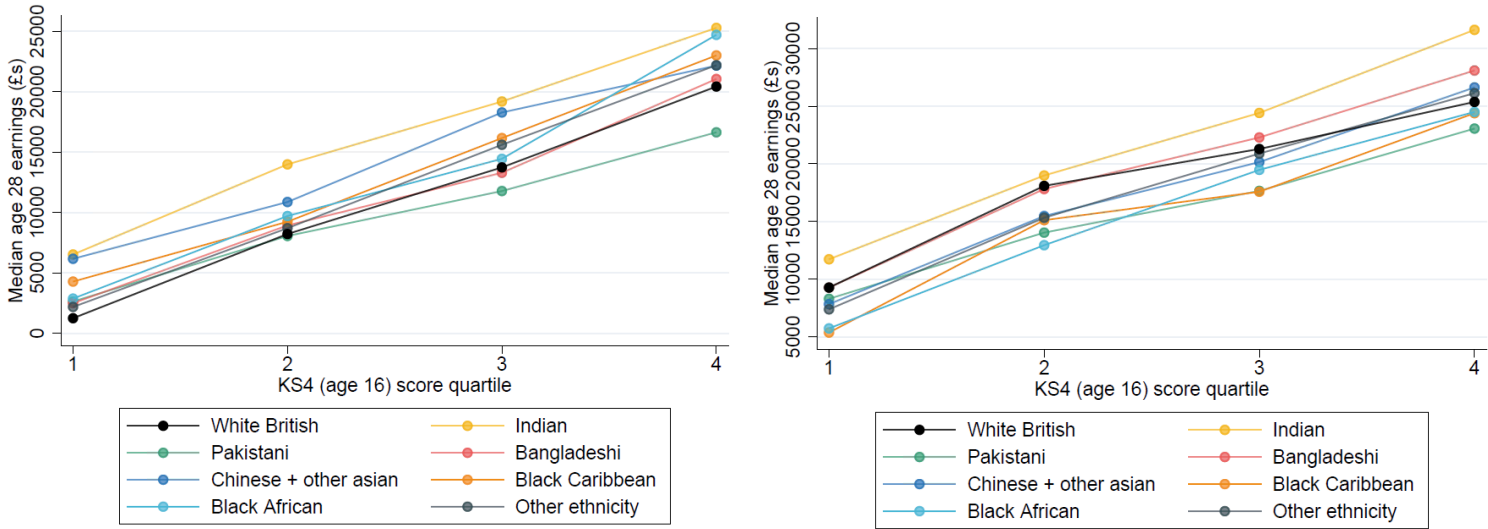
**Figure A2: Age 28 earnings rank for children eligible for FSM at age 16**



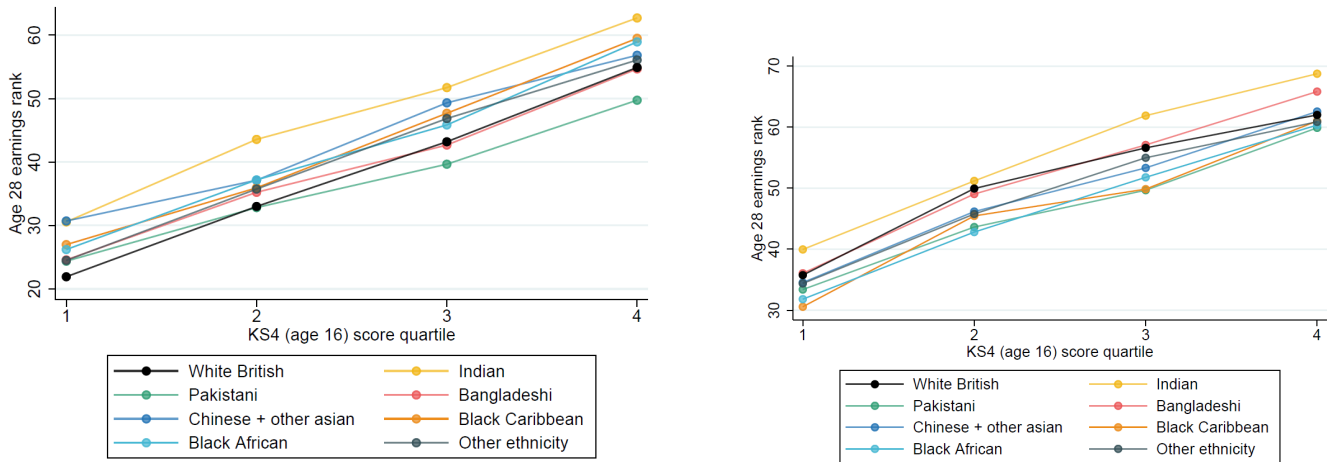
**Figure A3: Age 16 educational attainment by ethnicity and gender among children eligible for FSM at age 16**



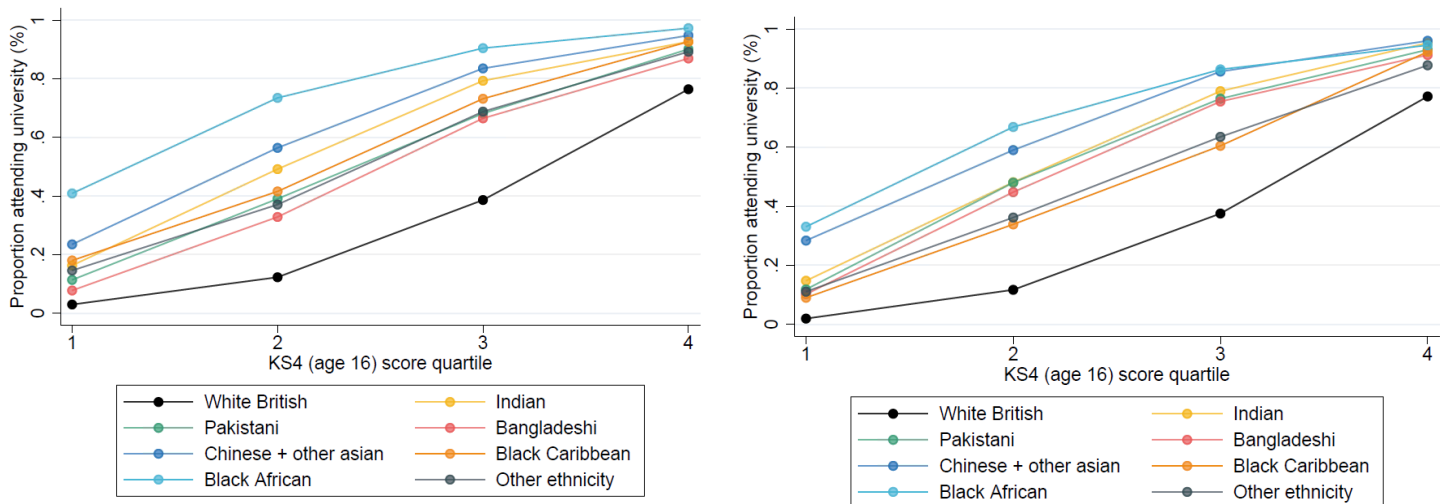
**Figure A4: Labour market median earnings at age 28 by education attainment at age 16 among individuals eligible for FSM at age 16 – women (left), men (right)**



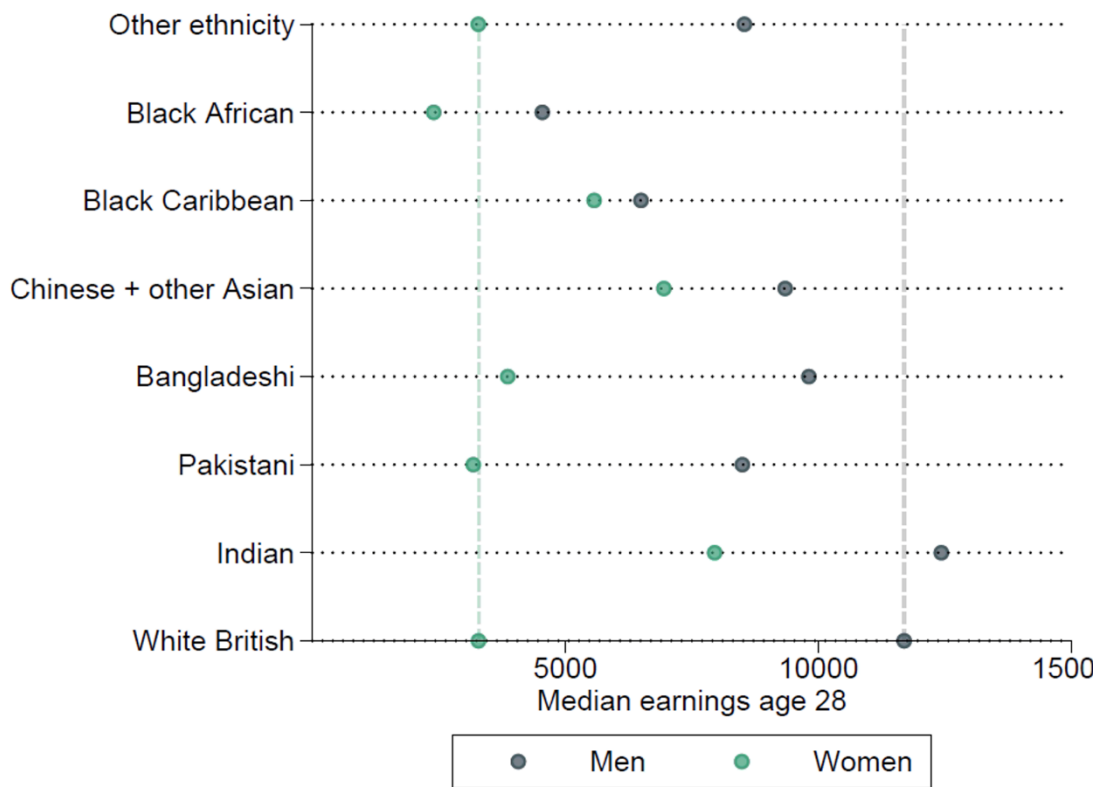
**Figure A5: Labour market earnings rank at age 28 by education attainment at age 16 among individuals eligible for FSM at age 16 – women (left), men (right)**



**Figure A6: Relationship KS4 attainment and university attendance (FSM children) – women (left) and men (right)**

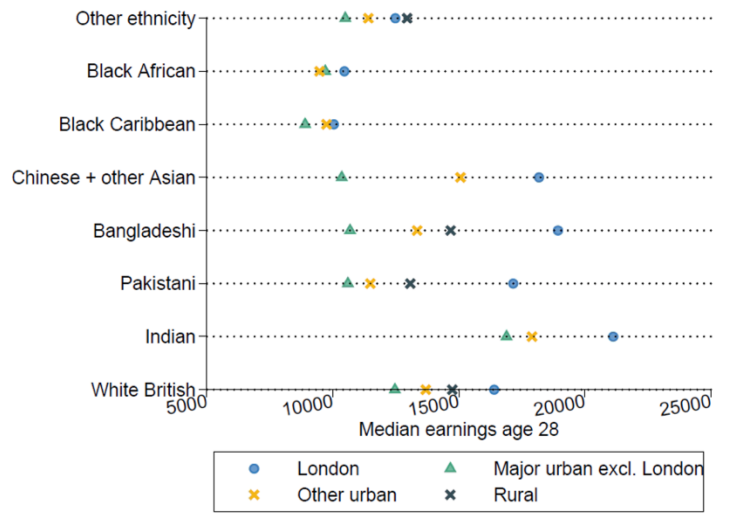
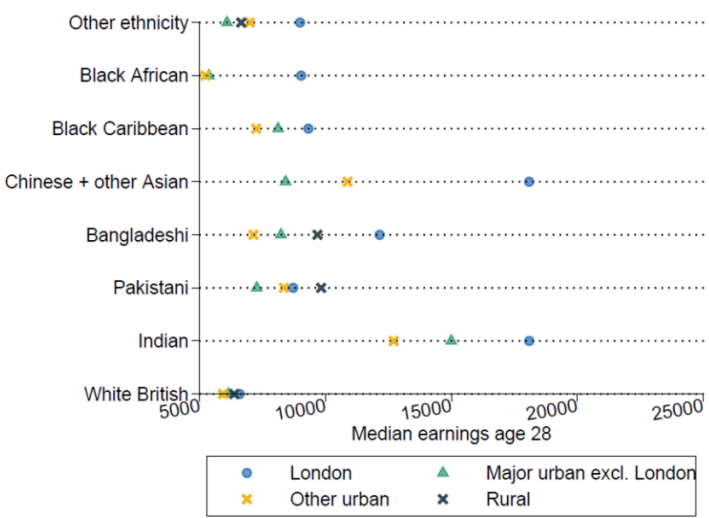


**Figure A7: Age 28 median earnings for children eligible for FSM at age 16 with low educational attainment**

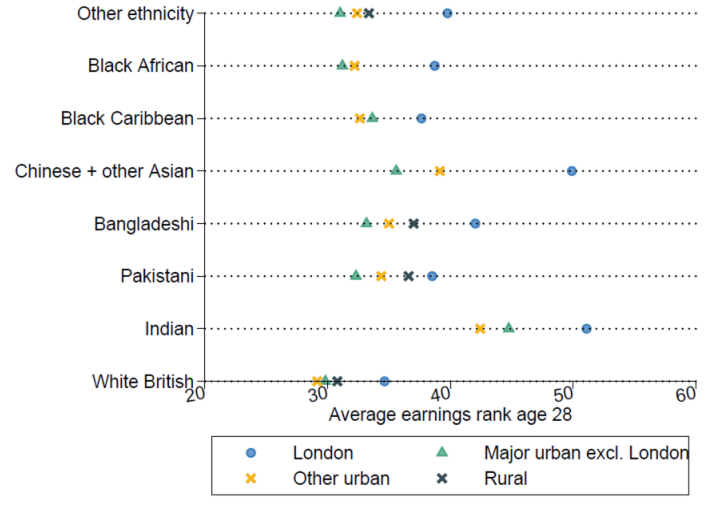
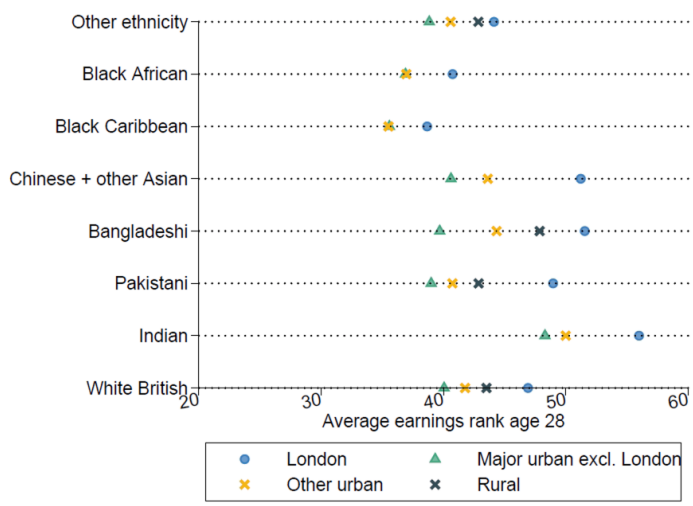




**Figure A6: Median earnings of children eligible for Free School Meals across ethnicity and geography – women (left) and men (right)**

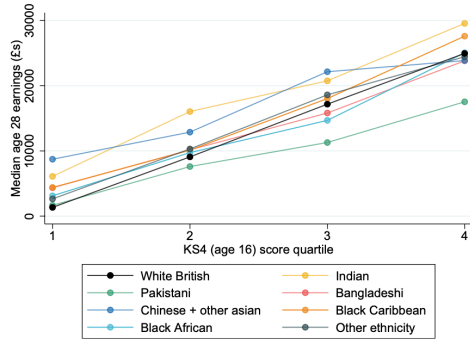


**Figure A7: Average earnings rank of children eligible for Free School Meals across ethnicity and geography – women (left) and men (right)**

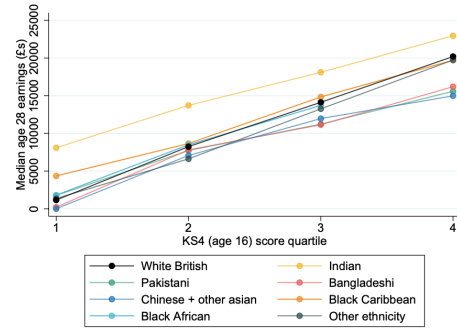


**Figure A8: Labour market median earnings at age 28 by education attainment at age 16 among women eligible for FSM at age 16 by geographic location:**

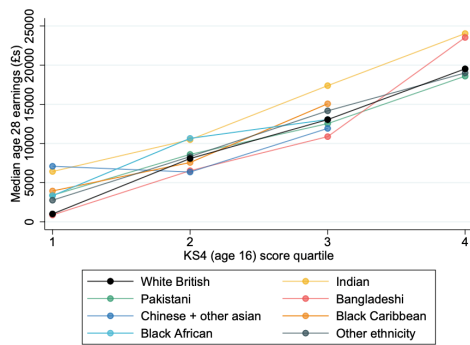
London:



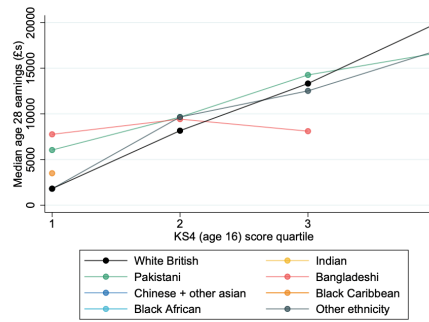
Major urban (excl London):



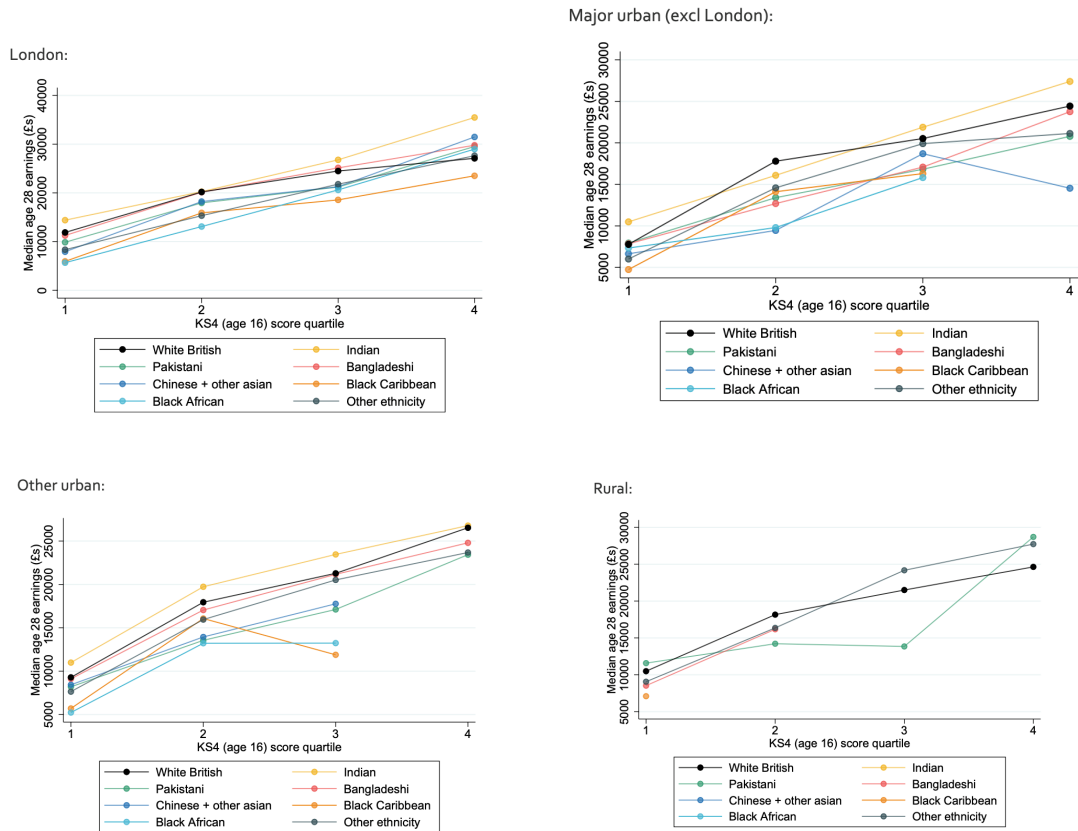
Other urban:



Rural:

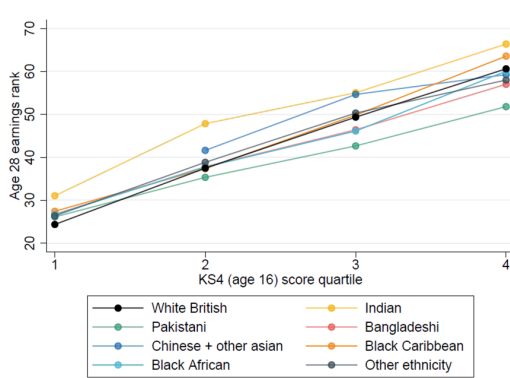


**Figure A9: Labour market median earnings at age 28 by education attainment at age 16 among men eligible for FSM at age 16 by geographic location:**

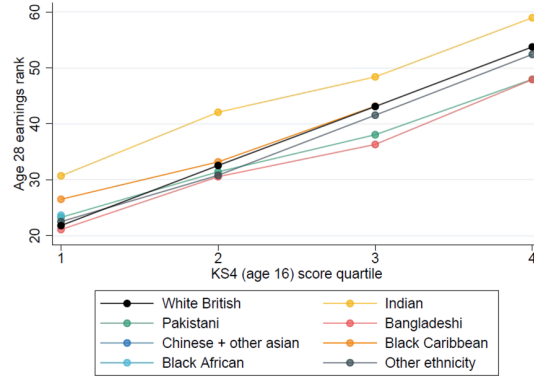


**Figure A10: Earnings rank at age 28 by education attainment at age 16 among women eligible for FSM at age 16 by geographic location:**

**London**

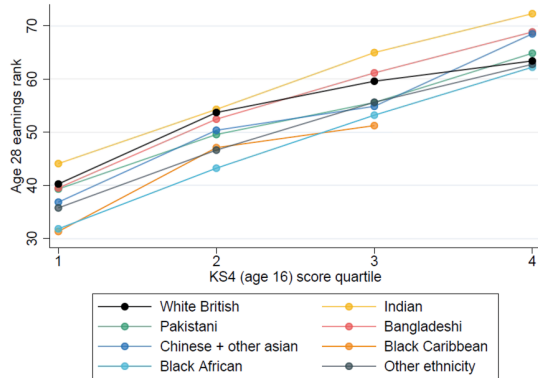


**Major urban (excl London)**

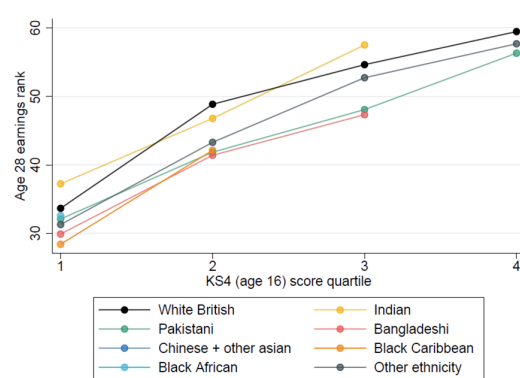


**Figure A11: Earnings rank at age 28 by education attainment at age 16 among men eligible for FSM at age 16 by geographic location:**

**London**



**Major urban (excl London)**



---

Figure