The Impact of Fathers' Job Loss during the Recession of the 1980s on their Children's Educational Attainment and Labour Market Outcomes*

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Abstract

The research on intergenerational correlations in outcomes is increasingly moving from measurement into assessment of causal transmission mechanisms. This paper analyses the causal impact of fathers' job loss on their children's educational attainment and later economic outcomes. To do so, we isolate the effect of job loss associated with major industry contractions, mainly in manufacturing, during the recession of the 1980s by mapping industry-level employment change data from 1980 to 1983 into the British Cohort Study (BCS). Children with fathers who were identified as being displaced did significantly worse in terms of their GCSE attainment than those with non-displaced fathers. A child with a displaced father obtained, on average, 18 grade points lower or half a GCSE at grades A*–C less than their otherwise-identical counterparts, the equivalent of about 2 per cent lower wages as an adult. There is also a small effect of fathers'

displacement on the early labour market attachment of children, but no direct impact on their earnings at age 30/34. This does not mean that the impact of job loss will not affect social mobility. Those with lower income, education and social class were most affected by job losses and there is a direct effect on education and youth unemployment, which we know to be drivers of later earnings. This suggests that the recent recession may have significant long-term consequences for the children of those who have lost their jobs.

Policy points

- Fathers' job loss during recessions impacts the educational attainment and early labour market experiences of their children. This has long-term consequences for social mobility as those fathers who are displaced in recessions are more likely to come from low-income families.
- The research suggests that policies that encourage firms to keep hold of workers during recessions may reduce the impact on the next generation.

I. Introduction

The impact of job loss for an individual has been shown to be long-lasting, with lower future employment and wage scars persisting for decades.[1] More recently, research has considered the impact of parental job loss on child outcomes,[2] assessing whether parental job loss also leaves scars on the next generation. This is part of a rapidly growing literature seeking to isolate the causal transmission mechanisms underlying the intergenerational correlation in economic outcomes.[3] In this vein, this research considers the impact of job loss of fathers in the UK during the recession of the 1980s on the educational outcomes and later labour market experiences of their children who were going through early adolescence at the time of the employment shock. Previous evidence on patterns of social mobility in the UK has found that for the British Cohort Study (BCS), the persistence in incomes across generations was higher than that found for an earlier cohort born in 1958. Decomposing intergenerational income persistence across the two birth cohort studies suggests that education is a main driver of this persistence in the UK and that an increasing relationship between family income and educational attainment looks to have driven the increase in persistence across time.[4] Therefore any direct effect of fathers' job loss on their children's educational attainment and later labour market outcomes could be part of this story. At a time of rising unemployment, the impact of job loss

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[1]Stevens, 1997; Gregg, 2001; Gregg and Tominey, 2005; Davis and von Wachter, 2011.
[2]Oreopoulos, Page and Stevens, 2008; Stevens and Schaller, 2009.
[3]See Black and Devereux (2011).
[4]Blanden, Gregg and Macmillan, 2007.

during a recession on the outcomes of the next generation is once again highly topical.

The recession of the 1980s was deep and drawn out and had a large lingering effect on employment in the UK. The Conservatives came into power in 1979 with inflation at approximately 8 per cent and increasing as a result of the combined effect of a second oil price shock and the implementation of a decision by the incoming government to double the rate of VAT. The government adopted a strict monetarist approach, raising interest rates, reducing the budget deficit and introducing money supply targets. Aggregate demand fell significantly in the early 1980s, with real GDP falling by 6 per cent over 24 months. Inflation was eventually brought under control by 1983 but unemployment rose to 12 per cent (3 million) and stayed around this level until 1986. This sustained employment shock disproportionately hit certain industries. A shift to monetary policy as a focus for controlling inflation led to very high interest rates and a major upward revaluation of sterling. This led to the closure of a swathe of the UK's manufacturing plants, and manufacturing output shrank by almost a third. This widespread closure of industry, in turn, led to mass displacement of many low-skilled, but not especially low-paid, male workers in these industries. The timing of this recession falls in line with the adolescent years of one of our national birth cohort studies, the British Cohort Study (BCS) of all individuals born in one week in April 1970. At the time of the 1980s recession, the cohort members were 11 to 13 years old; high-quality data are available on the children's educational attainment at ages 10 and 16, either side of the recession, and on their later labour market outcomes.

The BCS does not provide complete work histories of the father over this period or have a specific question about job displacement. Instead, we match in employment changes by industry from the *Employment Gazette* to identify fathers of BCS cohort members who were working in 'hit' industries at the time of the 1980s recession. We combine this information with the father's observed industry and employment status six years later to define a group of fathers who were likely displaced as an effect of the large industry employment shock of the early 1980s. We argue that fathers leaving jobs, to move either to a new industry or out of employment, from rapidly contracting industries during a deep recession are those who were most likely to be displaced due to the exogenous shock of the recession. This is analogous to exploring job displacement for known plant closures[5] as the recession provides an exogenous shock to employment. We assess the impact of this job loss on the educational attainment of the child at age 16, their early labour market experiences and their labour market earnings at age 30/34, discussing the size of the role of a decrease in economic resources in any impact found. Given that our measure of displacement remains

[5]Oreopoulos, Page and Stevens, 2008.

imperfect, we assess the role of selection by running a placebo test on the impact of our measured displacement on child attainment in a pre-recession period. We find no evidence of selection into the displaced category in terms of prior child attainment. This supports our claim that we are measuring exogenous job displacement. Any remaining measurement error in our displacement measure will result in attenuation bias in our results and therefore the effect we find of involuntary job loss for fathers on their children's later outcomes should be considered a lower bound estimate.

In the next section, we review the previous work that has considered the impact of job loss on outcomes both within generations and across generations for the children of those experiencing the job loss. In Section III, we detail our estimation procedure for assessing the likely impact of job loss on the educational attainment of the child, before describing the data used in Section IV. Section V presents our main findings and robustness checks, whilst we offer some brief conclusions in Section VI.

II. Background literature

There is a large literature on the impact of job loss on people's working lives and well-being. The documented impact covers contemporaneous earnings,[6] longer-term unemployment and earnings[7] and well-being.[8] However, the literature on the intergenerational impact of job loss is less extensive.

Oreopoulos, Page and Stevens (2008) use variation induced by firm closures to explore the intergenerational effects of worker displacement. They use a Canadian panel of administrative data, following almost 60,000 father–child pairs from 1978 to 1999. The authors construct treatment and control groups of displaced and non-displaced fathers with similar pre-1982 permanent income. Displacement is defined by a vector of dummy variables indicating that a displacement has taken or will take place in a previous, current or future year, based on observable firm closures. The data also provide a post-displacement period of at least eight years. The vector of dummy variables is designed to capture wage effects prior to displacement (for future displacement), immediate displacement effects (for current displacement) and any persistence in displacement effects (for previous displacement). The authors first demonstrate that displacement leads to a large permanent reduction (14 per cent on average) in family income. They go on to show, through a reduced-form regression of displacement on child outcomes, that individuals whose father experienced an unemployment shock had annual earnings that were on average 9 per cent lower than those of individuals whose father had not experienced an unemployment shock.

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[6]Farber, 1997; Kuhn, 2002; Nickell, Jones and Quintini, 2002.
[7]Stevens, 1997; Gregg, 2001; Gregg and Tominey, 2005.
[8]Clark and Oswald, 1994; Clark, 2003.

They were also more likely to receive unemployment insurance and social assistance. The estimates are driven by the experiences of children whose family income was at the bottom of the income distribution. The authors conclude that there are long-term impacts of unexpected job displacement that extend beyond the effect within one generation to the later labour market outcomes of the next generation. It is suggested that long-term reductions in family income in childhood can substantially impact the earnings of the next generation in adulthood, indicating that the intergenerational transmission of incomes may be causal.

Bratberg, Nilsen and Vaage (2007) use matched employer–employee data from Norway to analyse the effects of worker displacement in 1986–87 on their children's earnings in 1999–2001. As in Oreopoulos et al. (2008), the authors directly observe displacement and treat this displacement as an exogenous shock to family income. They argue therefore that if this shock affects the children of those displaced, it is evidence that economic resources have a direct effect on children's economic outcomes. The authors first compare the earnings trajectories of displaced and non-displaced workers to ensure that selection is not determining the post-displacement outcomes for the children. They find, in line with the scarring literature discussed above, that displacement is followed by a reduction in earnings and unstable employment. The second step of the analysis involves a reduced-form regression of child earnings on father earnings and an indicator for father's displacement. The authors find no significant effects of fathers' displacement on the earnings of their offspring, although they find evidence to suggest that the educational outcomes of the children are negatively affected. The use of individual labour market information in defining an indicator for displacement in both of these papers most closely mirrors the methodology used in this paper, although the exact characterisation of displacement differs.

Rege, Telle and Votruba (2007) also use Norwegian data to estimate how children's school performance is affected by their parents' exposure to plant closure. In contrast to the papers mentioned previously and the empirical strategy used in this paper, Rege et al. proxy father displacement with the closure of the father's plant rather than the father's own labour market status. In their analysis, they treat plant closures as exogenous, independent of unobservable determinants of school performance, and they address any potential selection biases by including industry, municipality and school fixed effects. The authors run a reduced-form regression of displacement on educational attainment and find that fathers' exposure to plant closure leads to a substantial decline in children's graduation-year grade point average, but only in municipalities with mediocre-performing job markets. Interestingly, they also find that this negative effect does not appear to be driven by a reduction in father's income and employment, an increase in parental

divorce or the trauma of relocating. The authors thus argue that their findings are consistent with sociological 'role theories', with parents unable to fully shield their children from the stress caused by threats to the father's traditional role as breadwinner.

As we are focusing here on the impact of job loss during a recession, it is important to consider any likely direct effect of limited job opportunities on the children who will enter a similar labour market. For example, a recession may also impact directly on children's expectations and potentially their educational investments, including their effort in school. If the fact that the children observe a weaker labour market leads to worse outcomes through a dampening of expectations, then any negative impact of job displacement could be attributable to this effect rather than to the father's job loss. The evidence suggests, however, that if anything this effect generally works the other way, with children choosing more education when the labour market is weak. Goldin (1999) shows that the biggest increase in high-school enrolment and graduation rates in the US took place during the Great Depression; Betts and McFarland (1995) show that a 1 per cent increase in the unemployment rate is associated with a 4 per cent increase in full-time attendance at community colleges; and Kane (1994) shows that the enrolment of students in college is negatively associated with average weekly earnings in manufacturing and positively associated with the state unemployment rate. More recently, McVicar and Rice (2001) find that the substantial rise in youth unemployment of the early 1990s in the UK contributed to the growth in participation in further education. Similarly, Clark (2011) finds that the state of the youth labour market has large impacts on enrolment in post-compulsory education in the UK.

III. Methodology

To estimate the impact of father's job loss on the educational attainment of the child, we follow much of the previous literature by estimating a reduced-form regression of the educational attainment of the child at age 16, $Educ_{i,t}$, on a dichotomous variable indicating whether the father has been displaced, $Disp_{i,t-1}$, plus a range of baseline background controls from period $t-1$:

$$(1) \qquad Educ_{i,t} = \alpha + \beta Disp_{i,t-1} + \delta \ln Y_{i,t-1} + \theta Educ_{i,t-1} + \mathbf{Z}_{i,t-1}\tau + \varepsilon_{i1t}.$$

$Educ_{i,t-1}$ is the prior attainment of the child in period $t-1$ and hence we are modelling the impact of the shock of job loss on a child's educational development trajectory rather than the level; $\ln Y_{i,t-1}$ is the log of the prior family income in period $t-1$; $\mathbf{Z}_{i,t-1}$ is a range of background characteristics of the child including non-cognitive skills, ethnicity, the number of siblings and gender controls; and ε_{i1t} is the error term. The coefficient on $Disp_{i,t-1}$ is our

coefficient of interest. We begin with this simple baseline model to show the raw coefficient of the impact of job loss on GCSE attainment, conditional on observable differences between children prior to the recession to control for any sample selection. We will return to this point shortly.

To control for any observable differences across the families that might be driving this raw correlation between job loss and child's educational attainment, additional controls for the socio-economic status of the father, $\mathbf{X}_{i,t-1}$, are added in equation (2). The controls include social class, education, age, housing tenure and region of residence of the father prior to displacement. The inclusion of these controls should minimise observable differences between those fathers who experienced job loss during the recession of the 1980s and those who did not, hence reducing any observable selection effect. The recession, although unanticipated, hit manual industries much harder than non-manual industries. We may therefore be concerned that any effect that we are estimating is working through differences in the education level or class of the father rather than the impact of job loss. The addition of these controls goes some way to mitigating these concerns about potential selection bias into the displaced group. All controls until this point are exogenous and predetermined to ensure that they are not affected by the displacement.

$$(2) \qquad Educ_{i,t} = \alpha + \beta Disp_{i,t-1} + \delta \ln Y_{i,t-1} + \theta Educ_{i,t-1} + \mathbf{Z}_{i,t-1}\tau + \mathbf{X}_{i,t-1}\vartheta + \varepsilon_{i2t}.$$

Finally, a control for income at age 16, $Y_{i,t}$, is included in equation (3) to assess whether this is the main driver of any impact of job loss on the child's educational attainment. If income growth, or a lack of it due to job loss, is the main driver, we would expect the inclusion of income in period t to push any estimated impact, $\hat{\beta}$, toward zero.

$$(3) \qquad Educ_{i,t}$$
$$= \alpha + \beta Disp_{i,t-1} + \gamma \ln Y_{i,t} + \delta \ln Y_{i,t-1} + \theta Educ_{i,t-1} + \mathbf{Z}_{i,t-1}\tau + \mathbf{X}_{i,t-1}\vartheta + \varepsilon_{i3t}.$$

To be confident that we are indeed capturing the impact of job loss with economic consequences for those families affected, we consider the impact of job displacement in period $t-1$ on family income in period t (at age 16). As in Oreopoulos, Page and Stevens (2008), our motivation for this stage is to illustrate that the families we identify as experiencing an employment shock during the recession can be seen to have slower income growth over the period than families that are not exposed to an employment shock. This acts as a validation that our measure is capturing involuntary job loss as it places it alongside the range of studies discussed above that have highlighted the impact of job loss on earnings and family income. Note that the post-

displacement income is measured at age 16 in 1986 and it is likely that the fathers will have moved back into work by then. Therefore we are estimating a long-term income shock rather than the immediate effect of displacement. The following equation illustrates this:

$$(4) \qquad \ln Y_{i,t} = \alpha + \beta Disp_{i,t-1} + \delta \ln Y_{i,t-1} + \mathbf{X}_{i,t-1} \vartheta + u_{it}.$$

We estimate equation (4) in two forms: first, by regressing income in period t (age 16) on displacement in period $t–1$ and income in period $t–1$ (age 10) plus a range of background characteristics of the father, $\mathbf{X}_{i,t-1}$, including the class, education, age, housing tenure and region of residence of the father prior to displacement. If there is a direct impact of displacement on later family income when controlling for prior income, there is a correlation between job displacement and income growth across the period. We also estimate the impact of job displacement on income as a first difference across the period (i.e. with $\delta = 1$ in equation (4)), directly estimating the association between displacement and income growth over the period. If our measurement of displacement is predicting income losses, this provides reassurance that we are indeed measuring an employment shock that has real economic consequences for the families affected.

The estimation structure in equations (1)–(3) controls for prior child attainment so that we are estimating child development across the period rather than level effects. However, there could still be a selection bias in our estimates if displaced fathers' children were falling behind non-displaced fathers' children prior to the period of displacement – a pre-existing downward trend. In an attempt to assess the impact of selection, we estimate a placebo test that considers the difference in child development trends measured before the father was displaced:

$$(5) \qquad Educ_{i,t-1} = \alpha + \beta Disp_{i,t-1} + \gamma \ln Y_{i,t} + \theta Educ_{i,t-2} + \mathbf{Z}_{i,t-2} \tau + \mathbf{X}_{i,t-2} \vartheta + v_{it}.$$

If those children with displaced fathers differ in terms of underlying characteristics – through the transmission of genetic endowments, for example – from the children with non-displaced fathers, we would expect to see a significant relationship between the displacement dummy and prior educational development measured *before* the fathers were displaced. Equation (1) already includes prior attainment, but we can go further to explore prior trends in development between the ages of 5 and 10 and so explore a difference-in-difference type of structure looking at child development trajectories before and after the displacement shock. As will be seen from the results in Section V.2, we do not observe any statistical differences in attainment between the displaced children and the non-

displaced children prior to the fathers being displaced. This suggests that selection is not playing a large role in this story.

Having assessed the validity of the measure of job displacement and shown the causal impact on educational attainment, we turn to consider whether there are any longer-term impacts of fathers' job loss on the next generation by repeating the analysis from equation (3) but replacing educational attainment with two later labour market outcomes. We consider the impact of job loss on the child's early labour market experience to assess whether there is an intergenerational transmission of unemployment. In addition, to look more directly at the impact of displacement on social mobility, we consider whether there are long-term effects on the child's labour market earnings at age 30/34.

IV. Data

In this paper, we combine information from the British Cohort Study (BCS) of those born in 1970 with industry-based labour market information obtained from the *Employment Gazette* in 1980 and 1983. The main issue in our analysis is that, unlike Oreopoulos, Page and Stevens (2008) or Bratberg, Nilsen and Vaage (2007), we cannot observe fathers' displacement directly and instead seek to use the recession as an exogenous source of job loss. We define displacement as a result of the recession as the combination of two pieces of information. First, we identify the father as a job leaver if he was working in 1980 but was either not working or working in a different broad industry group in 1986.[9] Second, we combine this information with the extent of the industry employment shrinkage during the recession to describe a set of hard-hit industries. Here we describe the data and define the key variables of interest.

The BCS includes all those born in Great Britain between 5 and 11 April 1970 inclusive. Information was obtained about the sample members and their families at birth and at ages 5, 10, 16, 26, 30, 34 and 38. The BCS contains the employment status of the father of the cohort member in 1980 and 1986 and the disaggregated three-digit industry code of the father for the same dates (Standard Industrial Classification, SIC). There are 10 one-digit industry groups and 906 three-digit industry groups.

Employment data at the three-digit industry level are taken from the *Employment Gazette* in 1980 and 1983. These provide us with the numbers of employees in each industry group in each year, allowing us to create an employment change variable for each three-digit industry code.[10] We use

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[9]We can only observe the employment status and industry that the father works in at two points in time, six years apart, which straddle the recession's impact on employment.

[10]We create the industry-level employment change variables between 1980 and 1983, rather than between 1980 and 1986, as the industry classification was modified in 1983, leaving the 1980 (SIC68)

this information to identify a 'hit' group, referring to a subgroup of our sample who were in the industries most affected (or hardest hit) by the recession. This group is composed of fathers in industries in 1980 that experienced at least a 20 per cent loss in employment from 1980 to 1983. Table 1 shows that these industries shrank by an average of 27 per cent in just three years, compared with a decrease of just 4 per cent in the remaining industries. This hit group covers around a quarter of children in our final sample. We explore the robustness of the 20 per cent cut-off to alternative specifications in Section V.2.

To define our group of 'displaced' fathers, we combine this 'hit' indicator with information on job leavers. To define job leavers, we create a dummy variable equal to 1 if the father is employed in 1980 and either out of work or employed in a different industry at the one-digit level in 1986, and 0 otherwise. Fathers are defined as 'displaced' if they worked in a 'hit' industry in 1980 and became unemployed or changed industries between 1980 and 1986.

We make the case that fathers in the hit group who became unemployed or changed industries were forced to do so, and for reasons unrelated to their personal characteristics, due to the exogenous shock of the recession. We choose not to restrict our displaced group to only those fathers who were observed to be unemployed in 1986, as we would like to include those fathers who were made temporarily unemployed by the recession before finding new employment, to avoid the associated selection problem. As we cannot observe the exact point at which the father was made unemployed between 1980 and 1986, we hope to include some of these fathers in our analysis by including those fathers observed in a different industry in 1986. We will still not capture fathers who were displaced and then returned to the same one-digit industry. In addition to our displaced group, we separate out a group of fathers who are in the hit group but for whom information on their employment status in 1986 is missing. We create a distinct indicator for this group ('Unknown Displaced') with the assumption that these fathers will in fact be a composite of displaced and non-displaced fathers.

Both our 'Displaced' and 'Unknown Displaced' groups may be defined with error as it is likely that some of those classified as displaced may have changed industries voluntarily. Likewise, in our comparison group 'Not Displaced', some fathers who are observed in the same industry in 1986 may have been made redundant and returned to work in the same industry for a different firm. The second row of Table 2 shows that families where the father was displaced experienced substantial reductions in their income growth between 1980 and 1986 relative to the non-displaced, with a 9

and 1986 (SIC80) classifications incompatible with respect to the number of employees. Given that the recession largely impacted between 1980 and 1983, we find this not to be of concern. For our placebo test, we match in a similar change in three-digit industry-level employment from 1975 to 1980.

percentage point difference in mean income growth. This suggests that the employment shock is capturing an identifiable economic impact on these families during the recession, regardless of the error.

Our primary dependent variable is GCSE attainment at age 16 (in 1986), which is available as the number of GCSEs at various grades and as a total point score.[11] Standardised versions of these variables, with mean 0 and standard deviation 1, are created for comparability across measures in the placebo analysis in Section V.2. When later outcomes are considered, information from the monthly work history of the cohort member from ages 16 to 23 is used to create a proportion of time spent not in employment, education or training (NEET) over the period. Earnings measures are averaged from observations at ages 30 and 34 to create an average adult earnings measure for the cohort member. The prior ability of the child is included in the form of age 10 cognitive and non-cognitive scores.[12] Controls are also included for the gender and ethnicity of the child, to remove observable differences over these domains.

Information on the family income in 1980 and 1986 is available in banded form, where parents are asked to place their usual total income into the appropriate band (there were seven options at age 10 and eleven at age 16). We generate continuous income variables at each age by fitting a Singh–Maddala (1976) distribution to the data using maximum likelihood estimation.[13] Changes in the log of parental income between 1980 and 1986 are also derived. We utilise the detailed information available on the socio-economic status of parents to control for heterogeneity across individuals. Indicators of the social class and education of the father, alongside the housing tenure, parental age and the region of residence of the family, are all included in the analysis to account for any variation in outcomes across these groups. To help ensure that these controls are exogenous, they are all measured in 1980, before the recession.

Although the BCS was nationally representative for the original sample of 17,000, this analysis requires a number of sample restrictions that limit our final sample to 3,051. Our four main restrictions are that the cohort member must report a GCSE outcome at 16, 26 or 30, that we must be able

[11]The actual exams taken were O levels and CSEs, the equivalent of GCSEs. See footnote 15 for more detail.

[12]Early childhood cognitive ability is measured using scores from reading, maths and British Ability Scale (IQ) tests sat at age 10. For our placebo test, cognitive test results from age 5 are used. Non-cognitive traits, including application, extroversion, clumsiness, hyperactivity and anxiety, are provided by teacher reports at age 10, while anti-social and neurotic scales are provided by mother reports at age 5. Direct questions addressed to the children provide locus-of-control information and self-esteem measures at age 10.

[13]We also adjust the variables to net measures, using the Family Expenditure Survey from 1980 and 1986, and impute Child Benefit for all families based on the number of children in the household and lone-parent status. Child Benefit rates were obtained from http://www.ifs.org.uk/fiscalFacts/benefitTables.

to observe their family income at age 10 and at age 16, and that their father must be employed in 1980 and provide a three-digit industry code. This means that children without a father figure present in the household are dropped and hence we are focused on children in families with two parents or a father figure present.[14] Comparing the father's social class at the child's

TABLE 1

Employment changes in the industry in which the father was working in 1980, for recession and pre-recession periods

A. Full population with SIC68 information

	Proportion change in employment		*Sample size*
	Recession period (1980–83)	Pre-recession period (1975–80)	
Total	−0.108	−0.021	10,028
Hit[a]	−0.271	−0.062	2,660
Not hit	−0.049	−0.006	7,368
Displaced[b]	−0.281	−0.066	505
Unknown displaced[c]	−0.269	−0.061	1,688
Not displaced[d]	−0.061	−0.009	7,835

B. Working sample

	Proportion change in employment		*Sample size*
	Recession period (1980–83)	Pre-recession period (1975–80)	
Total	−0.095	−0.019	3,051
Hit[a]	−0.269	−0.063	710
Not hit	−0.042	−0.006	2,341
Displaced[b]	−0.278	−0.067	240
Unknown displaced[c]	−0.266	−0.057	238
Not displaced[d]	−0.062	−0.011	2,573

[a]Refers to those industries experiencing at least a 20 per cent decrease in employment from 1980 to 1983 based on the three-digit Standard Industrial Classification (SIC68) of the father in 1980.
[b]Defined as those hit hardest by the recession (in a 'hit' industry in 1980 and changed industry between 1980 and 1986 including those who dropped out of work altogether).
[c]Defined as those in the 'hit' industries in 1980 with information not available as to whether they moved or stayed in the same industry in 1986.
[d]Defined as those in the 'not hit' industries and those in the 'hit' industries who were not 'Displaced' or 'Unknown Displaced'.

[14]There were also a few industries where we were unable to obtain national data on employment levels for 1980 and 1983 and so the sample was restricted to those cohort members who had non-missing information for their father's industry-level employment change between 1980 and 1983. Note that in each case we restrict our sample on the basis of information on the cohort member's father rather than mother. During the 1980s, fathers tended to be the dominant earners within families, while women were experiencing broad changes in their labour market participation.

birth in the full sample and in our restricted final sample suggests that our sample restrictions and any attrition in the longitudinal survey are not causing major differences in the socio-economic background of those who are finally selected compared with the full nationally representative sample. Of course, we are unable to say anything about any potential differences in the unobservable characteristics of our sample compared with the nationally representative sample.

Table 1 presents summary employment statistics at industry level for each group of fathers in the recession and pre-recession periods, for the population in panel A and for our working sample in panel B. The figures in each panel are very similar, further suggesting that sampling bias is not a concern. Focusing on panel B and our working sample: for fathers defined as displaced – that is, job leavers from hit industries – their industries experienced an average 28 per cent decrease in employment, compared with 6 per cent for those who were not displaced. Those in the 'Unknown Displaced' category, for whom no information on their employment status in 1986 was available, appear to come from very similar industries to those observed as displaced.

The child and parental characteristics of our final sample, split into three subgroups based on the displacement characterisation, are described in Table 2. The displaced group differs significantly from the comparison group with respect to the characteristics of both the children and the fathers. The characteristics of the 'Unknown Displaced' fathers group look more similar to those of the displaced fathers than to those of the comparison group. Children from households where the fathers were displaced had poorer educational outcomes at both 10 and 16, and displaced fathers tend to have worse educational qualifications themselves. This is not surprising given the types of industries that were hit during the recession.

The extent to which the industry is hit (and hence the likelihood that the father is displaced) is deemed exogenous to the father's unobserved characteristics and to the child's educational development and later labour market outcomes. To confirm that the employment trends between 1980 and 1983, from which our hit (and subsequently displaced) group is derived, are not simply an extension of existing employment trends that began prior to 1980, we compare them with the percentage change in industry-level employment between 1975 and 1980 (shown in the second column of Table 1). This indicates that, overall, there was very little change in the period prior to the recession, with an average 2 per cent decrease in employment across industries. Comparing the 1975 to 1980 employment changes for our hit group with the changes for those who were not hit suggests that there was a small difference in employment trends prior to the recession across groups.

TABLE 2

Summary statistics by group

	Displaced[a]	*Unknown displaced[b]*	*Not displaced[c]*
Proportion change in industry employment (1980–83)[d]	–0.278	–0.266	–0.062
Log change in family income (1980–86)	–0.024	–0.018	0.072
Child's attainment			
Number of GCSEs, grades A*–C	3.046	3.303	4.253
Cognitive ability at age 10	0.121	0.110	0.299
Father's education (%)			
Obtained degree	2.74	4.09	12.83
Obtained A levels	6.85	9.55	13.17
Obtained GCSEs	14.16	10.00	15.27
Left at school-leaving age	75.34	75.91	58.43
Left before school-leaving age	0.91	0.45	0.30
Sample size	*240*	*238*	*2,573*

[a]Defined as those hit hardest by the recession (at least a 20 per cent decrease in employment at their origin industry level and changed industry between 1980 and 1986 including those who dropped out of work altogether).
[b]Defined as those in the 'hit' industries in 1980 with information not available as to whether they moved or stayed in the same industry in 1986.
[c]Defined as those in the 'not hit' industries and those in the 'hit' industries who were not 'Displaced' or 'Unknown Displaced'.
[d]Refers to the change in employment based on the three-digit Standard Industrial Classification 1968 (SIC68).

We check the (more important) assumption that there was no preceding difference in the child's educational development, conditional on observable characteristics, by running a placebo test on early educational attainment (as described in equation (5) above) using cognitive scores at age 5 and our pre-recession industry-level employment data. This placebo test is undertaken in Section V.2.

V. Results

1. Job displacement and educational attainment

To consider the impact of fathers' job loss on the next generation's educational attainment, Table 3 shows the impact of father's displacement on two separate measures of GCSE attainment. In panel A, we present the results for a continuous measure of attainment at 16, the total GCSE point score for a smaller sample where complete individual grades are observed (a grade A is awarded 55 points, a grade B 46, a grade C 40, a grade D 34 and a

grade E 28[15]). Panel B presents results using the outcome measure of the number of GCSEs obtained at grades A*–C.[16] We choose to present the continuous point score alongside the more conventional number of grades A*–C measure as we are particularly interested in any effects at the lower end of the educational distribution given that the shock was more prevalent in low-skilled industries. Column 1 conditions on only child characteristics, including cognitive and non-cognitive test score attainment at age 10, ethnicity and gender, and 1980 family income. We build the regression controls in stages to show the impact of parental socio-economic status and any associated lower income growth on the relationship between job loss and attainment.

In panel A, in the least restrictive specification, children with displaced fathers obtained 26 points less in their total point score, roughly equivalent to dropping from an A to an E in one exam or from an A to a C in two exams. For our number of GCSEs measure in panel B, father's displacement is associated with a reduction of roughly two-thirds of a GCSE grade A*–C given the child's attainment at age 10. The average attainment in the sample is four GCSEs, so this is a non-trivial change. As we add further background characteristics to the model, this effect reduces in magnitude and significance. Column 2 introduces the parental background characteristics including housing tenure, father's social class, father's education, father's age and the region of residence. These additional background controls reduce the impact of father's displacement in panel A to 20 points less for the child's total point score, dropping from an A to a D in one exam. The impact on the number of GCSEs at grades A*–C also falls, with children with displaced fathers experiencing on average half a grade lower GCSE results than children with non-displaced fathers. This indicates that only a small proportion of the initial correlation was working through differences in the observed socio-economic status of those in the displaced group compared with the not displaced group.

When we include family income in 1986 in the specification in column 3, to assess whether income is the main driver of this effect of job loss on child attainment, it can be seen that the coefficient on our displaced measure falls again for both outcomes, to 18 points in panel A and just under half of a GCSE at grades A*–C in panel B. A priori, one might have expected the negative association found between father's job displacement and family income to be important in explaining any significant association observed

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[15]Based on the new GCSE point scoring system from the Department for Education from 2004. As A* did not exist, an average of the A* and A point scores is assigned to an A grade at O level. Point scores are available for grade F and G whereas information is only available on grades A to E in the BCS. CSEs are assigned lower points (grade 1 = 40, grade 2 = 34, grade 3 = 28, grade 4 = 22 and grade 5 = 16).

[16]The sample here is larger as information on the number of GCSEs obtained was asked for again at ages 26 and 30. Individual grade breakdowns were only given at age 16.

TABLE 3

Relationship between displacement and child attainment at 16

A. GCSE point score

	(1)	*(2)*	*(3)*
Displaced[a]	−25.92	−20.18	−17.67
	[7.526]***	[7.287]***	[7.400]**
Unknown displaced[b]	2.622	7.850	8.370
	[14.63]	[14.38]	[14.34]
Income at 10	32.67	0.832	−12.64
	[6.554]***	[7.282]	[8.183]
Income at 16			23.81
			[6.668]***
N	2,188	2,188	2,188
Adjusted R[2]	0.331	0.366	0.370
Controls			
Child and prior attainment[c]	Yes	Yes	Yes
Parents[d]	No	Yes	Yes
Income at 16	No	No	Yes

B. Number of GCSEs at grades A*–C

	(1)	*(2)*	*(3)*
Displaced[a]	−0.674	−0.529	−0.467
	[0.191]***	[0.187]***	[0.187]**
Unknown displaced[b]	−0.439	−0.231	−0.192
	[0.192]**	[0.189]	[0.188]
Income at 10	1.422	0.544	0.201
	[0.155]***	[0.170]***	[0.189]
Income at 16			0.629
			[0.149]***
N	3,051	3,051	3,051
Adjusted R[2]	0.354	0.391	0.395
Controls			
Child and prior attainment[c]	Yes	Yes	Yes
Parents[d]	No	Yes	Yes
Income at 16	No	No	Yes

[a]Defined as those hit hardest by the recession (at least a 20 per cent decrease in employment at their origin industry level and changed industry between 1980 and 1986 including those who dropped out of work altogether).

[b]Defined as those in the 'hit' industries in 1980 with information not available as to whether they moved or stayed in the same industry in 1986.

[c]Standardised attainment at age 10 in maths, reading and IQ tests, standardised non-cognitive scores at age 10, ethnicity and gender.

[d]Housing tenure, region, father's social class, father's education and father's age in 1980.

Notes: Standard errors are given in brackets. * indicates significance at the 10 per cent level, ** at the 5 per cent level and *** at the 1 per cent level.

between father's job displacement and the child's GCSE outcomes. However, the evidence from columns 2 and 3 in both panels of Table 3 suggests that this is not the case, with the inclusion of income only accounting for about 12 per cent of the overall observed GCSE penalty in each measure of attainment. For both outcomes, there remains a significant negative effect from father's job loss. Although changes in family income are not irrelevant in mediating the relationship between job displacement and the child's GCSE attainment, the proportion of the observed association between father's displacement and GCSE attainment accounted for by the change in income between 1980 and 1986 is small, suggesting that other factors associated with father's displacement hold the explanatory power determining this relationship.[17] Rege, Telle and Votruba (2007) find similar results that income is not the main driver of this relationship in their analysis of Norwegian data. In summary, these results suggest that father's displacement is associated with a child achieving just under half of one GCSE less than their non-displaced counterparts. This is modest but not trivial in terms of its likely future economic impact, given that an extra GCSE leads to a 4 per cent higher return in the labour market on average at age 30/34 for this cohort (see Table A1 in the online appendix[18]).

Moving on to consider the impact on children's educational attainment of fathers who were working in a hit industry with their situation in 1986 unclear ('Unknown Displaced'), Table 2 suggested that the unconditional characteristics of this group resembled those of the children in the displaced group to a greater degree than the non-displaced comparison group. This is not supported by the second row in both panels of Table 3. In these specifications, the children with fathers in this group obtain no fewer points and a slightly lower total number of grades A*–C in their GCSEs than their non-displaced counterparts. Our interpretation of this result is that this group is likely to be a composite of fathers who were displaced from hit industries and those who were not; thus there is likely to be greater attenuation bias in the estimated impact on child outcomes.

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[17]We investigated this further by including a broad set of 'stress indicators' in additional (non-reported) specifications. We included alcohol and smoking indicators for the child and the parents, parental relationship status (including any changes between 1980 and 1986), parent–child conflict indicators, child mental health indicators and whether the child has been in trouble with the police. The results suggest that although all of these stress indicators were, to one degree or another, significant in equation (3), they were, perhaps surprisingly, all virtually uncorrelated with our displaced variable, such that their inclusion in equation (3) left the coefficient on father's displacement effectively unchanged. This implies that the relationship between father's displacement and child's GCSE outcomes is not being mediated by these stress indicators.

[18]Available at http://www.ifs.org.uk/docs/fsjun12_greggetal_appendix.pdf.

2. Validation and robustness

The imperfect nature of the displacement measure means that validation is needed in terms of the economic impact of displacement and to address possible selection concerns about whether being displaced is related to prior child development. In addition, we check the robustness of the cut-off in terms of industry employment loss, which is used to identify the hard-hit industries.

The impact of job displacement on family income
Table 4 seeks to ensure that our displacement measure is capturing a real shock to the families who were impacted by displacement during the recession of the 1980s. Table 2 showed that families where the father was displaced between 1980 and 1986 experienced 9 per cent lower income growth over that period than families in the comparison group. Families with fathers in our 'Unknown Displaced' group also experienced similarly lower family income growth on average than the comparison group. Table 4 therefore seeks to assess whether these observed differences from Table 2 are due to selection on the background characteristics of the families experiencing displacement. It is important to remember that the displaced category combines both those who have not returned to employment by 1986 and those who have moved to a different industry by 1986.

TABLE 4

Relationship between displacement and family income

	Family income at 16	*Change in family income*
Displaced[a]	−0.101	−0.064
	[0.023]***	[0.025]***
Unknown displaced[b]	−0.066	−0.068
	[0.023]***	[0.025]***
Income at 10	0.558	
	[0.021]***	
N	3,051	3,051
Adjusted R^2	0.419	0.054
Controls[c]	Yes	Yes

[a]Defined as those hit hardest by the recession (at least a 20 per cent decrease in employment at their origin industry level and changed industry between 1980 and 1986 including those who dropped out of work altogether).
[b]Defined as those in the 'hit' industries in 1980 with information not available as to whether they moved or stayed in the same industry in 1986.
[c]Housing tenure, region, father's social class, father's education and father's age in 1980.
Notes: Standard errors are given in brackets. * indicates significance at the 10 per cent level, ** at the 5 per cent level and *** at the 1 per cent level.

The first column predicts income at age 16 for the displaced groups conditional on income, father's age, father's social class, father's education level, housing tenure and the region of residence in 1980. The second column repeats this analysis using a straight first difference, representing the income growth directly. For both measures, estimates of income growth are 6–10 per cent lower for the two groups than for the non-displaced comparison group. This suggests that father's displacement between 1980 and 1986 was not simply a proxy for other socio-economic characteristics determining family income. It is also worth noting that these effects are of a similar order of magnitude to those found in the existing job loss literature for the effects of job loss on permanent earnings.[19] As the gaps are very similar to the ones for the unconditional data presented in Table 2, there do not appear to be major selection biases here on observable characteristics of the father. We can thus be confident that our measure of job displacement is capturing a shock to the family circumstances from the recession of the 1980s that is borne out in lower income growth.

Placebo test
As outlined in Section III, regardless of the extent to which we can condition on observable characteristics of both the parents and the children, the results observed in Table 3 may still be driven by a selection effect or unobserved differences in characteristics between children whose fathers are in our displaced group and children whose fathers are not. Table 3 conditioned on prior attainment at age 10 but it is possible that those children with displaced fathers were already on a pre-existing downward trend and that this, rather than the displacement, is driving the results. If so, the observed significant association between the job loss of our displaced group and the child's GCSE attainment in Table 3 would be driven by differences in the initial unobserved heterogeneity creating a pre-existing trend in child development. To establish whether this is plausible, we investigate whether belonging to our displaced group is significant in explaining any of the variation in childhood development for cognitive outcomes between 1975 and 1980 (i.e. between cohort members at ages 5 and 10). If we find a significant association between displacement and cognitive outcomes in 1980, prior to the recession period, it would suggest that the children in our displaced group were performing relatively poorly compared with children in the non-displaced comparison group prior to the recession. This would raise questions as to our claim that we are measuring the impact of father's job loss in the recession.

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[19]Gregory and Jukes, 1997; Nickell, Jones and Quintini, 2002.

TABLE 5

Placebo test[a]

A. Age 10–16

	No. of GCSEs at A*–C (standardised)	GCSE point score (standardised)
Displaced[b]	–0.141	–17.959
	[0.055]**	[7.412]**
Unknown displaced[c]	–0.062	6.839
	[0.055]	[14.378]
Income at 16	0.206	19.151
	[0.039]***	[5.952]***
N	3,051	2,188
Adjusted R^2	0.391	0.382

B. Age 5–10

	Cognitive attainment (standardised)
Displaced[b]	–0.029
	[0.055]
Unknown displaced[c]	–0.055
	[0.055]
Income at 10	0.127
	[0.051]**
N	2,502
Adjusted R^2	0.394

C. Age 5–16

	No. of GCSEs at A*–C (standardised)	GCSE point score (standardised)
Displaced[b]	–0.138	–19.525
	[0.057]**	[7.757]**
Unknown displaced[c]	–0.072	5.789
	[0.057]	[15.023]
Income at 16	0.270	26.936
	[0.040]***	[6.163]***
N	3,051	2,188
Adjusted R^2	0.342	0.324

D. Age 5–16 (age 10 sample)

	No. of GCSEs at A*–C (standardised)	GCSE point score (standardised)
Displaced[b]	–0.127	–18.165
	[0.063]**	[8.486]**
Unknown displaced[c]	–0.018	17.537
	[0.062]	[16.923]
Income at 16	0.244	21.446
	[0.045]***	[9.799]***
N	2,502	1,799
Adjusted R^2	0.360	0.342

Notes: See opposite.

Due to data limitations, it is not possible to make the control set for this selection regression exactly equivalent to that used for the final specification of Table 3, as initial income and social class at age 5 are not observed in the data. Panel A of Table 5 shows a revised version of column 2 in Table 3, conditioning on later income (at age 16) and social class (at age 10) throughout. Note that the outcome of interest is now standardised attainment, for comparability across attainment measures at different ages, and hence these coefficients are not directly comparable to either measure used in Table 3. Table 5 indicates, as we saw in Table 3, that there is a significant impact of father's job loss on the child's (standardised) GCSE achievement. Again, the estimated impact for the 'Unknown Displaced' group is insignificantly different from zero when controlling for observable differences in family characteristics. These are our baseline results for comparison for the rest of the placebo tests.

Panel B of Table 5 represents our selection specification, to test whether the results of panel A are being driven by differences in unobserved characteristics between our displaced group and our non-displaced comparison group affecting educational attainment. The outcome measure is standardised age 10 (1980) cognitive attainment and the controls, where possible, are from 1975. Standardised attainment measures at age 5 are included here to assess whether there are similar attainment trajectories prior to the recession. The results show that the children with fathers belonging to our displaced group were not performing significantly worse in cognitive tests in 1980 than children with fathers in our non-displaced comparison group, given prior attainment. The coefficient is virtually zero and insignificant, suggesting that the children of displaced fathers were, conditional on other characteristics, of a comparable cognitive standard at age 10 to children in the comparison group. This strongly suggests that the observed differences in GCSE attainment between the children with displaced fathers and the comparison group are not driven by selection into our displaced group on unobserved characteristics affecting educational

attainment. This provides further supportive evidence to the claim that father's job loss during the recession of the 1980s significantly reduced educational development as no such gaps were emerging prior to the recession.
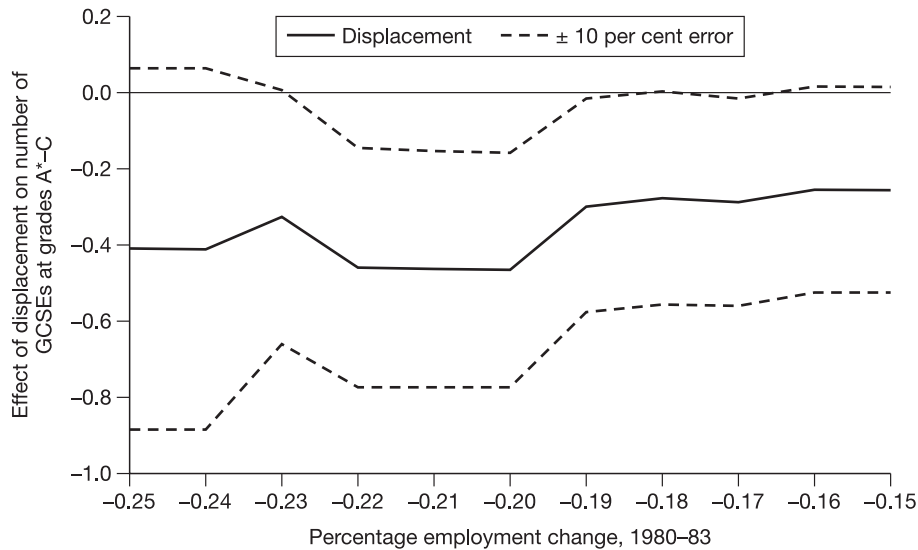
Although equivalent controls are used in panels A and B of Table 5, panel A uses measures (where possible) from 1980 (and family income from 1986) while panel B uses equivalent measures from 1975 (and family income from 1980). To test that our placebo results are not being driven by differential changes (for our displaced and comparison groups) in the values of the control variables between 1975 and 1980, in panel C we rerun panel A using the same control set as panel B, i.e. using the control set taken from 1975 (at age 5). If the 1975 control set is driving the insignificant results observed in panel B, we would expect the results of panel C to be insignificant as well. It can be seen, however, that the results in panel C are very similar to those in panel A, suggesting that the 1975 control set is not driving the main result of Table 5. In addition, it may be the case that the more restrictive sample used in panel B (selecting further on observing all prior attainment measures) could be driving the lack of significance in the results. We therefore rerun panel C on this more restrictive sample in panel D to check that the results are not driven by this further sample restriction. The results are once again remarkably similar to those found in panel A, suggesting that the differences between panels A and B are real and not driven by either the control set or restricted sample used in panel B. We conclude that there were no significant differences in attainment between children with displaced fathers and children with non-displaced fathers prior to the recession period.

Robustness to cut-offs

It is important to gauge how much of an impact our chosen definition of displacement has on the results that we find. Although our displaced and non-displaced categories are not chosen arbitrarily (they are defined by observed outcomes in 1986), the definition of being in a 'hit' and a 'not hit' industry, set at a 20 per cent employment shock, is an arbitrary choice. Figure 1 illustrates the displacement effect from the final column of panel B in Table 3 across a range of industry-level percentage employment changes. It can be seen that the magnitude of the displacement effect is of a similar level for industries with employment losses of 20–25 per cent. However, for those fathers who were displaced from industries experiencing employment loss above 23 per cent, the displacement effect becomes insignificant as the confidence intervals are large, given how few displaced we can observe in this category. Below the 20 per cent employment loss point, those displaced from industries experiencing a 17–19 per cent employment loss still had a

FIGURE 1

Robustness tests on the change in industry-level employment from 1980 to 1983

Notes: Displaced is defined as those hit hardest by the recession (varying percentage change in employment at their origin industry level and changed industry between 1980 and 1986 including those who dropped out of work altogether). A full set of controls is included for each regression, including income at ages 10 and 16. Controls: *child* – standardised attainment at age 10 in maths, reading and IQ tests, standardised non-cognitive scores at age 10, ethnicity and gender; *parents* – housing tenure, region, father's social class, father's education and father's age in1980.

significant negative impact on their child's attainment of around a third of a GCSE grade. At 15–16 per cent employment loss, the effect is similar in magnitude but the estimates become too imprecise for there to be any discernible difference between the displaced and not displaced groups. The substantive findings of the impact of job loss on educational attainment in our analysis are therefore not restricted to our specific choice of employment change. An effect appears to exist across a wide range of employment change values.[20]

Summary

These results strongly indicate that the children of displaced fathers were not facing a pre-existing adverse deterioration in educational attainment that may have continued into the recession period. Despite lower-than-average attainment at age 10, they were doing no worse than children with non-displaced fathers with similar background and attainment levels prior to the recession. The fact that we also observe significant associated economic

[20]This result is replicated when the alternative educational attainment measure of GCSE point score is used instead.

effects on family income provides clear validation that we are observing the effects of an economic shock to the family that produces a modest but significant fall in educational performance in adolescent children. Finally, the results are not sensitive to the cut-off used to identify hard-hit industries during the recession.

3. Job displacement and later labour market outcomes

Oreopoulos, Page and Stevens (2008) have found significant impacts of father's job loss on the child's later life outcomes, including employment experiences and earnings. This paper has found a significant negative impact of fathers' job loss on their children's educational attainment and we know that educational attainment is an important driver of adult economic outcomes and hence intergenerational economic mobility.[21] We therefore move on to consider whether job loss has any longer-term direct impacts on the child's early labour market experience and later earnings.

Table 6 presents results from our cohort focusing on these later labour market outcomes. The upper panel presents the impact of displacement on the proportion of time the child spends not in employment, education or training (NEET) from age 16 to 23, whilst the lower panel presents the impact on the adult earnings of the child, averaged at ages 30 and 34. Column 1 is the conditional model including child and family background characteristics and column 2 conditions also on prior educational attainment by adding GCSEs. There is suggestive evidence that father's job loss has a significant effect on the child's later workless experiences and that this effect is not working through the lower GCSE attainment seen in Table 3. This is consistent with work by Macmillan (2012), who finds that fathers' displacement causes their children to suffer more early worklessness and that this appears to be driven more by personality traits and behavioural outcomes than by education and cognition. Children with displaced fathers spend, on average, 1.6 per cent more time NEET than those with non-displaced fathers.

The impact of father's job loss on the average earnings of his child at age 30/34 is just under 6 per cent, although this effect is not statistically significant. Column 2 of Table 6 suggests that a third of this effect can be accounted for by the educational attainment of the child at age 16. Comparing this effect with the combined income effect of 10 per cent from Table 4 and the return to half a GCSE at grades A*–C of about 2 per cent,[22] this estimated wage effect is large but not implausible. It may therefore be a lack of precision in our estimates due to small sample sizes that is driving

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[21]Blanden, Gregg and Macmillan, 2007.

[22]Calculated from a wage regression; see Table A1 in the appendix.

TABLE 6

Relationship between displacement and later outcomes of the child

A. Proportion of time spent NEET, age 16–23

	(1)	(2)
Displaced[a]	0.013	0.016
	[0.008]*	[0.008]**
Unknown displaced[b]	−0.001	−0.001
	[0.008]	[0.008]
Income at 10	−0.012	−0.012
	[0.007]	[0.007]*
N	2,884	2,884
Adjusted R^2	0.035	0.036
Controls		
Child and prior attainment[c]	Yes	Yes
Parents[d]	Yes	Yes
GCSEs[e]	No	Yes

B. Average earnings at age 30/34

	(1)	(2)
Displaced[a]	−0.057	−0.037
	[0.047]	[0.046]
Unknown displaced[b]	−0.041	−0.021
	[0.047]	[0.045]
Income at 10	0.123	0.089
	[0.042]***	[0.041]**
N	2,252	2,252
Adjusted R^2	0.320	0.360
Controls		
Child and prior attainment[c]	Yes	Yes
Parents[d]	Yes	Yes
GCSEs[e]	No	Yes

[a]Defined as those hit hardest by the recession (at least a 20 per cent decrease in employment at their origin industry level and changed industry between 1980 and 1986 including those who dropped out of work altogether).

[b]Defined as those in the 'hit' industries in 1980 with information not available as to whether they moved or stayed in the same industry in 1986.

[c]Standardised attainment at age 10 in maths, reading and IQ tests, standardised non-cognitive scores at age 10, ethnicity and gender.

[d]Housing tenure, region, father's social class, father's education and father's age in 1980.

[e]This measure is the number of GCSEs. The point score gives very similar magnitudes.

Notes: Standard errors are given in brackets. * indicates significance at the 10 per cent level, ** at the 5 per cent level and *** at the 1 per cent level.

our insignificant finding rather than a null result. This does not necessarily mean that fathers' job loss does not affect intergenerational economic mobility as we have seen that this has a direct impact on educational attainment and youth unemployment which we know drive the relationship between incomes across generations.[23]

VI. Conclusions

There has been a large literature identifying that job loss has long-term damaging effects on a worker's employment and earnings. This research provides strong evidence that there is also an intergenerational effect whereby fathers' job loss has a negative impact on children's educational attainment and youth unemployment in the UK. By matching in employment changes by industry from the *Employment Gazette*, we are able to identify those fathers in the British Cohort Study who were working in industries hit hardest by the recession of the 1980s. We combine this information with the father's observed industry and employment status six years later to define a group of fathers who were likely displaced as an effect of the large industry employment shock of the early 1980s. The evidence presented here suggests that there was a significant impact of fathers being displaced from their jobs during the recession of the 1980s on both the economic resources of the family and the child's educational attainment. Although differences are observed between the characteristics of fathers who were displaced and those who were not, there appear to be no differences in the educational development trends between the children of the displaced fathers and the children of non-displaced fathers before the recession and displacement occurred. This strongly suggests that the impact is not a selection effect.

Children with displaced fathers obtained, on average, 18 grade points or half a GCSE at grades A*–C less than those with non-displaced fathers, equivalent to a 2 per cent wage penalty at age 30/34. Furthermore, the results suggest that the father's displacement raises the child's exposure to youth unemployment by about 1½ per cent compared with the children of non-displaced fathers. The impact of fathers' job loss on the average earnings of their children at age 30/34 is estimated at 6 per cent, although this result is not statistically significant. About a third of this, albeit insignificant, result is operating through the significant education effect observed earlier. Given that the size of the income shock is of the order of 10 per cent and the education effect is about half a grade A*–C GCSE, which would have a return of about 2 per cent, this estimated effect is large despite being insignificant. The insignificance may be due to poor precision in estimation, through the small sample sizes, rather than to the true coefficient being zero,

[23]Blanden, Gregg and Macmillan, 2007.

as we do observe significantly adverse effects on education and youth unemployment. Therefore, the insignificant effect on earnings does not mean that the impact of job loss will not affect social mobility. Those with lower income, education and social class were most affected by job loss and there is a direct effect on children's educational attainment and youth unemployment, which we know to be drivers of later earnings. This suggests that the recent recession in the UK may have significant long-term consequences for the children of those who lost their jobs.

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