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Intergenerational Wealth Transmission and Mobility in Great Britain: What Components of Wealth Matter?

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Non-Technical summary

The rapid widening of intergenerational wealth inequalities has led to sharp differences in living standards in Great Britain. Understanding which components of wealth are driving such inequalities is important for improving wealth and social mobility. We show the change in the intergenerational persistence in wealth in Great Britain is due to inequality in offspring housing wealth and that offspring homeownership has become increasingly stratified by parental wealth even after controlling for individual's own characteristics. Our findings imply the intergenerational wealth elasticity in housing wealth is set to double in approximately one century and highlight the increasingly important role parental wealth has for determining whether offspring hold and the rate at which they accumulate particular types of wealth.

Intergenerational wealth transmission and mobility in Great Britain: what components of wealth matter?

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Abstract

The rapid widening of intergenerational wealth inequalities has led to sharp differences in living standards in Great Britain. Understanding which components of wealth are driving such inequalities is important for improving wealth and social mobility. We show the change in the intergenerational persistence in wealth in Great Britain is due to inequality in offspring housing wealth and that offspring homeownership has become increasingly stratified by parental wealth even after controlling for individual's own characteristics. Our findings imply the intergenerational wealth elasticity in housing wealth is set to double in approximately one century and highlight the increasingly important role parental wealth has for determining whether offspring hold and the rate at which they accumulate particular types of wealth.

Keywords: Wealth, Housing, Inequality, intergenerational mobility, Great Britain.

JEL classification: D31, D63, I24

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1. Introduction

Wealth is an important determinant of individual living standards, for example it allows individuals to smooth consumption over the lifecycle and as such can help facilitate major lifecycle decisions. However, only recently has it been possible to show the extent to which wealth holdings differ across individuals at a point in time *and* how wealth accumulation varies over time for the same individual (Charles and Hurst, 2003, Boserup et al. 2017, Black et al. 2020). Importantly, evidence suggests wealth holdings are increasingly stratified by family background in advanced economies such as the United States and Great Britain (Killewald et al. 2017; Gregg and Kanabar, 2021). Such research also shows a rapid widening of wealth inequalities which is concerning from a policy perspective for example in the context of improving social mobility and living standards more generally.

When considering individual wealth differences across individuals at a point in time and from an intergenerational perspective it is important to note that certain *types* of wealth usually account for the bulk of total net wealth holdings. In Great Britain this is typically housing and pension wealth (ONS, 2019). Given the rapid increase in intergenerational wealth persistence taking place in Great Britain (see inter-alia Blanden et al. 2021; Gregg and Kanabar 2021) it is therefore crucial to understand whether parental wealth is becoming increasingly correlated with specific *types* of offspring wealth holdings, even after controlling for individuals own characteristics. This is important for understanding the mechanisms which are likely to be driving intergenerational wealth inequalities. Surprisingly, little research has focused on this issue. We address this gap in the literature using high quality British panel data covering a period post the Great Recession and prior to the Covid-19 pandemic.

We document a number of important and policy relevant findings. First, we show intergenerational wealth persistence in GB is driven by differences in offspring housing wealth and this relationship is growing stronger across successively younger cohorts. We estimate that over a six-year period (2010/12-2016/18) parental wealth increases the Intergenerational Wealth Elasticity (IWE) in housing by 0.18 log points, which, if maintained implies the IWE between parent and offspring housing wealth will double in roughly one century. The results based on a rank estimator, which focuses on rank order and not inequality in housing wealth levels per se implies an even faster rate of change, in this case the doubling of the intergenerational correlation will take place in just over six decades. Separately, we show that for individuals with the same level or rank of parental wealth but born six years apart, relative to the slightly older cohort, parental wealth is increasingly associated with homeownership.

We highlight two important issues in this respect. First, not only is parental wealth becoming increasingly associated with having housing wealth *but* conditional on having, is also increasingly correlated with the level of offspring housing wealth. By comparing rates of accumulation along both dimensions across successively younger age cohorts we show homeownership and housing wealth accumulation varies significantly by parental wealth background. Those from the wealthiest parental backgrounds are *three* times more likely to report housing wealth by age 35 and the average level of housing wealth, conditional on holding, is roughly *ten* times higher on average (£105,296 versus £10,536) compared to individuals from the most disadvantaged background. Moreover, on a cohort basis those from the most advantaged backgrounds are no less likely to report housing wealth compared to older cohorts whereas the opposite holds true for those from the least advantaged background. The findings hold even after controlling for a rich set of individual factors including education and earnings which have been shown to be important in determining wealth accumulation (Black et al. 2020; Davenport et al. 2021). Thus, we show the perceived notion regarding access to housing in GB is more nuanced than is generally understood.

Taken together the findings highlight rapidly diverging fortunes for young people. Put differently, the penalty for being born to parents of low wealth is growing rapidly in GB and is increasingly influencing major lifecycle events including homeownership, wealth accumulation and living standards. Indeed, our findings contribute to the debate on intergenerational fairness and the very fabric of the role and functions of society more generally.

The rest of this paper is set out as follows, section two provides a short review of the literature relating to intergenerational wealth transmission. Section three considers data and our methodological approach. In section four we present our findings in two parts. The first part considers intergenerational associations in parent and offspring wealth for different wealth types. We define age groups by six-year age windows to match the panel analysis presented in the second part of the analysis where we consider how intergenerational associations between parent and offspring wealth changes over the sample period for the same individuals, and how rapidly this association is changing for individuals from the same parent background but born 6 years apart. Finally, we show how offspring housing wealth is largely responsible for the rapid change in intergenerational wealth persistence documented in Great Britain. Section five concludes.

2. Literature

A growing body of research shows there exists vast and growing inequalities in wealth holdings over time and across cohorts, and this is strongly related to parental wealth (Charles & Hurst, 2003; Piketty, 2014, Black et al. 2020, Gregg and Kanabar, 2021). Therefore, understanding how parental wealth influences the rate at which individuals born in different periods accumulate particular *types* of wealth is important. In GB total net wealth is typically dominated by housing and pension wealth (ONS, 2019). For example, average total individual net wealth among individuals aged 64 (peak wealth age) was £595,208 in round 6 (2016/18) of the Wealth and Assets Survey (WAS), of which 31% was roughly attributable to housing and 50% to pension wealth respectively. The equivalent statistic for an individual aged 30 was 19% and 28% respectively, likely due to lifecycle effects as only 22% (51%) report having housing (pension) wealth.[1] Even among individuals at peak wealth age 15% on average do not own their home and there is significant variation in both the level of housing and pension wealth holdings. Therefore two issues need to be considered to properly understand wealth accumulation from an intergenerational perspective, particularly with respect to housing wealth: having versus not having and conditional on having, the level, and how this varies by parental wealth.

Blanden et al. (2021) using the WAS show housing wealth becoming increasingly important in explaining wealth inequalities in GB and Davenport et al. (2021) using the same dataset show there exists a strong correlation between the likelihood of offspring homeownership and parental wealth. Similar findings have been reported by Gritti and Cutulli (2021) who using Italian microdata show declining levels of homeownership across successively younger cohorts and, moreover, also show housing wealth becoming increasingly important for explaining within-cohort total wealth inequality. Their findings highlight the differing mechanisms by which housing wealth is transmitted from parent to offspring depending on family background. Specifically, offspring born to parents whose occupation is service based (professional) are more likely to receive direct financial transfers before, at the time of and after leaving the parental home in order to setup a new household. Whereas for those whose parents had low social class occupations this only occurred at the time of leaving the family home. Second, leaving the parental home was associated with a transfer of *housing* wealth from parents to children among the lowest social classes. Thus, parents transfer their own accumulated housing

[1] Figures have been adjusted for inflation and refer to 2015 prices. Estimates are unweighted and include zero values for housing and pension holding.

wealth at the time offspring leave the parental home. No such pattern is observed among those from the most advantaged backgrounds, who instead provide more sustained levels of financial transfers without having to transfer their own housing wealth. Offspring from such backgrounds may still receive housing wealth later in life in the form of inheritance. Such findings highlight not only the strong cultural and familial norms in Italy but, importantly, that homeownership for younger people is socially stratified by family background. Taken together the tentative evidence suggests family background will continue to explain an increasingly larger fraction of offspring total wealth across successively younger cohorts. We contribute to the literature by confirming this conjecture.

A separate but related set of studies highlight the importance of distinguishing and controlling for individual's own characteristics versus that of their parents in explaining wealth inequalities across cohorts (Killewald et al. 2017, Black et al. 2020, Davenport et al. 2021). Black et al. (2020) using Norwegian data show in general individuals *own* labour income and net capital gains on real assets (predominantly housing) play an important role when compared to parental transfers and inheritances in explaining wealth inequalities from a lifecycle perspective. This finding holds for all age cohorts though the relative importance of certain components of wealth does alter depending on which stage of the lifecycle is considered. Black et al. (2020) emphasise that offspring from the most advantaged (wealthiest) backgrounds are more likely to have higher levels of wealth, receive greater levels of inheritance and accumulate a disproportionate amount of wealth from investments and capital income over the lifecycle. Parents can also play an important role in affecting offspring wealth outcomes via early life investments in education which subsequently influence lifetime earnings and pension wealth. Studies based on Scandinavian data bear this out and show that over the lifecycle the intergenerational association in wealth between parents and their offspring generally exhibits a U shape (Boserup et al. (2016, 2018); Aderman et al. (2018)).

Pfeffer and Waitkus (2021) using the Luxembourg Wealth Study decompose country differences in wealth inequality and consider the composition of wealth portfolios. Their results show that cross national variation in wealth inequality and concentration is driven by housing equity. Given the returns from such assets over the lifecycle, the fact access is increasingly stratified by family background has implications for future wealth inequalities both from an intergenerational, cross section and lifecycle perspective (Killewald, Pfeffer and Schachner, 2017; Gritti and Cutulli, 2021). The channels by which parents' transfer resources go beyond direct transfers, for example residing in certain neighbourhoods with high quality schooling,

which in turns influences future earnings and hence offspring wealth accumulation. Such relationships are also important for explaining aggregate level cross country differences in wealth-income inequality ratios (Piketty, 2014; Pfeffer and Killewald, 2015; Black et al. 2020; Palomino et al. 2021). Measured on this basis countries such as the UK, Italy and France exhibit significantly higher wealth-income ratios than Norway and even the US (Black et al. 2020).

Another way to consider transfers and cultural norms jointly affecting intergenerational wealth inequalities is to consider cross country differences in lifetime transfers by family background. Palomino et al. (2021) shows such factors jointly explain between one-third and almost one-half of wealth inequalities in Great Britain and France respectively, and intergenerational transfers alone explain between 26% and 36%, whereas family background explains between 9% and 17% in France and the US respectively. Davenport et al. (2021) estimate roughly half of the intergenerational persistence in wealth in the UK can be explained by individual's own education and earnings, and thus transfers and savings play an important role in explaining wealth inequalities.

Taken together, the international evidence suggests that whilst lifecycle wealth accumulation is likely to be affected by the same individual, household and parental characteristics across countries, the extent and mechanisms by which these characteristics influence the accumulation of particular *types* of assets is likely to differ. Separately, whilst research has shown an association between income and wealth particularly at the top of both respective distributions, at an aggregate level there exists a non-correlation between income and wealth inequality and as previously noted, the latter is largely explained by variation in housing equity (Killewald, Pfeffer and Schachner, 2017; Pfeffer and Waitkus, 2021).

3. Data

Our analysis uses the biennial Wealth and Assets Survey (WAS) representative of Great Britain and managed by the Office for National Statistics (ONS, 2012). In wave 1 WAS contained 30,000 households. A particular feature of WAS is that the survey oversamples wealthier households by a rate of between 2.5 and 3 times compared to other postal addresses to address the issue that household surveys inadequately capture the top part of the wealth distribution (ONS, 2012; Advani, Bangham and Leslie, 2020).

WAS measures of derived individual total net wealth include contributions of housing, pension and savings plus durable assets.[2] Information of mortgage and non-mortgage debt is also captured. The inclusion of durable assets means that net wealth is never zero or negative for those aged 25 plus. Black et al. (2020) show total net wealth measures such as those provided in the WAS dataset which by construction include individual consumption and spending/saving decisions act as good proxies for 'potential wealth' based on actual future wealth accumulation which are not affected by such issues. In addition to asset and debt information WAS collects detailed individual and household level economic and sociodemographic data, including retrospective information relating to individual's parent's circumstances when they were teenagers (aged around 14) which we utilise to construct a measure of parental wealth.

Retrospective Questions

We seek to understand individual's trajectory of holding certain housing, pension and financial wealth as they age and their value by differing family origins. Whilst WAS does not collect information on parental wealth except in the case where adult children live in the same household as their parents, the survey does collect retrospective socioeconomic information relating to survey respondent's parents. We utilise these data to construct markers of parental wealth. The questions of interest are age triggered and asked when an individual is age 25 or above at wave 2 or turns 25 in subsequent waves of the data. Specifically, individuals are asked to recall circumstances in their early teenage years relating to:

(1) their parents housing tenure,
(2) their parent(s) education level,
(3) whether they lived with one or both parents or some other arrangement,
(4) employment status of parents.

[2] Our measure of total net wealth includes pension wealth, Black et al. (2020) exclude this type of wealth (it is not available in their data) from their calculations and argues such wealth should not be included when modelling wealth accumulation. However, our interest is understanding the components of offspring wealth driving the rapid change in the intergenerational persistence in wealth. Even if pension wealth is not transferable, consider the parent generation who can expect income from such wealth (and/or a lump sum as is the case in the UK). This could act as security, or alternatively, parents knowing this wealth is available to them in the future, can utilise/transfer other sources of wealth for example via equity release of their main residence to help provide financial support to their offspring for example to purchase their first home. Turning to offspring, given our aim is to understand which components of wealth are correlated with parental wealth, and housing and pension wealth have been shown to be the two largest subcomponents of total wealth in GB (ONS, 2019), we also include offspring pension wealth in our measure of total wealth when analysing changes in intergenerational correlations over time. Pension wealth is strongly correlated with earnings/labour income and if the relationship between parental wealth and pension wealth is changing over time this is informative for understanding potential mechanisms (such as early life education investments and hence occupation/educational attainment) driving changes in wealth inequalities.

Unfortunately, region of parents' residence, an important determinant of wealth and parental age were not asked. [3]

These markers of parent characteristics are likely to be strongly correlated with available resources of the household in which the teenager grew up (see inter-alia Bladen et al. (2013), Jerrim and Macmillan, (2015) and Gregg et al. (2017)) and correspond to wealth accrual by family origin. As wealth accrual will continue after a young adult has left home (Pfeffer Killewald (2017); Boserup, Kopczuk and Kreiner (2017); Aderman, Lindhal and Waldenstrom (2018); Black et al. (2020); Gregg and Kanabar, 2021), the age at which these were collected is not the focus but rather they are markers for assessing relative wealth position of the parents. Put differently, in order to accurately estimate intergenerational wealth persistence, by wealth type, we need to assess if these characteristics are largely stable between when a child was aged 14 or so and parents are in their 40s, to when the parents reach peak wealth age (64). With this stability the measures reflect differences in wealth holding across groups at ages 40 through to 64. This presents two methodological challenges which must be addressed. First, we do not observe true wealth of parents but rather proxy markers. Second, these are not measured at around the time of peak wealth but when parents were aged around 40. It is important to note that for most of the offspring sample we observe their true wealth before they have reached peak wealth age however we do not correct for this, precisely because one of our central research questions is to understand how accumulation of particular wealth types varies by parental background at different offspring ages.

In Appendix B we document trends in wealth accumulation by wealth type based on our parental markers using cross section data collected at wave 3 of WAS. Figures B1-B4 therefore refer to wealth levels reported by different individuals at a single point in time. Similar to the pattern found for total wealth there is a clear difference across age groups in the levels reported by parent background and these differences tend to fan out at increasingly older ages. Importantly, the pattern or ordering across age groups by parent background holds across almost all age groups and wealth types. However, what Figures B1-B4 do not show is the proportions of individuals who do and do not report holding particular types of wealth by parent background. This distinction is important, particularly when trying to understand the factors driving the change in intergenerational associations in wealth. Appendix C reports coefficients

[3] The questionnaire wording is as follows: "We are interested in how living standards compare across generations, so the following questions are about your family and parents. I'd like you to think back to when you were a young teenager, say between the ages of 12 and 16." An additional question also asked about presence of siblings which is not utilized for the purpose of this study.

from a logit regression modelling the association between offspring holding particular wealth types and parental wealth, the results show a strong positive correlation across all age groups and successively younger cohorts at wave 3 of WAS.

Methodology

Starting from wave 3 onwards (2010-12) WAS released consistent measures of individual total wealth and its subcomponents including housing wealth, pension wealth and financial wealth. These variables are defined in Appendix A**.** When using wealth data for analysis purposes two issues need be addressed (Pence, 2006). First, wealth data has a long thick right-hand tail where some very high values can lead to misleading conclusions when assessing at the mean such as with OLS, and so analysis across the distribution is important (Killewald, Pfeffer and Schachner, 2017). Second, individual total net wealth reported in WAS is not zero or negative except for a very small number of individuals at young ages because a wide range of assets including durable goods and physical wealth are included.

Certain subcomponents of wealth such as housing and pension wealth are zero for many individuals, especially at younger ages and this value is economically meaningful. Therefore, log transformation cannot be applied except for analysis involving total net wealth. Pence (2006) and Ravallion (2017) show transforming the data by applying the Inverse Hyperbolic Sine (IHS) for wealth values greater than or equal to zero allows one to estimate wealth regressions including all available data.[4] Depending on the specification the coefficients from these types of regressions can be interpreted as a type of elasticity (Bellemare and Wichman, 2020). When estimating regressions of interest we estimate log-log specifications for total net wealth and for all other types of wealth we apply the IHS transformation to both offspring and parental wealth. In the case of financial wealth, a non-trivial proportion of individuals hold net negative values of such types of wealth and when modelling intergenerational associations for this type of wealth we use a rank estimator.[5]

We next set out our modelling approach. Starting with current wealth in the offspring generation and retrospective measures of parental wealth markers Equation (1) specifies the

[4] IHS is approximately equal to $\log(2y_i)$ or $\log(2) + \log(y_i)$ except for very small values and can be interpreted (in regression) in exactly same way as log. Very close to zero the IHS transformation is approximately linear.

[5] Whilst it has been shown the IHS transformation can be applied to negative values, the properties of the transformation imply values will spread out rather than be compressed given the transformation is concave over the entire real line (Ravallion, 2017).

ideal regression form assessing the relationship between offspring's wealth and parent's characteristics:

$$IHSW_{current\ age} = \alpha + \beta\ IHSWh_{parent\ 64} + \varepsilon \quad (1)$$

Where:

$W_{current\ age}$ is true adult children's wealth at their current age, without reporting error.

$Wh_{parent64}$ is wealth of parents when they were aged 64, just before retirement of the main earner but unlike for offspring this is a household measure and without reporting error.

Our focus is to understand how family background affects accumulation of certain asset types and, in particular, how this is changing across cohorts and time at *current* age. To estimate Equation 1 requires long panel data at both individual and household level which is not readily available in the UK.

Given this, the data available has two substantive issues which will deviate from this ideal. First, as discussed, parental wealth is not directly observed but estimated using a limited set of proxy indicators, consisting of a vector of five groupings of parent's characteristics based on their education level (high, medium and low) interacted with housing tenure status (homeowner or renter). Second, parents are also likely to deviate from the age of peak wealth which is just on retirement. These will create issues of measurement error and therefore attenuation bias and life-cycle bias follow from the age issues (see inter-alia Dearden, Machin and Reed (1997); Haider and Solon (2006) and Gregg et al (2017) for discussions of these respective biases in the context of intergenerational earnings).

We address each of these in turn. Equation (2) specifies the relationship of interest:

$$IHSW_{offspring,\ current\ age} = \pi + \beta IHSW_{parent\ 64} + \vartheta \quad (2)$$

Where:

$W_{offspring,\ current\ age}$ is adult children's wealth, by type, at their respective age. Beyond age 45 there is little data for parents of adult children. $W_{parent\ 64}$ represents the wealth of parents at peak wealth age. This is not directly observed, instead we have

X_{wealth_parent}= parent's observed characteristics

These are the markers of family origin. To attach wealth values to these parental groupings we adopt the Two Sample Two Stage Least Squares (TSTSLS) estimator, first used in the intergenerational context by Björklund and Jäntti (1997). We estimate parental wealth using a sample of individuals aged 64 in WAS based on their own reported education and housing tenure. These are the same retrospective parental markers which offspring report. The predictions from this regression allows us to estimate the unobserved wealth of parents, $IHS\ \widehat{W}_{parent\_wealth}$ in equation (3).

In Equation 3 the estimated β under TSTSLS deviates from the Equation 1 such that when parent's actual wealth is not observed then the following parameters are estimated:

$$IHS\ W_{offspring} = \xi + \beta_1 IHS\ \widehat{W}_{parent\_wealth} + \gamma \tag{3}$$

Where

$$Plim\beta = \frac{\sigma_{\widehat{w}p,ow}}{\sigma_{\widehat{w}p^2}}\ which\ under\ TSTSLS\ becomes\ Plim\beta_{TSTSLS} = \frac{\sigma_{\overline{\mathrm{xw}},ow}}{\sigma_{\overline{\mathrm{xw}}^2}} \tag{4}$$

Where σ_{xw} (σ_{ow}) refers to the standard deviation in parents (offspring) wealth. A hat denotes the predicted value based on alternative survey data given we do not directly observe parent's wealth but instead estimate it using the following equation:

$$IHS\ \widehat{W}_{parent\_wealth} = \lambda + \omega X + \varphi \tag{5}$$

In (5) the dependent variable is parent's total wealth from a sample of individuals aged 64 at wave 3, and X is the vector of their characteristics (own housing tenure and education interacted) given the retrospective questions.

Measurement error and bias

Reporting error and/or transitory fluctuations in wealth create inconsistent estimates of β from Equation 1. Classical measurement error in the RHS variable would result in downward attenuation bias in the estimates resulting from this measurement error. The preferred approach to addressing this bias is averaging over repeat observations for the same individuals. For long panel data this is often not available in the parental generation except for certain countries such as those in Scandinavia and the US (Aderman, Lindhal and Waldenstrom (2018); Boserup, Kopczuk and Kreiner (2013, 2017); Black et al. (2020)).

The alternative approach is to predict earnings with markers of permanent differences in characteristics associated with earnings such as education, occupation, and industry (Dearden, Machin and Read (1997) do this using markers from within the same sample). The approach we follow (TSTSLS) does the same but in our case using wealth predicted in a separate sample albeit from the same survey. Jerrim, Choi and Rodriquez (2014) show there is an upward bias to estimates when there are a limited set of predicting variables because the reduced variance of $\sigma^2_{\overline{XW}}$ compared to σ^2_{XW} is not offset by the increase covariance in the numerator $\sigma_{\overline{\mathrm{xw}},ow}$ from purging of the measurement error. Given our restricted set of predictors for parental wealth this is likely to be an issue. Whilst potential solutions have been proposed in the literature such as cross validating offspring and parental characteristics to ensure offspring recall their parent's characteristics correctly, this is not possible in WAS unless adult offspring live in the same household as their parents (only a small sample do this). One can also consider different combinations of imputer variables though we note WAS asks a limited set of questions relating to parental characteristics and using more detailed parental groupings leads to small sample issues for some age groups, nonetheless preliminary analysis shows our main findings hold.

Alternatively, Jerrim et al. (2014) note one can consider using a rank estimator which is not subject to the variance reduction issue, and relies solely on the ordering of parental characteristics as opposed to imputing parental wealth based on these characteristics to model intergenerational associations. We adopt this approach. Thus, Rank-Rank regression provides an accurate estimate of the intergenerational rank correlation and is more efficient but does not capture wealth inequalities across generations, just the degree of re-ordering of individuals.[6] In the case of our wealth measures of interest whether the β estimate is likely to be larger or smaller than the Rank-Rank estimate will depend on the age at which wealth (type) is measured and the relative levels of inequality across cohorts. For certain components of wealth such as housing and pensions, individuals may report zero holdings particularly at young ages, the transformations we apply to the data mean that in these cases the β estimate will be larger than the corresponding estimate computed using a rank estimator.

[6] A much more recent line of work has explicitly incorporated classical and non-classical forms of measurement error when estimating rank regressions, acknowledging the potential attenuation bias which may arise from using 'errors in variables' and noting the potential of using biased corrected estimators (see inter-alia Nybom and Stuhler, (2017); Kitigawa, Nybom and Stuhler, (2018)). These authors also note that potential biases are smaller for rank based estimators compared to elasticity type measures typically used and the importance of age when measuring elasticities (lifecycle effects), something we formally account for in our analysis. The complexity of these new methods, data requirements and the fact we use a TSTSLS approach mean we do not incorporate such estimators in our analysis though do attempt to deal with measurement error as set out in the text and emphasise careful interpretation of our findings in light of these works.

Life-Cycle Bias

From a modelling perspective, our estimates will be affected by the profile of lifecycle wealth accumulation, which typically exhibits a rapid divergence before and after peak wealth age (64) and this is attributable to both age and cohort effects. The parental generation are assumed to be at peak wealth age for the purposes of the TSTSLS estimation in Equation 5. In terms of the offspring generation, we consider individuals up to peak wealth age.

The intergenerational earnings literature shows that in the offspring generation the lower inequality in earnings at younger ages produces a downward life-cycle bias to estimates of the β (Haider and Solon (2006) and Bohlmark and Lindquist (2006)). This is reflected by the regression coefficient where life-time earnings are regressed on point in time earnings lies below 1. Earnings in a person's late 30s gives an unbiased estimate of the intergenerational β and in the mid-40s estimates are upward biased. The expansion of wealth inequalities as people move closer to retirement, see Appendix B, means this is also likely to hold true for wealth and to continue through to retirement age. Gregg and Kanabar (2021) show the inequality in wealth at younger ages in GB is such that it is sufficient to overturn the lifecycle bias. Separately, Boserup et al. (2016, 2018) and Aderman et al. (2018) using Scandinavian data find the intergenerational persistence in wealth follows a U-shape namely that the rank-rank measure is higher at younger ages, declines as individuals age up until their 40s and then increases following the death of their parents. Thus, the underlying ordering of people by own and parental wealth holdings is also heavily influenced by bequests and need not have the same age relationship as the amounts of wealth held. In Rank-Rank regression life-cycle biases are much smaller as inequalities have no influence, just the rank ordering. Gregg and Kanabar (2021) using WAS data estimate the intergenerational persistence in wealth correcting for the lifecycle bias in both offspring and parent generation and show the lifecycle profile of the rank-rank measure for total net wealth based on WAS data follows a shallow U-shaped profile.

Our analysis includes offspring aged between 29 and 64, hence their parents are roughly aged between 59 and 94. If we predicted parental wealth at these ages using a separate sample of individuals in WAS this would lead to bias estimates due to lifecycle effects. The youngest parents would be just prior to peak wealth and the oldest well past peak wealth age (90+) and so selection would also be an issue. To avoid this we estimate parental wealth for all parents based on a sample of individuals aged 64 (corresponding to peak wealth age when inequalities in wealth holdings are greater) using the education and housing tenure reported by individuals themselves in WAS. This is changing the age for the TSTSLS estimation and is not a prediction

of what their wealth will be (or was) at age 64. As such the Rank-Rank estimates are unaffected by this, as the rank ordering across our vector of parental characteristics is stable at these ages. As parental characteristics are observed even if deceased, we can attach these values to all parents, including those offspring whose parents are aged over 75. This offers a common approach to estimating intergenerational wealth patterns for offspring for all ages. For the offspring generation no such adjustment is required as our central interest is understanding how inequality in *current* wealth holdings by wealth type (not peak) relate to peak parental wealth.

The estimates for different age groups reported in the next section will both reflect life-cycle differences across age but also differences across cohorts. Such cohort differences in wealth accumulation have been shown to be significant from an intergenerational perspective (Resolution Foundation, 2017) and we return to this issue by considering wealth accumulation by wealth type across cohorts and over time in the final part of section 4. We also utilise the short panel to explore life-cycle changes within cohorts. Over a 6-year periods we show the evolution of the estimated intergenerational β and the Rank correlation, by wealth type, as people age and by a chain extension over the life-course. We pool wave 3 and round 6 of WAS to compare how the IWE is changing for each wealth type across the 6-year period between survey waves (2010/12 and 2016/18) for individuals at the same age except born 6-years apart. We use an identical approach to assess whether parental wealth is becoming increasingly associated with homeownership across successively younger cohorts.

4. Estimation results

We present our findings in two parts. First, we analyse intergenerational associations in parent and offspring wealth for different wealth types based on single cross section (wave 3) of WAS (2010-12), in the second half of the findings section we consider changes for the *same* individuals over time. In order to match the panel length we define age groups using six year age windows. By defining age groups in this way, we can compare cohort on cohort changes at the same age and by chain extension analyse the trend across the lifecycle. This allows us to highlight the role parental background has in explaining the overall change in the intergenerational association between parent and offspring wealth, by wealth type, across time rather than drawing inference based on a static point in time estimate. We do this for both β and rank type regressions to highlight the rapid widening of wealth inequalities from a longitudinal perspective. As noted, an important aspect in this context is to consider offspring holding a certain type of wealth versus level differences conditional on holding and we show

parental wealth plays an important role in this respect both from a cohort and intergenerational perspective.

Cross section analysis

Table 1 reports TSTSLS estimates of intergenerational β by wealth type for offspring across age groups. Taking each wealth type in turn Table 1 shows that in the case of total net wealth at wave 3 between 34% and 46% of wealth differences in the parent generation are passed on to offspring aged between ages 29 and 64. The pattern (irrespective of time period analysed) suggests the strength of this association declines across successively older age groups and is consistent with recent evidence on intergenerational wealth transmission in GB (see Gregg and Kanabar, 2021; Blanden, Eyes and Machin. 2021 and Davenport et al. 2021).

Turning to housing wealth, Table 1 shows parents' total wealth is strongly associated with offspring housing wealth and that this relationship is also stronger at younger ages. The presence of individuals with zero values (no housing wealth) and some with very high levels of such wealth leads to the higher estimated elasticities compared to estimates reported for total net wealth. The elasticity computed for offspring aged between 29 and 34 is 1.82 (so a 1% increase in parental wealth increases offspring housing wealth by 1.82%), over double that of the oldest group, whilst the β specification accounts for the variation in levels offspring housing wealth, from an intergenerational and lifecycle perspective, we measure wealth relatively early for younger age groups and thus housing wealth both having versus not having and conditional on the former, the level is likely to change. However, our focus is to report differences in holdings at *current* ages and how this varies by parent background. The associations estimated at round 6 are similar in trend and magnitude as that reported for wave 3. The rate at which individuals accumulate certain types of wealth by family background (if at all) is important if we are to understand how family background and wealth mobility are linked and we return to this issue later in the paper.

Table 1: Intergenerational elasticity in offspring and parent wealth, wave 3 and 6 [offspring current age, parents peak].

Age group	29-34	35-40	41-46	47-52	53-58	59-64
Central birth years	1979-1980	1973-1974	1967-1968	1960-1961	1954-1955	1948-1949
Wave 3 (2010-12)						
Total wealth	0.46*** [0.04]	0.43*** [0.03]	0.41*** [0.03]	0.37*** [0.03]	0.44*** [0.03]	0.34*** [0.02]
housing wealth	1.82*** [0.16]	1.57*** [0.15]	1.24*** [0.12]	1.20*** [0.11]	1.18*** [0.10]	0.86*** [0.08]
pension wealth	1.54*** [0.15]	1.39*** [0.14]	1.00*** [0.11]	0.83*** [0.1]	1.07*** [0.10]	0.57*** [0.10]
N_{total}	1299	1893	2362	2420	2364	2841
$N_{housing}$	1298	1902	2359	2425	2374	2846
$N_{pension}$	1340	1938	2386	2442	2377	2847
Age group	29-34	35-40	41-46	47-52	53-58	59-64
Central birth years	1985-1986	1979-1980	1973-1974	1967-1968	1960-1961	1954-1955
Wave 6 (2016-18)						
Total wealth		0.57*** [0.06]	0.43*** [0.06]	0.44*** [0.05]	0.43*** [0.04]	0.41*** [0.04]
housing wealth		2.20*** [0.25]	1.57*** [0.22]	1.32*** [0.17]	1.32*** [0.15]	1.23*** [0.12]
pension wealth		1.48*** [0.23]	1.15*** [0.20]	0.98*** [0.17]	0.78*** [0.13]	0.78*** [0.13]
N_{total}		573	894	1102	1266	1381
$N_{housing}$		575	898	1107	1269	1382

$N_{pension}$		579	899	1110	1270	1383

Notes: respective regressions model offspring wealth level on age and parent's wealth. Standard errors clustered at individual level. Log transformation applied to offspring and parent's wealth in specification modelling total net wealth. In all other regressions inverse sine transformation applied and elasticity computed at mean values of offspring and parent wealth as suggested by Bellemare & Wichman (2020) and standard errors adjusted accordingly. Samples restricted to observations with dependent variable greater than or equal to zero. Grey boxes refer to age groups where sample size is too small for estimation purposes. Wave 3 of WAS corresponds to (2010-12) and wave 6 (2016-18). Wealth values adjusted for inflation prior to transformation and reflect 2015 prices. Small discrepancy in number of observations due to negative values (affects total net wealth and net housing wealth) which are dropped for analysis purposes.

Table 1 also reports the IWE for pension wealth. Whilst parents may transfer wealth directly and thereby influence offspring total and housing wealth levels, pension wealth is driven by offspring's education and occupation. Family background is likely to play an important role for example via early life investments in children's education, and from an intergenerational perspective evidence suggests there is a strong link between parent's and children's job class (Killewald, Pfeffer and Schachner, 2017; Oren, Caduri, Tziner, 2013). Table 1 shows the intergenerational elasticity between total parent net wealth and offspring pension wealth has a similar pattern to that reported for housing, the estimated elasticity is much larger at younger ages versus older groups due to the presence of zero pension wealth holdings and because we observe offspring pension wealth below peak wealth age. The fact pension and housing wealth account for the majority of individual's total wealth (ONS, 2019) and is influenced by parental wealth underlines the importance of understanding how rapidly pension wealth is accumulated over time and how this is changing across successively younger cohorts. We return to this issue later in the paper.

Table 2 reports rank estimates of intergenerational associations for different wealth types.[7] Importantly, the presence of zero holdings of certain wealth types which are economically meaningful can be accommodated for and the estimates do not suffer from an upward bias as is the case for the IWE estimates (Jerrim et al., 2014). The main limitation of a rank estimator is that the magnitude of wealth differences in both generations are not accounted for in

[7] We do not report results for financial wealth because a non-trivial proportion of individuals in our sample report negative holdings. Ravallion (2017) notes whilst the IHS transformation can be applied to negative values the properties of the transformation imply values will spread out rather than be compressed given the transformation is concave over the entire real line.

estimation and therefore one cannot get a sense of how this affects intergenerational elasticities across different age groups. For example, comparing the rank-based estimates for housing shows these are largely stable across age groups versus the beta estimates, highlighting the significant variation in housing wealth among parent and offspring generations. In particular, for offspring groups and especially at younger ages the tails of the distribution (so zeros and very high values) are likely to lead to a divergence between rank and beta estimates. Table 2 shows that for total wealth family background becomes increasingly important in influencing offspring wealth based on rank-order across successively younger cohorts.

Table 2 shows a strong positive association between parental and offspring wealth types based on a rank estimator. The magnitude of the estimated coefficients is remarkably stable across age groups in the case of housing and financial wealth. The estimates imply that increasing total parent wealth by one decile leads to offspring housing wealth (financial wealth) increasing by approximately 3-3.6 (2.1-3) rank points. In the case of pension wealth a clear pattern emerges, across successively younger cohorts the rank estimates increases from 0.17 for those aged between 59 and 64 to 0.3 among 29-34 year olds, which is identical to the rank estimate calculated for housing wealth for the latter group. However, the mechanisms which drive the rate at which offspring accumulate certain wealth types is unlikely to be the same and the results in Table 2 do not account for the magnitude of level differences in wealth holdings across individuals. Nonetheless, the results show at least at current ages, irrespective of wealth type and time period considered, family background matters.

The widespread availability of generous pension schemes in the 1960s mean pension wealth levels observed among those in their late 50s and the rate at which these individuals accumulated this type of wealth is unlikely to be repeated by younger cohorts, in particular among individuals from less advantaged backgrounds who typically have much lower levels of lifetime pension wealth including just prior to retirement (see appendix B). Whilst policies have recently been implemented to address pension adequacy and the expansion of higher education in GB during 1960s has led to a greater proportion of individuals in the labour market working in professional occupations, pension wealth accumulates at very different rates by family background across age groups as we will show in a later section of the paper.

Table 2: Intergenerational rank in offspring and parent wealth, wave 3 and 6 [offspring current age, parents peak].

Age group	29-34	35-40	41-46	47-52	53-58	59-64
Central birth years	1979-1980	1973-1974	1967-1968	1960-1961	1954-1955	1948-1949
Wave 3						
Total wealth	0.40*** [0.03]	0.36*** [0.02]	0.33*** [0.02]	0.30*** [0.02]	0.37*** [0.02]	0.33*** [0.02]
housing wealth	0.30*** [0.03]	0.30*** [0.02]	0.31*** [0.02]	0.30*** [0.02]	0.36*** [0.02]	0.35*** [0.02]
pension wealth	0.30*** [0.03]	0.28*** [0.02]	0.20*** [0.02]	0.19*** [0.02]	0.23*** [0.02]	0.17*** [0.02]
financial wealth	0.21*** [0.03]	0.24*** [0.03]	0.22*** [0.02]	0.23*** [0.02]	0.30*** [0.02]	0.26*** [0.02]
N_{total}	1299	1893	2362	2420	2364	2841
$N_{housing}$	1298	1902	2359	2425	2374	2846
$N_{pension}$	1340	1938	2386	2442	2377	2847
$N_{financial}$	1340	1938	2386	2442	2377	2847
Wave 6						
Total wealth		0.44*** [0.04]	0.34*** [0.04]	0.33*** [0.03]	0.32*** [0.03]	0.33*** [0.03]
housing wealth		0.37*** [0.04]	0.33*** [0.04]	0.34*** [0.03]	0.36*** [0.03]	0.40*** [0.02]
pension wealth		0.32*** [0.04]	0.24*** [0.04]	0.23*** [0.03]	0.21*** [0.03]	0.20*** [0.03]
financial wealth		0.18*** [0.04]	0.23*** [0.04]	0.26*** [0.03]	0.26*** [0.03]	0.29*** [0.03]
N_{total}		573	893	1102	1266	1381
$N_{housing}$		575	898	1107	1269	1382
$N_{pension}$		579	899	1110	1270	1383

$N_{financial}$		579	899	1110	1270	1383

Notes: respective regressions model rank of offspring wealth level on age and rank of parent's wealth. Standard errors clustered at individual level. Log transformation applied to offspring and parents' wealth in specification modelling total net wealth. In all other regressions respective wealth levels inverse sine transformation applied and elasticity computed at mean values of offspring and parent wealth as suggested by Bellemare & Wichman (2020) and standard errors adjusted accordingly. Grey boxes refer to age groups where sample size is too small for estimation purposes. Wave 3 of WAS corresponds to (2010-12) and wave 6 (2016-18). Wealth values adjusted for inflation prior to transformation and reflect 2015 prices. Discrepancy in number of observations due to negative values (affects total net wealth and net housing wealth) which are dropped for analysis purposes.

Panel analysis

The findings based on Tables 1 and 2 compare different individuals at two points in time. A key question then is to understand how intergenerational wealth persistence for different wealth types is changing across time for the *same* individuals.

We construct short 6-year (two wave) balanced panels corresponding to wave 3 and 6 of WAS (2010/12- 2016/18) and define age groups in such a way that we can compare changes in IWE and rank estimates for individuals at the same age but born exactly 6 years apart. This allows us to document the changing role parental wealth has in explaining the variation in offspring wealth by wealth type and as individuals age.

Table 3: IWE and rank estimates for total wealth based on cross section and 6-year panel by age (offspring current age, parents peak wealth).

Age group at wave 3	29-34	35-40	41-46	47-52	53-58	59-64
Central birth years	1979-1980	1973-1974	1967-1968	1960-1961	1954-1955	1948-1949
Log-Log						
β cross section full sample wave 3	0.46*** [0.04]	0.43*** [0.03]	0.41*** [0.03]	0.37*** [0.03]	0.44*** [0.03]	0.34*** [0.02]
β balanced panel wave 3	0.43*** [0.06]	0.41*** [0.05]	0.43*** [0.05]	0.36*** [0.04]	0.42*** [0.04]	0.33*** [0.03]

β balanced panel round 6	0.59*** [0.07]	0.43*** [0.06]	0.44*** [0.05]	0.40*** [0.05]	0.43*** [0.04]	0.36*** [0.03]
Rank-rank						
rank cross section full sample round 3	0.40*** [0.03]	0.36*** [0.02]	0.33*** [0.02]	0.30*** [0.02]	0.37*** [0.02]	0.33*** [0.02]
rank balanced panel wave 3	0.44*** [0.04]	0.33*** [0.04]	0.33*** [0.03]	0.30*** [0.03]	0.35*** [0.03]	0.34*** [0.02]
rank balanced panel round 6	0.47*** [0.05]	0.32*** [0.04]	0.34*** [0.03]	0.30*** [0.03]	0.35*** [0.03]	0.36*** [0.02]
$N_{offspring}$ cross section wave 3	1299	1893	2362	2420	2364	2841
$N_{offspring}$ balanced panel	460	784	974	1112	1269	1628

Notes: *** p<0.01, ** p<0.05, * p<0.1. First row refers to regression of offspring wealth on parent's wealth controlling for age within 6-year age group. Both total offspring and parent net wealth have been log transformed. Second and third row is identical to first row except sample is based on balanced panel of individuals observed at wave 3 (2010/12) and round 6 (2016/18). Wealth values adjusted for inflation prior to transformation and reflect 2015 prices. Small discrepancy in number of observations due to negative values (affects total net wealth and net housing wealth) which are dropped for analysis purposes.

Table 3 shows the findings reported in the first part of section 4 based on our cross-section sample largely hold for the balanced panel: parental wealth is playing an increasingly important role in explaining offspring total net wealth outcomes, especially for the youngest cohort in our sample when we consider the *same* individuals over time. The top panel of Table 3 shows that the IWE increases from 0.33 for the oldest group who are just prior to peak wealth age to 0.44 for those aged 29-34, and within our six-year panel the IWE increases to 0.59 by 2016/18 for this age group which is high by international standards (Boserup, 2017). Whilst there is some variation across age groups, the general pattern is clear and suggests a divergence in fortunes for younger age groups, a key question then is to understand which types of wealth are driving this change, an issue we consider next. By defining age groups to match the panel length we can compare cohort on cohort changes in IWE for individuals at the same age but born six years apart. The general pattern is such that the IWE is rising and the divergence in wealth outcomes even over this short period is significant for most age groups.

The bottom part of Table 3 reports rank estimates and here we see a relatively flat profile across groups except for the youngest age group. We note the magnitude of the change within the panel is less pronounced relative to the beta estimates. However, irrespective of the regression approach the panel analysis highlights the change in intergenerational wealth transmission taking place for the same individuals over time, which is not visible in the cross section estimates reported in Table 2. These results are consistent with recent evidence on intergenerational wealth inequality in GB (see Gregg and Kanabar, 2021; Blanden et al. 2021; Davenport et al. 2021), however our focus is to document which components of total wealth are driving the overall change seen in Table 3. We consider three components of total wealth in this respect: housing, pension, and financial wealth.[8]

Table 4: IWE and rank estimates for housing wealth based on cross section and 6-year panel by age (offspring current age, parents peak wealth).

Age group at wave 3	29-34	35-40	41-46	47-52	53-58	59-64
Central birth years	1979-1980	1973-1974	1967-1968	1960-1961	1954-1955	1948-1949
Log-Log						
β cross section full sample wave 3	1.67*** [0.2]	1.49*** [0.14]	1.18*** [0.12]	1.14*** [0.11]	1.14*** [0.10]	0.83*** [0.08]
β balanced panel wave 3	1.89*** [0.26]	1.54*** [0.22]	1.19*** [0.18]	1.22*** [0.16]	1.11*** [0.13]	0.76*** [0.10]
β balanced panel round 6	1.93*** [0.30]	1.49*** [0.22]	1.21*** [0.18]	1.26*** [0.16]	1.23*** [0.12]	0.86*** [0.10]
Rank-rank						
rank cross section full sample round 3	0.3*** [0.03]	0.30*** [0.02]	0.31*** [0.02]	0.30*** [0.02]	0.36*** [0.02]	0.35*** [0.02]

[8] We do not separately analyse physical wealth given the relatively small contribution this makes to total net wealth for the majority of individuals in our sample.

rank balanced panel wave 3	0.35*** [0.04]	0.29*** [0.04]	0.31*** [0.03]	0.31*** [0.03]	0.37*** [0.03]	0.36*** [0.02]
rank balanced panel round 6	0.37*** [0.05]	0.33*** [0.04]	0.34*** [0.03]	0.35*** [0.03]	0.40*** [0.03]	0.36*** [0.02]
$N_{offspring}$ cross section wave 3	1299	1893	2362	2420	2364	2841
$N_{offspring}$ balanced panel	460	784	974	1112	1269	1628

Notes: first row refers to regression of offspring housing wealth on parent's wealth controlling for age within 6-year age group. Both offspring and parent net wealth have been transformed using inverse hyperbolic sine transformation, elasticity computed at mean values of offspring and parent wealth as suggested by Bellemare & Wichman (2020) and standard errors adjusted accordingly. Second and third row is identical to first row except sample is based on balanced panel of individuals observed at wave 3 (2010/12) and round 6 (2016/18). Wealth values adjusted for inflation prior to transformation and reflect 2015 prices.

Table 4 reports IWE and rank estimates for housing wealth based on the balanced panel sample. Across cohorts the general pattern is clear: the IWE estimate is larger for successively younger cohorts *at the same age*. Thus, parental wealth is increasingly associated with housing wealth across successively younger cohorts despite policies been introduced to specifically improving access to homeownership.

Table 4 also shows, as expected, that at higher ages the magnitude of the coefficient IWE and rank correlation falls. This is likely to be related to both lifecycle and cohort effects. For example, in our sample data 40% (10%) of individuals in the 29-34 (59-64) age group report zero housing wealth. Indeed, the rank based estimates which are not affected any type of data transformation imply the intergenerational association is relatively stable.

The difference in the beta versus rank estimates suggests widening inequality in housing wealth, particularly at younger ages. There are two issues to consider: having versus not having such wealth and conditional on the former the level. Thus, in order to understand which components of wealth are responsible for driving the change in intergenerational persistence over time in Great Britain one has to consider the age and rate at which offspring accumulate particular types of wealth. We return to this issue in a later section of the paper.

Table 5: IWE and rank estimates for Pension wealth based on cross section and 6-year panel by age (inverse hyperbolic sine specifications).

Age group at wave 3	29-34	35-40	41-46	47-52	53-58	59-64
Central birth years	1979-1980	1973-1974	1967-1968	1960-1961	1954-1955	1948-1949
Log-Log						
β cross section full sample wave 3	1.42*** [0.14]	1.32*** [0.13]	0.96*** [0.11]	0.79*** [0.10]	1.03*** [0.10]	0.55*** [0.10]
β balanced panel wave 3	1.55*** [0.24]	1.22*** [0.21]	1.13*** [0.18]	0.73*** [0.15]	1.00*** [0.14]	0.60*** [0.12]
β balanced panel round 6	1.58*** [0.26]	1.03*** [0.21]	0.99*** [0.17]	0.68*** [0.14]	0.77*** [0.14]	0.59*** [0.13]
Rank-rank						
rank cross section full sample round 3	0.30*** [0.03]	0.28*** [0.02]	0.20*** [0.02]	0.19*** [0.02]	0.23*** [0.02]	0.17*** [0.02]
rank balanced panel wave 3	0.35*** [0.04]	0.23*** [0.04]	0.22*** [0.03]	0.18*** [0.03]	0.22*** [0.03]	0.18*** [0.03]
rank balanced panel round 6	0.36*** [0.05]	0.23*** [0.04]	0.25*** [0.03]	0.19*** [0.03]	0.21*** [0.03]	0.20*** [0.03]
$N_{offspring}$ cross section wave 3	1299	1893	2362	2420	2364	2841
$N_{offspring}$ balanced panel	460	784	974	1112	1269	1628

Notes: first row refers to regression of offspring pension wealth on parent's wealth controlling for age within 6-year age group. Both offspring and parent wealth have been transformed using inverse hyperbolic sine transformation and elasticity computed at mean values of offspring and parent wealth as suggested by Bellemare & Wichman (2020) and standard errors adjusted accordingly. Second and third row is identical to first row except sample is based on balanced panel of individuals observed at wave 3 (2010/12) and round 6 (2016/18).

Wealth values adjusted for inflation prior to transformation and reflect 2015 prices.

Table 5 shows there is a strong link between total parental and offspring pension wealth. The estimated IWE coefficient falls for all groups, except the very youngest group, likely reflecting AE which has led to increased pension coverage among the lowest earners. AE could reduce pension wealth inequalities but only if middle and/or higher earners do not accumulate pension wealth at a faster rate over a given period, which is unlikely given the lifecycle profile of pension wealth accumulation by parental wealth background (see Appendix B for cross section differences). Indeed, comparing cohort-on-cohort estimates of the IWE suggests there is no clear evidence of an observable decline among individuals at the same age over the sample period. We note that rank estimate remains broadly stable over the sample period for most age groups despite AE, consistent with the policy affecting the extensive (enrolment) rather than intensive (contribution) margin.

Table 5 shows that by comparing cohorts at the same age except born 6 years apart, the estimates based on Rank-regression suggest parental wealth plays an increasingly important role in explaining offspring position in the pension wealth distribution. Therefore, understanding the mechanisms which drive pension wealth accumulation for the same individuals over time and for successively younger cohorts is an important area of future research if one is to understand the rapid divergence in total net wealth by family background.

Table 6: Rank estimates for financial wealth based on cross section and 6-year panel by age (inverse hyperbolic sine specifications).

Age group at wave 3 Central birth year	29-34 1979-1980	35-40 1973-1974	41-46 1967-1968	47-52 1960-1961	53-58 1954-1955	59-64 1948-1949
Rank-rank						
rank cross section full sample round 3	0.21*** [0.03]	0.24*** [0.03]	0.22*** [0.02]	0.23*** [0.02]	0.30*** [0.02]	0.26*** [0.02]
rank balanced panel wave 3	0.25*** [0.05]	0.25*** [0.04]	0.26*** [0.03]	0.21*** [0.03]	0.30*** [0.03]	0.28*** [0.03]

rank balanced panel round 6	0.22*** [0.05]	0.23*** [0.04]	0.27*** [0.03]	0.27*** [0.03]	0.30*** [0.03]	0.32*** [0.02]
$N_{offspring}$ cross section wave 3	1340	1938	2386	2442	2377	2847
$N_{offspring}$ balanced panel	460	784	974	1112	1269	1628

Notes: first row refers to regression of rank of offspring pension wealth on rank of parent's wealth controlling for age within 6-year age group. Both offspring and parent wealth have been transformed using inverse hyperbolic sine transformation and elasticity computed at mean values of offspring and parent wealth as suggested by Bellemare & Wichman (2020) and standard errors adjusted accordingly. Second and third row is identical to first row except sample is based on balanced panel of individuals observed at wave 3 (2010/12) and round 6 (2016/18). Wealth values adjusted for inflation prior to transformation and reflect 2015 prices.

We estimate only rank estimates due to non-trivial proportion of our sample reporting negative financial wealth. Whilst economically meaningful and correlated with family background, negative values imply the types of transformations used to compute the IWE are inappropriate (Ravallion, 2017; Bellemare and Wichman, 2020). Rank regression does not suffer from such issues but doesn't account for the inequality in parental and offspring financial wealth holdings. Table 6 shows a strong positive association between parental wealth and offspring total net financial wealth and the magnitude of this effect is broadly stable across time and for individuals of the same age but born six years apart.

The mechanisms by which parents influence offspring wealth outcomes is likely to differ by wealth type and we consider the relative importance of parent versus individual characteristics in explaining wealth trajectories in a later section of the paper. Taken together, the cross section and panel evidence suggest parental wealth is strongly associated with all wealth types across the lifecycle. In the case of housing in particular, from cohort-on-cohort perspective the association between parental and housing wealth has grown stronger between 2010/12 and 2016/18. In order to quantify how much stronger, we pool waves/rounds 3-6 of WAS and interact our markers of parental wealth with time dummies and age for each type of wealth. Table 7 reports the main results in alternative specifications we control for various polynomials of age, parent's wealth and time (available on request).

Table 7: Rate of change in IWE and rank between offspring (aged 29-64) and parent wealth between wave 3 (2010/12) and round 6 (2016/18) by wealth type.

Wealth type	β [σ]	$Rank$ [σ]
Total wealth		
Wave 4*Parent's wealth	0.013 [0.0109]	0.002 [0.00691]
Round 5*Parent's wealth	0.031** [0.0143]	0.013 [0.00907]
Round 6*Parent's wealth	0.039** [0.0189]	0.003 [0.0119]
Age*Parent's wealth	-0.003** [0.00120]	0.003*** [0.000709]
Parent's wealth	0.465*** [0.0278]	0.229*** [0.0145]
Property wealth		
Wave 4*Parent's wealth	0.052 [0.0389]	0.005 [0.00671]
Round 5*Parent's wealth	0.088* [0.0517]	0.0150* [0.00873]
Round 6*Parent's wealth	0.186*** [0.0677]	0.0302*** [0.0113]
Age*Parent's wealth	-0.026*** [0.00468]	0.004*** [0.000711]
Parent's wealth	1.724*** [0.112]	0.194*** [0.0148]
Pension wealth		
Wave 4*Parent's wealth	0.054 [0.0452]	0.006 [0.00810]
Round 5*Parent's wealth	0.084 [0.0568]	0.028*** [0.0103]
Round 6*Parent's wealth	0.0007 [0.0694]	0.008 [0.0129]
Age*Parent's wealth	-0.021*** [0.00463]	0.0003 [0.000779]
Parent's wealth	1.358*** [0.106]	0.181*** [0.0156]
Financial wealth		
Wave 4*Parent's wealth		0.006 [0.00865]
Round 5*Parent's wealth		-0.014 [0.0106]
Round 6*Parent's wealth		0.004 [0.0130]
Age*Parent's wealth		0.002*** [0.000765]
Parent's wealth		0.192*** [0.0165]
N_{total_wealth}	33,278	33,278

$N_{housing\_wealth}$	33,098	33,098
$N_{pension\_wealth}$	33,278	33,278
$N_{financial\_wealth}$		33,278

Notes: second and third column correspond to regression of offspring wealth (by type) on parent's total net wealth interacted with time and parent's total net wealth interacted with age, second column refers to IWE and third column rank estimate. Both regressand and regressors have been appropriately transformed using log or HIS depending on wealth type. All specifications also control for first and second order polynomial terms in age, parent's total net wealth and wave dummies (not reported). IWE estimates not reported for financial wealth due to proportion of sample reporting negative net financial wealth. Samples based on pooled data using wave 3-round 6 of WAS. Wealth values adjusted for inflation prior to transformation and reflect 2015 prices.

Table 7 shows that the rapid pace at which intergenerational wealth persistence in GB is growing stronger over time is predominantly being driven by housing wealth.[9] Row 12 (column 2) shows that the strength of this relationship has grown by 0.186 log points over a six-year period, or roughly 0.03 log points a year for an individual at the same age but born six-years later. The estimation results suggest that among younger cohorts the IWE estimate increases from roughly 1.72 to 1.91 over a six-year period. Column 3 reports rank estimates and this mirrors the results reported in Column 2. Therefore, even detracting from the extent of housing wealth inequalities (in both generations) and relying only on rank order, the data suggest parental wealth is playing an increasingly important role in explaining offspring position in the respective housing wealth distribution. In the case of pension wealth, Table 7 shows there is only limited evidence of parental wealth having growing influence on offspring pension wealth and this relationship does not hold at the end of the sample period.

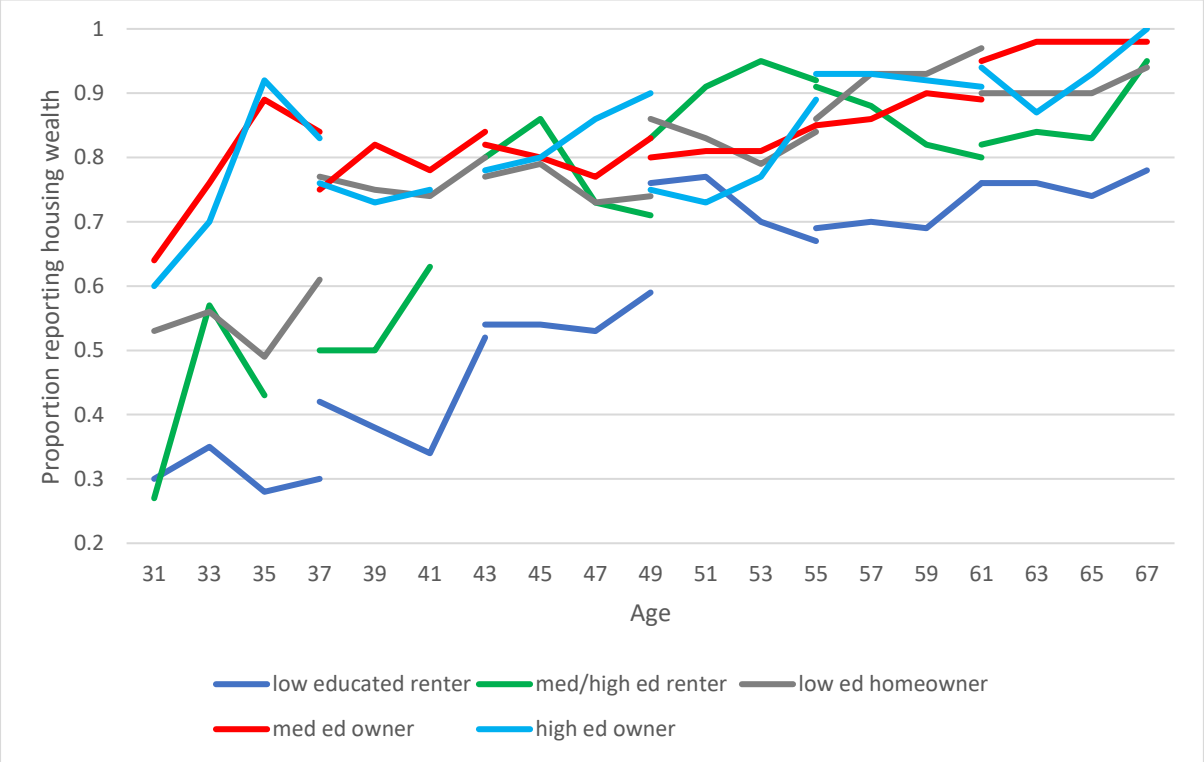
We note the interaction effect between parental wealth and age affects intergenerational persistence in wealth differently across the regression specifications. Table 7 shows that in the case of IWE-type regressions which account for level differences in wealth holdings in both the offspring and parent generation, ceteris paribus, the IWE becomes smaller with increasing age. On the other hand, when only considering the rank order and thus not accounting for inequality in wealth levels in either generation, the effect is the opposite, the joint effect is increasing in age. It is important to note the differences in the proportion of individuals who report homeownership, and conditional on reporting, the level differences in housing wealth by age group when interpreting these findings. Empirical evidence clearly shows declining homeownership and housing wealth across successively younger cohorts in GB (Resolution

[9] We do not discuss the results for total net wealth here as they reported in Gregg and Kanabar (2021).

Foundation, 2017). However, as we show in a later section of the paper this only holds for individuals from relatively less affluent backgrounds (see Figures 1 and 2). Collectively, the findings highlight both regression approaches are required to analyse and understand intergenerational persistence in wealth, specifically how the interaction between individual and parental characteristics explain the change in wealth persistence over time.

The findings in Table 7 are of policy relevance, if the change in offspring wealth inequalities is due to housing wealth and such wealth is being accumulated at different rates and this is increasingly determined by parental wealth then policymakers need to understand the mechanisms responsible for this. There are two issues to consider. First, whether the findings reported in Table 7 are due to offspring having vs not having housing wealth (so the presence of zero versus positive housing wealth), the value of such wealth and how this is related to family background. Secondly, whether the composition of total net wealth is changing across time and cohorts, for example is housing becoming an increasingly dominant component of total wealth. We explore these issues next.

Figure 1: Proportion of individuals (aged 31-67) reporting housing wealth by family background over sample period (2010/12-2016-18).



Notes: proportion corresponds to individuals reporting housing wealth by single age year, each group defined by age and parent background. Based on unbalanced panel sample minimum of one observation per individual to

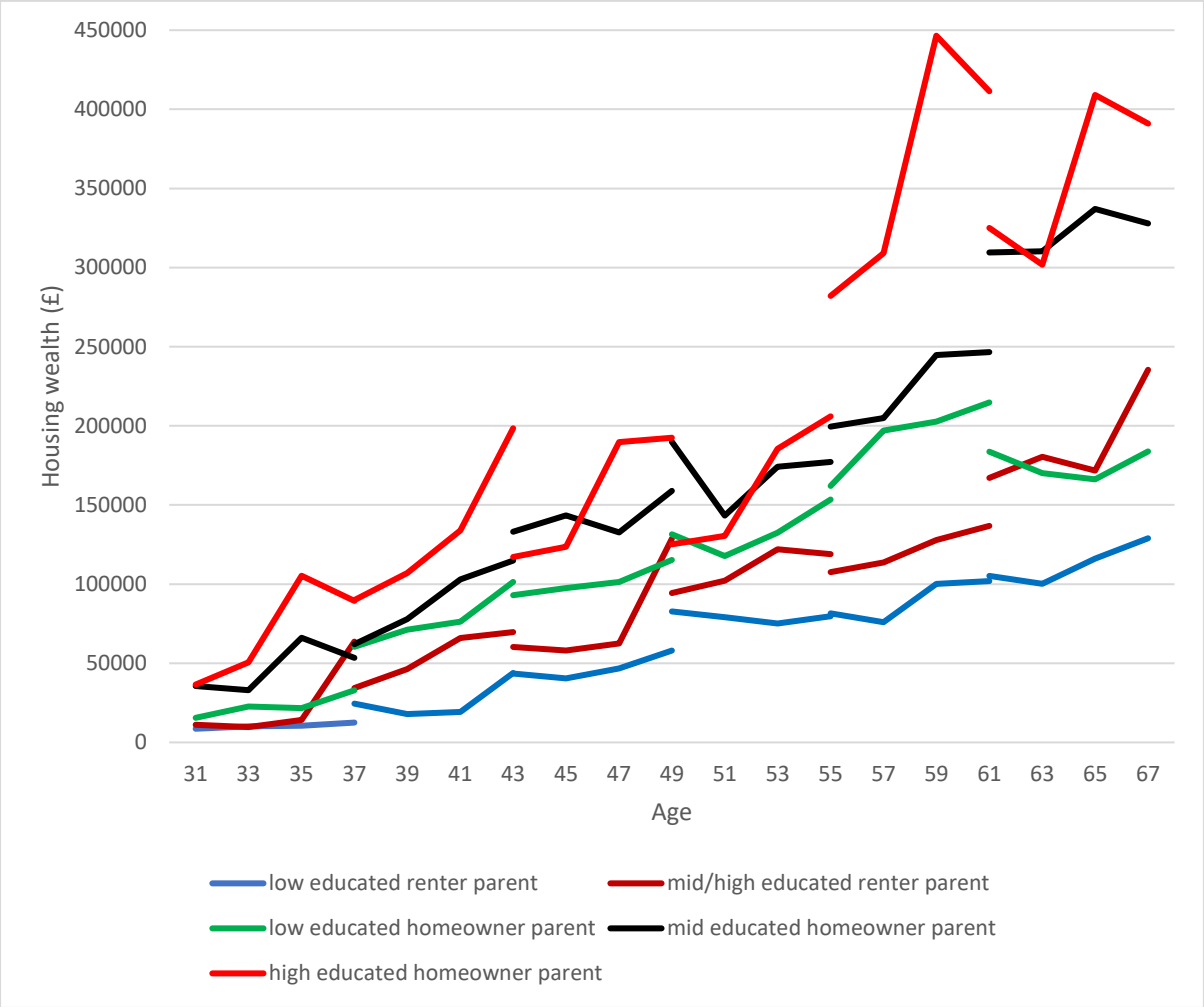
be included in sample. N=36, 384. Proportions reported over 6 years corresponding with wave 3 (2010/12)-round 6 (2016/18) of WAS.

Figure 1 shows at younger ages there is a clear difference in the proportion of individuals reporting housing wealth by family background. Between ages 31 and 37 roughly 30% of individuals from a low educated renter background report such wealth, whereas the proportion increases from around 60% at age 31 to roughly 85% by age 37 among those from a high educated homeowner background. Thus, highlighting the rapid divergence in homeownership opportunities by our markers of parental wealth. Whilst Figure 1 shows a degree of convergence at older ages this refers to different cohorts who had greater absolute housing mobility and a substantial gap of around 15-20% nevertheless remains. The findings in Figure 1 are consistent with recent evidence suggesting that for the youngest age groups home ownership opportunities are becoming increasingly unequal and stratified by family background/parental wealth (Blanden et al. (2021), Davenport et al. 2021) and based on current trends it is unlikely individuals in their born in the 1980s and onwards will experience the same homeownership opportunities as their parents.

Figure 1 suggests the gaps observed across cohorts is likely to widen further in the future. Comparing the youngest (31-37) and second youngest (37-43) cohorts clearly show individuals from the most disadvantaged backgrounds are less likely to report homeownership at the same age, no such pattern is found for the most advantaged groups. In fact, homeownership rates are *higher* based on this type of comparison: among the very youngest cohort from the most advantaged background the proportion of individuals aged 37 in round 6 (2016/18) is roughly 10% higher than the adjacent cohort from the same family background. On the other hand, for cohorts from a low educated renter background there is a clear difference for the youngest group in the opposite direction, the proportion of individuals aged 37 in round 6 (2016/18) who report housing wealth is over 10% *lower* than the next cohort from the same family background. This same pattern is not evident at older ages, although we note the most disadvantaged (those who grew up in low educated renter households) consistently report lower levels of homeownership relative to all other groups.

These findings show that even based on the short panel evidence available there is a stark difference in access to holding housing wealth. A related and important issue is to consider housing wealth accumulation in terms of level differences, we use the panel aspect of WAS to plot housing wealth trajectories by cohort and parent background

Figure 2: Average housing wealth of individuals (aged 31-67) by six-year cohort and family background over sample period (2010/12-2016-18).



Notes: Average housing wealth reported by individuals by single age year, each group defined by age and parent background. Based on unbalanced panel. Minimum of one observation per individual to be included in sample. Values correspond to 2015 prices. N=36, 384. Levels reported over 6 years correspond with wave 3 (2010/12)-round 6 (2016/18) of WAS.

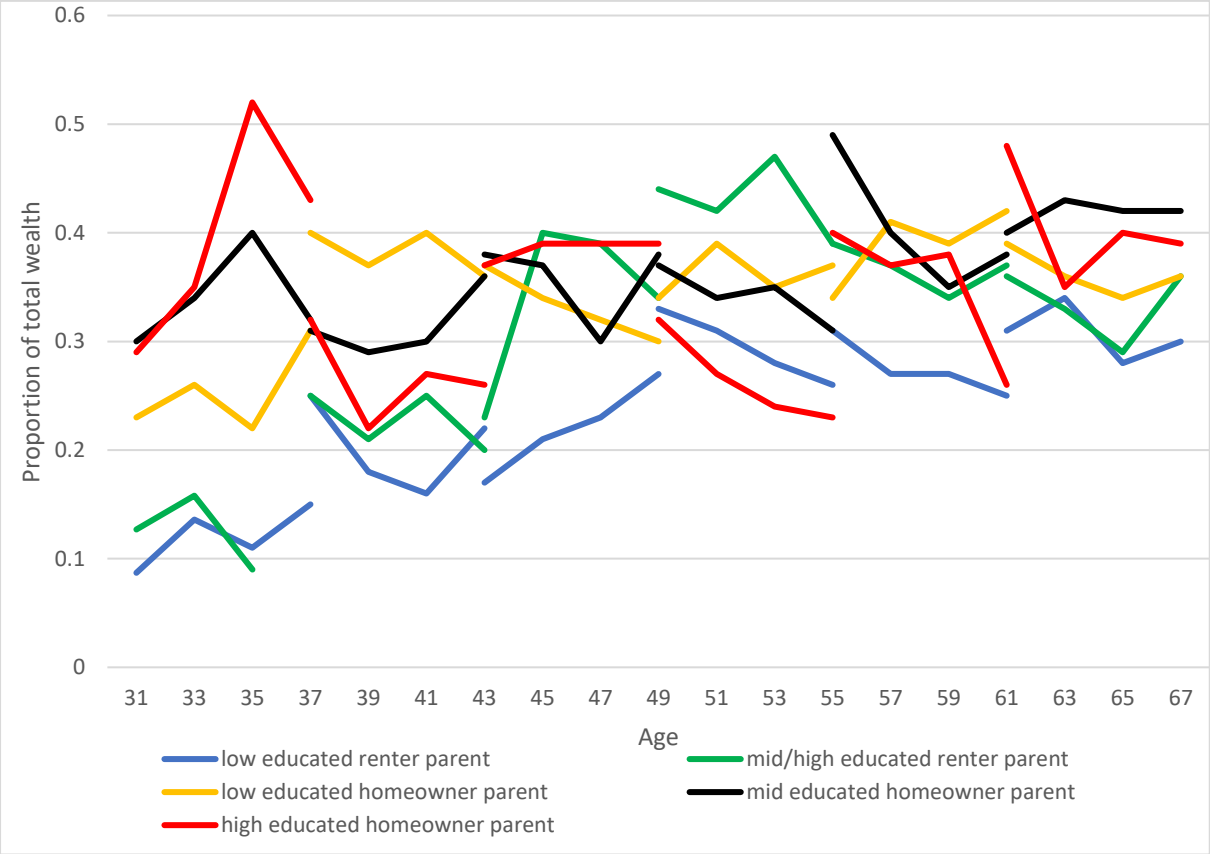
While Figure 1 showed significant differences in homeownership, Figure 2 shows differences also exist when one considers the value and rate at which housing wealth is accumulated by family background. Between age 31 and 37 average housing wealth for those from low educated renter (high educated homeowner) backgrounds increased from £10,064 (£36,546) to £12,517 (£89,359), so an average increase of £2,500 or 25% albeit from a low base. On the other hand, for those from the most advantaged background the average increase is almost three times the level reported at age 31, in absolute terms around £53,000 over 25 times the absolute gain among those from a low educated renter background over the same ages. Therefore, even

at relatively young ages there is vast inequality in housing wealth, consistent with the results in Table 4 and given the profile of housing wealth accumulation by cohorts and parental background shown in Figure 2 this difference holds across the lifecourse. These results are consistent with the findings presented in Table 7 and imply inequalities in housing wealth have been and are likely to continue driving the overall change in intergenerational wealth persistence in GB.

Comparing across the lifecycle Figure 2 shows that the average rate of housing wealth accumulation among younger cohorts (below age 50) from more disadvantaged backgrounds is lower than for older groups. This does not hold for the most advantaged group. In fact, among the two youngest cohorts in this group (age 31-43) housing wealth is accumulated at a more rapid rate compared to individuals from the same background aged between 43 and 55. We also note the sharp increase in the levels of housing wealth reported among individuals aged 55+ from the most advantaged background, which may reflect proceeds from inheritance. How such funds are used is an under researched area for example whether such monies are used to purchase additional property or, alternatively, passed on to younger generations to purchase their first home.

The findings in Figures 1 and 2 highlight that two important issues: over time and on a cohort basis, lower levels of homeownership and housing wealth (conditional on reporting homeownership) are reported among the youngest cohort of individuals who grew up in the most disadvantaged background. No such evidence is found for those from the most advantaged backgrounds, indeed if anything the evidence suggests the opposite holds true.

Figure 3: Housing wealth as a proportion of total wealth of individuals (aged 31-67) by six-year cohort and family background over sample period (2010/12-2016-18).



Notes: proportion corresponds to proportion of total wealth attributable to housing by single age year, each group defined by age and parent background. Based on unbalanced panel. Minimum of one observation per individual to be included in sample. N=36, 384. Proportions reported over 6 years corresponding with wave 3 (2010/12)-round 6 (2016/18) of WAS.

Alongside understanding the rate at which individuals accumulate certain assets by family background, we consider how much asset type contributes to overall total net wealth over time and on a cohort basis. Doing so allows us to understand whether the changes documented in Tables 4 and 7 and Figures 1 and 2, which reflect inequality in holdings and wealth levels, mean certain asset types and their value are becoming increasingly important in explaining total wealth differences between individuals from different parental wealth backgrounds. This is important from a policy perspective. For example, if pension as opposed to housing wealth is largely responsible for the overall increase in total net wealth inequality among offspring, and constitutes an ever-increasing fraction of total net wealth across successively younger cohorts, then the types of policies required to reduce wealth inequality are likely to be related to improving earnings inequality, for example early life education interventions. On the other

hand and as is the case based on our findings, if total wealth inequality from a cohort-on-cohort perspective is attributable to housing wealth, then interventions are required which facilitate improved access to homeownership *and* housing wealth accumulation especially for those from the most disadvantaged backgrounds and such interventions should be targeted at individuals during their 20s and/or 30s. Schemes such as 'Help to Buy' (HTB) which provide a government-backed equity loan were established to facilitate homeownership among younger individuals. Our sample covers a period when HTB has been in operation and the findings show homeownership and housing wealth accumulation continues to be increasingly stratified by parental wealth. Thus, whilst we do not know what the homeownership situation would have been without HTB (indeed it may well have been even worse compared to the status quo), at best current policies are insufficient.

Using WAS, we split out the contribution of housing wealth to total wealth and in Figure 3 plot this by age cohort and family background.[10] Three key findings emerge. First, at young ages housing wealth comprises a higher fraction of total wealth for those from advantaged backgrounds. This reflects both a higher proportion of this group holding such wealth and conditional on holding, the level. Appendix B details the profile of total wealth and its components based on a single cross section to highlight the overall level differences in asset holding by parental background across age. This shows the absolute levels of all wealth types are higher for those from the most advantaged backgrounds.

Second, the panel aspect of WAS allows us to document the fraction housing wealth explains of total wealth as the *same* individual ages on a cohort basis, here we again see different patterns by parent background. This also reflects differences in holding and levels: house prices in GB increased by 37% on average between 2010 and 2018 (the period spanning our sample period) and therefore homeowners over this period saw large returns on such assets albeit with significant variation by geographical region (ONS, 2021). Recent international evidence underlines the role of portfolio allocations and returns to housing as key factors explaining cross national differences in wealth inequalities (Black et al. 2020; Pfeffer and Waitkus, 2021). The recent Covid-19 pandemic has led to further sustained and significant increases in house values and thus the findings here are likely to continue to hold in the short term. It is important to note that the likelihood of homeownership varies significantly by region in GB due to heterogeneity in house prices, London and the Southeast being typically the most expensive

[10] Appendix A contains detailed information describing the components of total wealth.

areas. It is in these areas where the most affluent individuals tend to reside and is relevant when one considers the returns to housing assets and accumulation of housing wealth. A regression of region of residence and homeownership (full details available upon request) shows individuals from the most advantaged backgrounds are significantly more likely to reside in London and the Southeast at wave 3 of WAS.

Third, comparing cohorts across time Figure 3 shows that for individuals from the most disadvantaged background housing wealth comprises a lower fraction of total net wealth across successively younger cohorts. This is due to a higher proportion of this group simply not holding such wealth. The same is not true for those from relatively well-off backgrounds, here we see a relatively flat profile in terms of how much housing wealth constitutes total wealth. Over the sample period among the youngest cohort this group saw housing wealth grow as a fraction of total wealth, likely due to lifecycle effects. Consistent with this the downward trajectory observed at ages 50+ is due to pension wealth becoming increasingly important in influencing overall wealth levels. Financial wealth is also important at older ages and is highly concentrated among those from the most advantaged backgrounds. Appendix B shows pension wealth by age based on a single cross section and we find a similar pattern. Just prior to retirement at age 64, the average level of pension wealth among males who grew up in a medium/high educated homeowner (low educated renter) household at wave 3 is £444,251 (£181,668). For women the corresponding figures is £83,908 (£19,796). In addition, receipt of inheritances which affect financial wealth also explains the pattern observed among the older groups aged 50+ in Figure 3 and international survey evidence suggests the likelihood and level of receipt is highly correlated with family background (Palomino et al. 2021; OECD, 2021; Davenport et al. 2021).

Our findings underline the rapid change in homeownership and housing wealth from a cohort perspective and the findings in Table 7 suggest housing wealth is largely responsible for driving the change in the intergenerational persistence in wealth. An important issue then is to quantify how rapidly parental background is influencing homeownership opportunities across successively younger cohorts. To answer this, we interact parents total net wealth and survey wave dummies to directly compare how homeownership differs for individuals at the same age but born six-years apart.

Table 8: Likelihood of reporting housing wealth for offspring aged 29-64 and parent wealth between wave 3 and round 6 across wealth types.

	β [σ]	$Rank$ [σ]
Whether reports housing wealth		
Wave 4*Parent's wealth	0.0119 [0.0111]	0.0345 [0.0431]
Round 5*Parent's wealth	0.0119 [0.0145]	0.0312 [0.0549]
Round 6*Parent's wealth	0.0373** [0.0186]	0.126* [0.0700]
Age*Parent's wealth	-0.00387*** [0.00132]	-0.0103** [0.00481]
Parent's wealth	0.373*** [0.0287]	1.322*** [0.102]
N	33,098	

Notes: *** p<0.01, ** p<0.05, * p<0.1. Top panel refers to probit regression of whether offspring report housing wealth regressed on first and second order polynomial of age, parent's wealth (elasticity or rank), time, interaction between parents' wealth and time, interaction between parent's wealth and age. Standard errors clustered at individual level. Sample based on waves 3-round 6 of WAS (2010/12-2016/18).

Table 8 reports probit regression coefficients and shows the likelihood of reporting housing wealth is increasingly influenced by family background for individuals at the same age but born 6 years apart. Estimating this relationship using beta and rank regressions allows us to incorporate inequality in parental wealth levels in explaining the variation in offspring homeownership, whereas the rank regression highlights how parents' position in the parental wealth distribution rather than the magnitude of parental wealth differences is important and the coefficient estimates do not suffer from bias issues discussed in section 3. The magnitude of the effect estimated (relative to the base group) suggests the likelihood of reporting housing wealth is 0.037 log points higher among individuals born 6 years later to the same parental background, and 0.126 in rank terms by round 6 (2016/18) both significant at conventional levels. Thus, parental wealth irrespective of regression approach is playing an increasingly important role in explaining the likelihood of whether offspring are likely to report homeownership. Table 7 shows this finding holds when we consider offspring housing wealth inequality i.e., conditional on having housing wealth. The sixth row of Table 8 highlights the negative relationship between age and family background in affecting the likelihood of reporting housing wealth, consistent with recent evidence underlining the difficulty for younger cohorts in GB to get on the housing ladder (Resolution Foundation, 2018). Taken together, the

evidence presented in Tables 7 and 8 suggests rapidly diverging fortunes in homeownership and housing wealth by parent background between 2010 and 2018.

The ability to purchase a home is related to both individual and parental characteristics. To understand the relative importance of parental background we estimate a regression which also includes controls for individuals *own* education, earnings, social class, economic status, marital status, sex and region. [11] These have been shown to be important in explaining homeownership from an intergenerational perspective in GB (Blanden et al. 2021; Davenport et al. 2021). Our interest is to understand the additional importance of family background over time and across cohorts, once we control for such characteristics. Full results which can be found in Appendix D show that even after controlling for these additional factors our qualitative findings do not change from those reported in Table 8. In fact, the coefficient estimated on the interaction effect between time and parental wealth by the end of our sample period is even *larger* (0.055** [0.027] in the case of the beta regression) implying a joint positive correlation between individuals own and their parent's characteristics and collectively their influence on the relative likelihood of reporting homeownership.

We also regress the same set of individual and parental characteristics on value of offspring housing wealth and also find a strong positive association between parental wealth and the interaction between time dummies and parental wealth with offspring housing wealth. The latter becoming stronger over time (significant at conventional levels for beta and rank regressions). Therefore parental wealth is becoming more important for determining homeownership *and* the level of housing wealth among individuals born to the same parental background but born 6 years apart, consistent with the results in Table 7.

5. Conclusion

Great Britain like many advanced economies has seen a rapid widening in wealth inequalities from a cohort perspective (Boserup, 2017; Black et al. 2020, Gregg and Kanabar, 2021). The fact wealth significantly affects an individual's living standards and is easily transferable implies that inequalities early in life will have profound implications over time, such as influencing major lifecycle events including homeownership. Therefore understanding which components of wealth drive wealth persistence from an intergenerational perspective is of paramount importance if policymakers are to design effective policies to improve wealth and

[11] Adding individual levels controls to the regression will bias down the effect of parental wealth on offspring wealth.

social mobility. To our knowledge no studies have attempted to understand the relative importance of different wealth *types* in driving intergenerational wealth persistence, something we address in this paper. We show that in the case of GB the change is largely attributable to growing inequalities in housing wealth and this is becoming increasingly stratified by parental wealth. Over a six-year period (2010/12-2016/18) we estimate parental wealth increases the IWE in housing by 0.18 log points and if maintained implies the IWE in housing will double in roughly one century.

A second major finding is that across successively younger cohorts homeownership and housing wealth accumulation is becoming increasingly associated with parental wealth. Cohort analysis shows that among younger individuals in their early 30s from the wealthiest backgrounds housing wealth is being accumulated at a similar or even *faster* rate than older cohorts. On the other hand, individuals from the most disadvantaged backgrounds in their early 30s are not only *less* likely to report homeownership compared to slightly older cohorts but the rate at which housing wealth is being accumulated is also falling compared to individuals from the same parental background but who are slightly older. By age 35 homeownership levels are *three* times higher among offspring whose parents are high educated homeowners compared to those whose parents are from a low educated renter background, and in terms of housing wealth the former group holds approximately *ten*-times the level of housing wealth compared to the latter. Such differences in housing wealth between the most and least advantaged persist between ages 30 and 64 and are set to widen further. Importantly, we show that our findings hold even after controlling for a range of individual characteristics which are likely to influence homeownership such as earnings and education.

Taken together the results imply the penalty for being born to parents of low wealth is growing rapidly over time in GB and is influencing major lifecycle decisions such as the ability to own a home and accumulate housing wealth. Such findings have implications for the structure of society in the long run and raise serious political economy questions related to social cohesion and civic participation. Indeed, the historic returns from wealth versus human capital and its implication for individual social mobility has garnered international debate in recent times (Piketty, 2017). In the context of our study the returns to housing are non-trivial, over our sample period (2010 and 2018) average house prices in GB grew by over 37% and by over 11% in the year to September 2021 alone (ONS, 2021). Despite policies targeted at young people to improve access to homeownership in the UK such as Help to Buy, our findings suggest parental wealth influences the likelihood of homeownership and the strength of this

relationship is *growing* over time. A key question then is to understand whether the relative importance of individual versus parent characteristics, including transfers, is changing over time and driving wealth inequalities. In addition, we need a better understanding of household level wealth dynamics across cohorts and over time, a focus of ongoing research.

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Appendix

Appendix A: Definition of derived variables used from Wealth and Assets Survey

Table A1: Definition of derived variables.

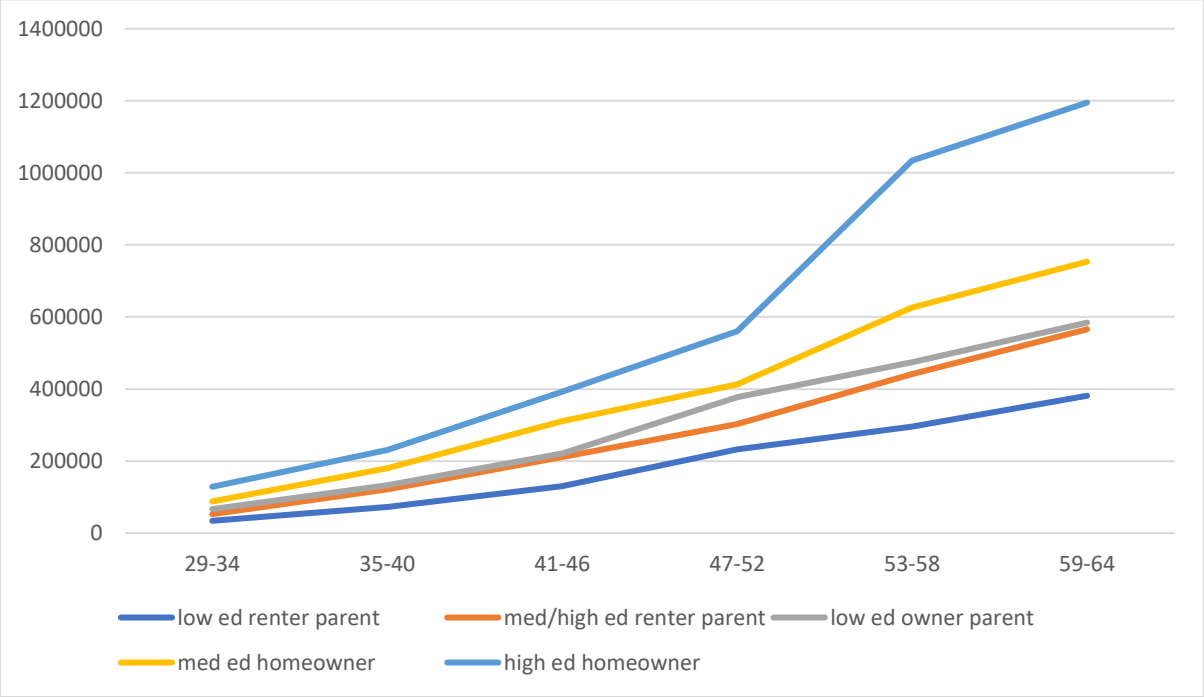
Variable	Definition
Total net wealth	Total sum of: Individual net value of all (main and other) property, individual net financial wealth (includes endowment), individual physical wealth (including durable goods) and individual pension wealth.
Pension wealth	Total sum of occupational Defined Benefit (DB), occupational Defined Contribution, retained rights in DB schemes, retained rights in DC schemes, value of additional voluntary contributions (AVCs), value of personal pensions, value of retained rights in defined benefit pensions, value of retained rights in defined contribution pensions, value of retained rights in drawdown, value of pensions in payment and value of pension from former spouse of partner.
Net property wealth	Individual net value of all (main and other) property
Net financial wealth	Total value of all formal assets (current account, savings, ISAs, national savings product, shares, insurance, bonds, employee

	shares, unit and investment trusts, overseas shares, bonds/gilts (home and abroad), any other investments) PLUS total value of informational assets PLUS child trust funds, other children's assets, endowments. MINUS Total financial liabilities (total credit card balance, total value of store cards, mail order, hire purchase, total amount of all loans, mail order arrears, hire purchase arrears, loan arrears, total bill arrears, current account overdraft, total value of student loans).
Proportion reporting housing wealth	Proportion of individuals in sample who report having a strictly positive amount of net housing wealth.
Proportion with pension wealth	Proportion of individuals in sample who report having a strictly positive amount of pension wealth.
Proportion with financial wealth	Proportion of individuals in sample who report having a strictly positive amount of financial wealth.

Appendix B: Wealth type and parent background

Figure B1 plots total net wealth by age in wave 3 (2010-2012) of WAS. There are clear level differences and a general pattern of fanning out across the lifecourse by parental wealth background. Those from medium and high educated homeowner backgrounds steadily pull away from other groups. In particular, the latter group sees a rapid increase in wealth levels in their 50s and 60s. By the time individuals reach peak wealth age, around 64 in our data, those from high educated homeowner background report on average three times the amount of wealth (£1.2M vs £400,000) relative to individuals from a low educated renter background. What is striking is that based on this simple cross section average wealth levels among those aged 41-46 from the most advantaged background equals peak wealth (at age 64) from the most disadvantaged background. For the former group this is before the arrival of pension wealth and inheritance which typically takes place when individuals are in their 50s. However, Figure B1 reports average wealth based on different individuals at one point in time, hence compares individuals across age groups with slightly older parents. Thus, the differences could reflect cohort specific factors as well as stage in the lifecycle. For a full discussion of total net wealth from a cross section perspective see Gregg and Kanabar (2021).

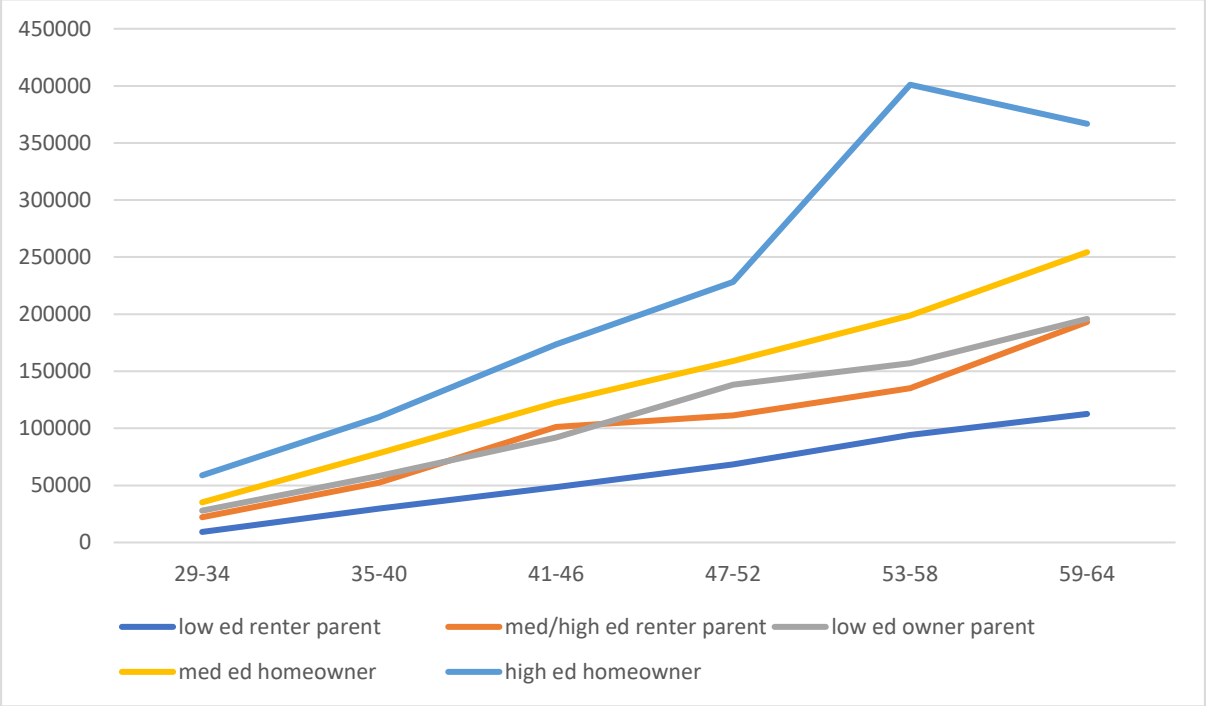
Figure B1: Total wealth by parent background



Notes: figures based on wave 3 (2010-12) of WAS. Figures correspond to 2015 prices.

We produce similar Figures for individual's total levels of (net) housing, pensions and financial wealth and find a similar trend in terms of parental wealth as we did for individual total net wealth. Figure B2 shows that individuals aged between 41 and 46 in wave 3 from a high educated homeowner background had on average similar levels of total net housing wealth as an individual at peak wealth in their early 60s from a low educated renter household. Moreover, the average levels of net housing wealth reported among the former group increases rapidly across individuals aged in their 50s, from 228K to 400K, so almost doubling. Whereas for individuals from a low educated renter background it increased from 68K to 94K. Again, it is important to stress we are not observing individuals own trajectories over time but average levels across different individuals with successively older parents. By the time individuals reach peak wealth age in our dataset, average total net housing wealth is three times greater among individuals from high educated homeowner backgrounds versus those who grew up in a low educated renter household. Whilst Figures B1-B3 include those without housing wealth (zeros), what these figures does not show is the proportion of individuals who report vs do not report housing wealth by age and parent background. This is an important distinction which we discuss in the paper.

Figure B2: Total net housing wealth by parental background



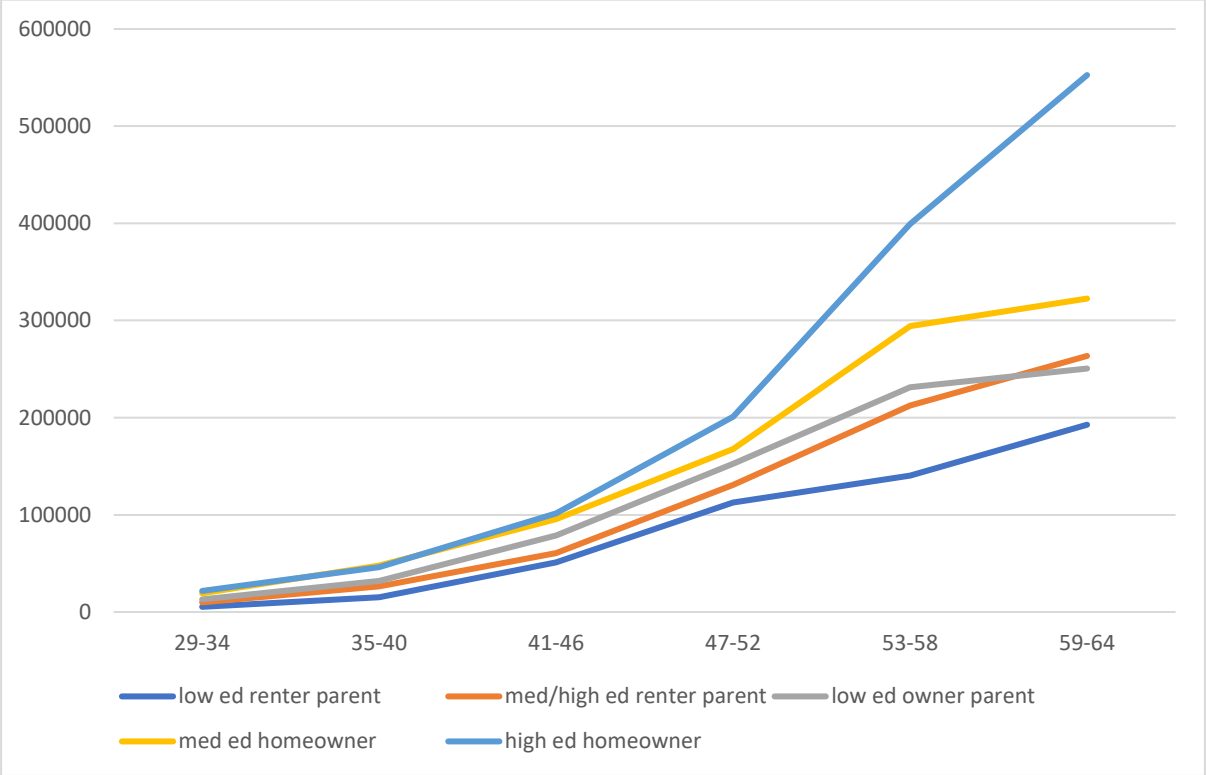
Notes: figures based on wave 3 (2010-12) of WAS. Figures correspond to 2015 prices. Includes zeros.

We next turn to pension wealth, here again we see a clear difference in pension wealth by parent background. Given its close link with earnings and how it is accumulated it is not surprising to see that differences emerge when individuals are in their 50s.[12] It is clear individuals whose parents are high educated and homeowners report high levels of pension wealth relative to all other groups. Similar to the finding for housing wealth, individuals in this group report average pension wealth at age 50 which corresponds to the average pension wealth reached by those from low educated renter backgrounds at peak wealth age. Thus, given the evidence seen in Figure B3 this is *before* the rapid increase (based on a cross section perspective so different individuals) the former group reports in their pension wealth. The absolute difference in levels is large: by early-mid 40s the difference between top and bottom group is roughly two-fold. By the time individuals reach their mid-50s it is roughly three-fold and the absolute difference just prior to retirement between these groups is vast: £552,000 vs £192,000 (in 2015 prices).

There are certain issues which should be considered when interpreting the findings in Figure B3. First, like housing wealth it is important to distinguish between having and not having pension wealth by age and parent background. The second is that the introduction of Auto Enrolment (AE) into a workplace pension took place in the UK starting in October 2012. Whilst this policy is likely to address the issue of not having pension wealth and possibly affect pension level, the initial roll out of the policy focused on coverage with relatively low levels of individual contribution. Moreover, AE is unlikely to address pension wealth gaps for individuals in their 50s given their stage in the lifecycle and the fact pension wealth is closely linked to lifetime earnings. Moreover, it is not entirely clear whether AE will address the vast differences in pension wealth by family background even for those just entering the labour market. For example, if we produce the same chart as Figure B3 but instead use round 6 data covering the period 2016-2018, a time period when the policy had been rolled out more extensively we still see the same trends as reported in Figure B3.

[12] In the UK pension wealth is accessible typically from mid 50s though there is significant heterogeneity in pension scheme eligibility rules including age of receipt.

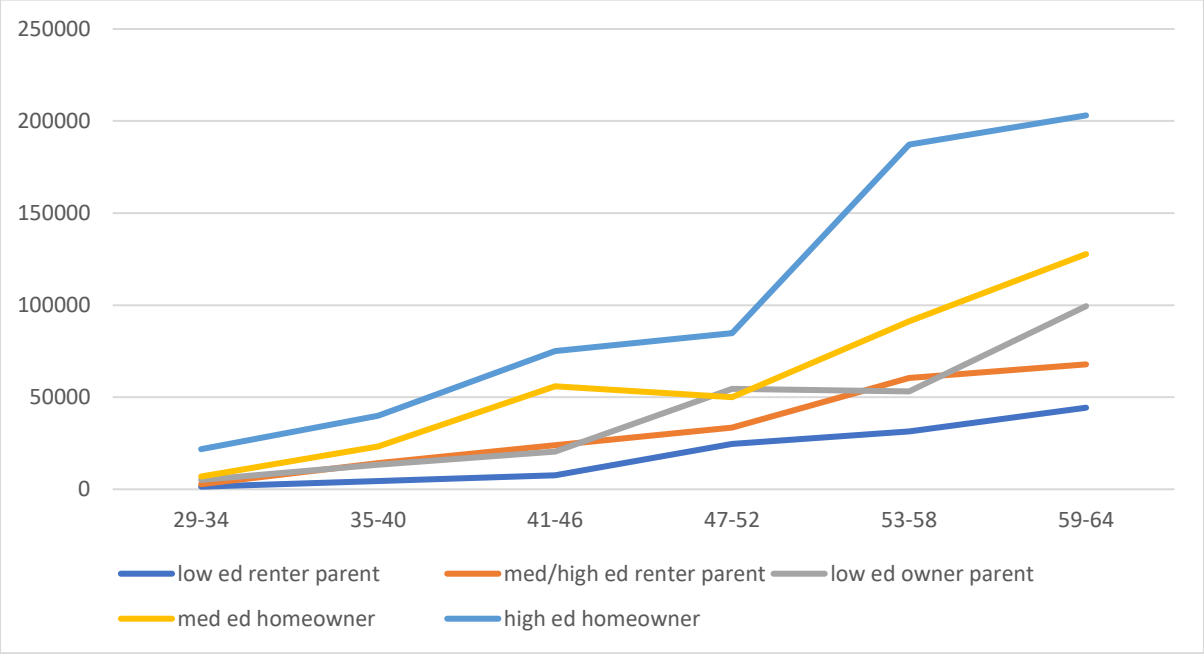
Figure B3: Total pension wealth by parental background



Notes: figures based on wave 3 (2010-12) of WAS. Figures correspond to 2015 prices. Includes zeros.

The final component of wealth we consider is financial wealth. Evidence suggests this type of wealth is concentrated in the top three deciles of the household wealth distribution in GB (ONS, 2019). Again, similar to property and pension wealth Figure B4 shows clear level differences which fan out across age groups and by parent background. Individuals from high educated homeowner households report significantly higher levels of financial wealth, roughly four-times the average level of financial wealth compared to those who grew up in low educated renter households at ages 29-34. The former group (as well as those from medium educated homeowner backgrounds) steadily pull away across age groups and Figure B4 shows a sharp increase in financial wealth levels for those in their 50s. This could reflect inheritances and transfers or stage in lifecycle, note here we are comparing different individuals at a single point in time and not accumulation by the same individuals. Just prior to retirement the average level of financial wealth for individuals from high educated homeowner (low educated renter) households is £203,060 (£44,302) an almost five-fold difference.

Figure B4: Total financial wealth by parent background



Notes: figures based on wave 3 (2010-12) of WAS. Figures correspond to 2015 prices. Includes zeros and negative values.

Appendix C: Likelihood offspring reporting wealth type by parental wealth

Table C1: Likelihood of having positive level of net wealth type by parent's wealth

Age group	29-34 1979-1980	35-40 1973-1974	41-46 1967-1968	47-52 1960-1961	53-58 1954-1955	59-64 1948-1949
Wave 3						
Housing wealth	0.61*** [0.07]	0.54*** [0.05]	0.44*** [0.05]	0.47*** [0.05]	0.52*** [0.05]	0.42*** [0.05]
Pension wealth	0.54*** [0.06]	0.49*** [0.05]	0.38*** [0.05]	0.34*** [0.05]	0.43*** [0.05]	0.19*** [0.04]
Financial wealth	0.79*** [0.18]	0.69*** [0.21]	0.81*** [0.21]	0.55*** [0.21]	0.68*** [0.18]	0.24*** [0.22]
$N_{housing}$	1298	1902	2359	2425	2374	2846
$N_{pension}$	1340	1938	2386	2442	2377	2847
$N_{financial}$	828	1126	1730	1915	1980	2179
Wave 6						
Housing wealth	0.33*** [0.62]	0.78*** [0.10]	0.59*** [0.09]	0.49*** [0.07]	0.54*** [0.07]	0.63*** [0.08]
Pension wealth	0.32*** [0.16]	0.52*** [0.10]	0.48*** [0.09]	0.41*** [0.08]	0.33*** [0.08]	0.31*** [0.07]
Financial wealth	0.07 [0.15]	0.14 [0.09]	0.30*** [0.08]	0.20*** [0.07]	0.36*** [0.07]	0.27*** [0.08]
$N_{housing}$	240	575	898	1107	1269	1382
$N_{pension}$	242	579	899	1110	1270	1383
$N_{financial}$	242	579	899	1110	1270	1383

Notes: logit regression modelling likelihood of holding wealth type controlling for age and parent's wealth (measured in log). Wave 3 corresponds to (2010-12) and wave 6 (2016-18). Robust standard errors reported in parenthesis.

Table C1 shows that the likelihood of holding wealth is strongly associated with family background. This holds across almost all age groups and wealth types. Whilst the results based on wave 3 (2010-12) data suggest the strength of this association is growing across successively younger cohorts, this does not hold at round 6 (2016-18) where the strength of the relationship is stable.

Appendix D: Homeownership, parental wealth and individual characteristics

Table D1: Regression of whether individual holds property wealth and housing value for beta and rank specifications.

	Dependent variable: has property wealth		Dependent variable: housing value	
Covariates	$\beta(\sigma)$	$rank(\sigma)$	$\beta(\sigma)$	$rank(\sigma)$
Age	0.0780***	0.0559***	0.485***	0.0126***
	(0.0245)	(0.00819)	(0.0682)	(0.000988)
Age square	-0.000358**	-0.000378**	-0.00246***	-8.61e-05***
	(0.000173)	(0.000175)	(0.000467)	(2.19e-05)
Parent's wealth/rank	0.215***	0.717***	0.926***	0.0400**
	(0.0365)	(0.130)	(0.115)	(0.0159)
Wave 4	-0.277	-0.0837*	-0.932	-0.0469***
	(0.242)	(0.0427)	(0.631)	(0.00540)
Wave 5	-0.467	-0.176***	-2.991***	-0.0815***
	(0.293)	(0.0531)	(0.804)	(0.00696)
Wave 6	-0.858**	-0.250***	-3.901***	-0.113***
	(0.351)	(0.0639)	(0.987)	(0.00845)
Wave 4* Parent's wealth/rank	0.0161	0.0166	0.0492	0.0115
	(0.0193)	(0.0736)	(0.0493)	(0.00845)
Wave 5* Parent's wealth/rank	0.0268	0.0806	0.206***	0.0379***
	(0.0233)	(0.0875)	(0.0627)	(0.0107)
Wave 6* Parent's wealth/rank	0.0556**	0.161	0.271***	0.0447***
	(0.0279)	(0.105)	(0.0766)	(0.0129)
Age* Parent's wealth/rank	-0.00197	-0.00329	-0.0195***	0.00436***
	(0.00177)	(0.00656)	(0.00490)	(0.000768)
Unemployed	0.417**	0.410**	0.215	0.0503**
	(0.173)	(0.174)	(0.477)	(0.0235)
Inactive	0.525***	0.524***	0.776***	0.0621***
	(0.136)	(0.136)	(0.292)	(0.0161)
Cohabiting (inc same sex couples)	-0.465***	-0.462***	-1.201***	-0.0292***
	(0.0500)	(0.0499)	(0.152)	(0.00703)
Single	-0.970***	-0.971***	-2.948***	-0.0461***
	(0.0463)	(0.0462)	(0.174)	(0.00798)
Widowed	-0.577***	-0.576***	-1.192***	0.0527**
	(0.121)	(0.121)	(0.427)	(0.0219)
Separated/divorced	-0.868***	-0.869***	-2.428***	-0.0490***
	(0.0498)	(0.0498)	(0.182)	(0.00872)
Other qual (below degree level)	-0.323***	-0.305***	-0.851***	-0.0713***
	(0.0404)	(0.0405)	(0.0841)	(0.00499)
No qualification	-0.634***	-0.614***	-1.973***	-0.109***
	(0.0518)	(0.0520)	(0.149)	(0.00729)
North West	-0.190**	-0.195**	-0.305	0.0122
	(0.0866)	(0.0862)	(0.223)	(0.00988)

Yorkshire and The Humberside	0.0614	0.0634	0.299	0.0373***
	(0.0917)	(0.0913)	(0.224)	(0.00994)
East Midlands	-0.124	-0.126	-0.122	0.0286***
	(0.0904)	(0.0900)	(0.229)	(0.0104)
West Midlands	-0.0288	-0.0279	0.128	0.0501***
	(0.0915)	(0.0910)	(0.229)	(0.0105)
East of England	-0.158*	-0.166*	0.0876	0.0945***
	(0.0906)	(0.0902)	(0.229)	(0.0107)
London	-0.382***	-0.396***	-0.104	0.157***
	(0.0948)	(0.0944)	(0.256)	(0.0128)
South East	-0.175**	-0.186**	0.169	0.129***
	(0.0866)	(0.0863)	(0.215)	(0.0101)
South West	-0.133	-0.141	0.104	0.0826***
	(0.0949)	(0.0945)	(0.239)	(0.0114)
Wales	-0.0356	-0.0353	0.145	0.0403***
	(0.103)	(0.103)	(0.256)	(0.0120)
Scotland	-0.0646	-0.0804	0.0602	0.0267***
	(0.0892)	(0.0888)	(0.227)	(0.00997)
Intermediate occupation	-0.183***	-0.180***	-0.417***	-0.0218***
	(0.0419)	(0.0419)	(0.100)	(0.00545)
Routine manual occupation	-0.590***	-0.588***	-1.975***	-0.113***
	(0.0385)	(0.0385)	(0.110)	(0.00529)
Never worked & LT unemployed	-0.975***	-0.959***	-3.789***	-0.158***
	(0.123)	(0.123)	(0.407)	(0.0176)
Not classified	-0.567***	-0.570***	-1.712***	-0.0722***
	(0.120)	(0.121)	(0.412)	(0.0196)
Net earnings (all jobs, annual)	0.100***	0.100***	0.213***	0.00903***
	(0.0130)	(0.0131)	(0.0255)	(0.00148)
Female	-0.0310	-0.0338	-0.0664	-0.000107
	(0.0341)	(0.0341)	(0.0855)	(0.00441)
Constant	-2.574***	-0.286	-5.228***	0.194***
	(0.501)	(0.189)	(1.546)	(0.0219)
Observations	23,140	23,140	23,140	23,140

Notes: regression specification identical to Table 7 except additional offspring characteristics controlled for. Base groups: wave 3, employed, married/civil partnership, degree, North East, professional occupation and male. Net earnings transformed using inverse hyperbolic sine, adjusted for inflation and correspond to 2015 prices.