

Entering the labour market in a weak economy: scarring and insurance

IFS Working Paper W17/27

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Abstract

This paper estimates the effects of entering the labour market when the economy is weak on subsequent living standards using consistent long-running household survey data from the UK. In line with previous research, we find persistent scarring effects on employment and earnings. However, we also provide the first estimates of impacts on net household incomes and household expenditures – standard proxies for material living standards – and we find little or no impacts. This is primarily due to two particular forms of insurance: the UK tax and transfer system and, even more importantly on average, the incomes of parents, with whom many young adults live in the years after leaving education. The interplay between heterogeneity in labour market scarring and insurance is key to understanding why parental incomes insure so much of the shock: lower-educated young adults experience the worst labour market scarring effects, but they are also highly likely to live with their parents in the years after labour market entry (irrespective of economic conditions), and the negative labour market effects are not so persistent as to outlast the typical period of co-residence. However, young adults not living with parents do see negative and persistent scarring effects feed through to their net incomes and expenditures. It may therefore be useful for future research on scarring to focus on this group, as well as the degree to which resources are shared within households between parents and their co-resident adult children.

JEL classification: D10, J23, J31, J64

Keywords: scarring, unemployment, household insurance

Acknowledgements: This project was funded by the Nuffield Foundation, but the views expressed are those of the authors and not necessarily those of the Foundation. Co-funding from the ESRC-funded Centre for the Microeconomic Analysis of Public Policy (CPP) at the Institute for Fiscal Studies (grant reference ES/M010147/1) is gratefully acknowledged. The authors would also like to thank Richard Blundell, Stephen Jenkins, members of the project advisory group, and seminar participants at the Institute for Fiscal Studies and at the Economic and Social Research Institute, Dublin, for useful comments. All errors are those of the authors.

Data from the Family Resources Survey were made available by the Department for Work and Pensions. Data from the Family Expenditure Survey, the Expenditure and Food Survey and the Living Costs and Food Survey are Crown Copyright, reproduced with the permission of the controller of HMSO and the Queen's Printer for Scotland, and accessed via the UK Data Archive.

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1. Introduction

How are individuals' living standards affected when they are unlucky enough to enter the labour market during a recession? In the aftermath of the Great Recession, there has been renewed interest in the extent to which young adults have been negatively affected by entering the labour market at a bad time. A body of previous research has found large and persistent negative impacts ('scarring') on the earnings and employment rates of people who leave education during a recession. However, when individuals face economic shocks, they may have access to forms of insurance (such as the tax and state transfer system) that mitigate the effects on their living standards. Given that individuals' living standards are of primary interest, it follows that the role of insurance is key to understanding the consequences of labour market scarring.

In this paper, we provide the first estimates of the impacts of entering the labour market when the economy is weak on the most commonly used proxies for households' material living standards – net (post-tax-and-transfer) household incomes, and household expenditures. By first looking at the impacts on the individual labour market outcomes studied in previous work, and then moving through a sequence of other outcomes, we identify which insurance mechanisms are important in insuring against the shock of entering the labour market at a bad time. We use repeated cross-sections of household survey data from the United Kingdom since the late 1970s, and exploit the fact that there have been three recessions (and recoveries from them) in that time, meaning individuals entering the labour market a few years apart faced very different initial economic conditions.

We find that there are substantial and persistent negative causal effects of entering the labour market when unemployment is high on the probability of being in work and on the pre-tax earnings of those in work. However, we find little or no impact on household net incomes or expenditures, even in the years immediately after leaving education when the labour market impacts are particularly large.

To explain this, we investigate a number of intermediate outcomes, which isolate the role of different insurance mechanisms. The key forms of insurance are the tax and transfer system and, most importantly on average, the incomes of parents, with whom many young people live in the years after they leave education. We show that the interplay between heterogeneity in labour market scarring and

in insurance is key to understanding why parental income insures so much of the shock for young adults. On average, it is lower-educated young adults who experience the worst scarring in the labour market; but this is also the group that is most likely to live with their parents in the years after leaving education. Moreover, because most of the labour market scarring fades away after around five years, it does not outlast the period in which a high proportion of young people live with their parents (especially for those most scarred).

However, we do uncover significant and persistent negative scarring impacts on the net incomes and expenditures of those people who do not live with their parents. We therefore suggest that fruitful further research on scarring would include a focus on this group, as well as the degree to which resources are shared within households between parents and their co-resident adult children.

This paper contributes to two literatures in economics that have to date remained distinct, and our main aim is to bring them together. The first is the ‘scarring’ literature on the persistent impacts of entering the labour market during a recession, or when unemployment is high, on labour market outcomes. Previous work on the impact of entering the labour market during a recession has shown that doing so can lead to significant and persistent negative impacts on individuals’ employment and earnings. Oreopoulos et al. (2012), using Canadian data, and Kahn (2010) and Altonji et al. (2016), using American data, all find persistent negative impacts on subsequent earnings of labour market conditions upon entry for college graduates, albeit with varying degrees of persistence.¹ Those papers find little or no impact on employment rates, but research on labour market scarring in European countries that looks not solely at university graduates, but also at those without tertiary education, has found significant and persistent negative impacts on employment probabilities (Burgess et al. (2003) in the UK, Raaum and Røed (2006) in Sweden, Schmillen and Umkehrer (2013) in Germany, Brunner and Kuhn (2014) in Austria and Haaland (2017) in Norway).

¹ Labour market institutions may be important determinants of scarring. Genda et al. (2010) find that scarring impacts of entering the labour market at a bad time are worse in the more rigid Japanese labour market than in the more flexible American system. Of all developed countries, however, the UK probably has the labour market institutions most similar to the US and Canada, making the effects potentially more comparable than if this study focused on a continental European country.

Of the many potential mechanisms behind these scarring effects, the literature has suggested that experiencing unemployment itself may worsen later life economic outcomes – for example, through the depreciation of human capital (Pissarides 1992) or becoming psychologically discouraged (Clark et al. 2001). In addition, there is evidence that leaving education in a recession leads to individuals taking lower-skilled work (Kahn 2010), in lower-quality or lower-paying firms (Brunner and Kuhn 2014; Oreopoulos et al. 2012), and to worse matches between workers and firms (Liu et al. 2016).

The second literature to which we contribute seeks to understand how individuals and households respond to economic shocks, and what insurance mechanisms allow their living standards to be insulated against these shocks. This literature has shown that key insurance mechanisms against shocks to wages or earnings include the tax and transfer system, though to a greater extent in Europe than in the US (Dolls et al. 2012), and family labour supply responses (Blundell, Pistaferri and Saporta-Eksten 2016). These can insure even persistent shocks (though, of course, taxes and transfers cannot insure *permanent* aggregate shocks, of which the Great Recession was one, without structurally weakening the public finances). Both mechanisms reduce the extent to which wage or earnings shocks actually result in falls in net household incomes. In addition, of course, households may be able to self-insure through the use of precautionary saving such that the impact of earnings shocks on their consumption, and hence living standards, is reduced or eliminated. This has also been found to be an important insurance mechanism, though to a lesser degree for persistent or permanent shocks, and to a lesser degree for low-educated households, who tend to have fewer assets (Blundell and Preston 2008).

Integrating these hitherto distinct literatures, on scarring and on insurance, is essential in order to understand properly the costs of scarring for young adults. Being unlucky enough to start one's career during a recession can be thought of as one type of shock that affects earnings. It is a shock with a particular degree of persistence (the main subject of the scarring literature to date), potentially varying by subgroup, and it is a shock that occurs at a very specific stage in the life cycle when the mix of insurance available is likely to be very different from that for the population as a whole (and hence from that studied by previous literature), though again it may well vary by subgroup. For example,

young adults at the start of their careers are much less likely to have partners or assets (two potential important forms of insurance), but much more likely to have co-residence with parents as a form of insurance. On the other hand, the prevalence of both of these forms of insurance changes quite quickly (in opposite directions) in the years after labour market entry, meaning that the relationship between the persistence of labour market scarring and the availability of insurance at different stages in young adulthood is a key determinant of the overall impacts of scarring on living standards. In addition, the way in which heterogeneity in labour market scarring relates to heterogeneity in the availability of insurance will be important: it matters whether the most scarred in the labour market are the least or most insured, for example.

For all these reasons, it is difficult to infer much from existing work about the consequences of entering the labour market at a bad time for young adults' living standards. To do that, one needs to study the role of insurance in this specific case. By tracing the impacts of entering the labour market in a weak economy from the traditional 'raw' individual labour market outcomes right through to household net income and household expenditure, we seek to better understand the true impacts on individuals' living standards and the insurance mechanisms that can mitigate these effects.

The rest of this paper proceeds as follows. Section 2 describes the data and Section 3 sets out the empirical methodology that we use to estimate the scarring impacts on measures of earnings, income and expenditure. Section 4 presents our results and Section 5 concludes.

2. Data

We pool data from two long-running repeated annual cross-section UK household surveys – the Family Expenditure Survey (FES) and its successors (the Expenditure and Food Survey and the Living Costs and Food Survey), and the Family Resources Survey (FRS). The FES surveys between around 5,000 and 6,500 households per year. We use FES data starting from 1978, when it began to record the age of leaving education. As well as detailed demographic information about each household, the survey asks about all sources of income for all members of the household, and it records household expenditures, asking what all members of the household buy over a two-week

period, plus regular payments such as household bills, rent and mortgage payments, and purchases of durable items that do not occur frequently.

The FRS is an annual cross-sectional data set that contains around 20,000 households per year. It is available from 1994–95 to 2015–16. Like the FES, it contains a battery of questions designed to measure individual and household incomes and sources of income, as well as the demographic characteristics of the household and the age at which adults left education. Unlike the FES, it does not measure household expenditures. For analysis of all other outcomes, we use the pooled FES and FRS data, since both data sets contain all other outcomes. The two data sets generally align very closely, but we control for any systematic differences between them (as explained in Section 3).

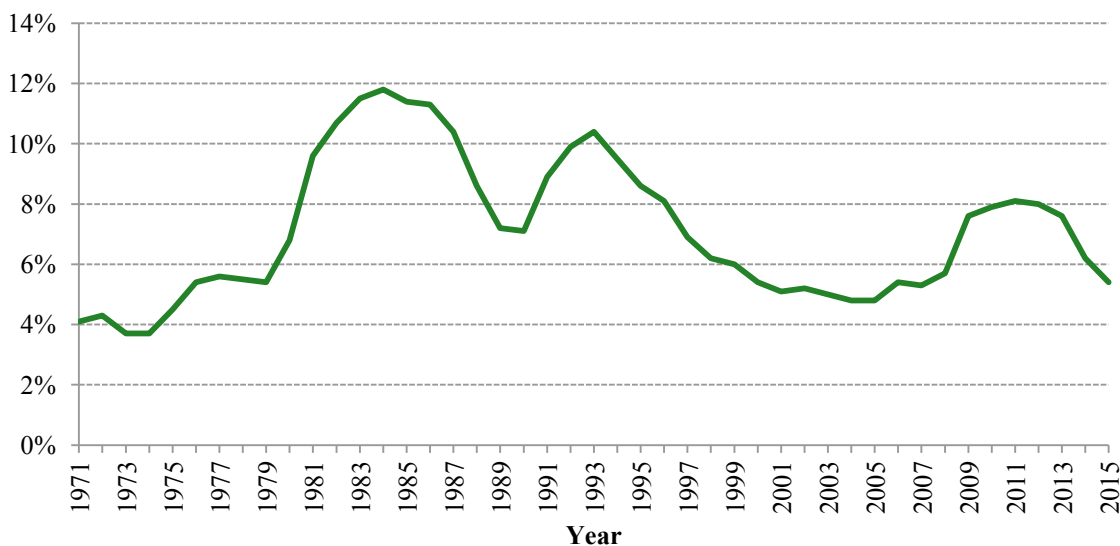
We use the derived income variables available in the data sets, which construct consistent measures of income from different sources before and after tax. These are constructed by the UK's Office for National Statistics (ONS) for the FES and its successors and by the Department for Work and Pensions (DWP) for the FRS. The derived household income variables based on the FRS are also published separately in a data set known as 'Households Below Average Income' (which, despite the name, includes households of all income levels), and this underpins the official UK statistics on poverty and the income distribution.

We are interested in the impact of the state of the economy at the point at which individuals enter the labour market and how persistent those impacts are. We use the national unemployment rate as the measure of the state of the economy faced by individuals entering the labour market. We also show the robustness of our key results to using a different measure of the economy – the estimated output gap (as a percentage of potential GDP), which is constructed by the government's official and independent forecaster, the Office for Budget Responsibility (see Appendix Table 4).

The measure of unemployment is constructed on a consistent basis under the International Labour Organisation (ILO) definition of unemployment since 1971 by the Office for National Statistics, and its evolution since 1971 is shown in Figure 1. It can be seen that there has been a large amount of cyclical variation over this period, including three major recessions and the recoveries from them: the

first in the early 1980s, with unemployment peaking at 11.8% in 1984; the second in the early 1990s, with unemployment peaking at 10.4% in 1993; and the third being the ‘Great Recession’ in which unemployment rose to 8.1% in 2011. On average, the increase in the unemployment rate between the year before the recession and the peak in unemployment is around 4 percentage points.

Figure 1. Unemployment rate in the UK



We use the FES and FRS data to look at scarring impacts on a set of different outcomes. First, we examine the probability of individuals being in paid employment and the weekly gross earnings of those who are employed or self-employed. We then look at a set of ‘family-level’ variables – gross earnings of those families with an adult in work, total private income (before taxes are paid and state transfers received), and total net (post-tax-and-state-transfers) income. The definition of a ‘family’ here is important: it is defined narrowly as an individual, their cohabiting partner (if they have one) and any dependent children of that individual/couple. In the UK, this is sometimes known as a ‘benefit unit’, reflecting that it is the unit used to assess entitlements to means-tested benefits; it is essentially equivalent to a US ‘tax unit’. Hence ‘families’ in this sense do not necessarily contain all members of a household, or even all related members of a household.

We then examine the same variables at the household level. The household can differ from the ‘family’ if two or more ‘families’ live together. Examples of this would be adult children living with their parents, as well as two (or more) adults living together in a house where they do not form a cohabiting relationship/partnership. When we measure household net income, we equalise using the

OECD modified equivalence scale, as this is as a standard income-based measure of household living standards (though equivalisation makes a negligible difference to our results). Using the FES data, we also look at total (equivalised) household expenditure. This includes both durable and non-durable expenditures and housing expenditures.

All financial amounts are adjusted for inflation and expressed in 2015–16 (the financial year running from April 2015 to March 2016) prices. We adjust for inflation using a modified version of the Consumer Prices Index (which additionally incorporates owner-occupied housing costs). This is the same measure of inflation as DWP uses when constructing its statistics on the income distribution. For all financial variables, we trim the bottom and top 1% of the sample in each year and exclude those observations from the analysis that uses those variables.

We select our sample (from both the FRS and FES data) based on the following criteria. Each individual must have left education between their compulsory school-leaving age (which varies by birth year) and age 25; they must have left education since 1971 (because we only observe the national unemployment rate from this year); and we keep observations for these individuals if they are within 10 years of having left education. We include people who are observed in the same calendar year as they left education (which we call ‘zero’ years since leaving education), as long as the observation is in July–December (final school examinations, plus almost all university courses, finish by July). This gives a total sample size of 198,734 individuals.

Table 1 shows the means of each of the outcomes of interest in the pooled FES/FRS sample, for each of the first 10 years after leaving education. Financial variables are shown in pounds sterling in 2015–16 prices. At the time of writing, £1 was worth around \$1.30 or €1.10. The table shows that, excluding the year individuals leave education, there is little change in the employment rate after leaving education. In comparison, the experience profile of earnings is steep, increasing from £247 per week in the year after leaving education to £371 per week four years later. A striking feature of the table is that, while (unequivalised) family-level earnings and incomes also grow steeply in the years after leaving education, household-level incomes and expenditures do not.

Table 1. Means of measures of employment, earnings, income and expenditure (£ per week, 2015–16 prices)

Years since left education	In paid work	Individual earnings for workers	For working families				For all families		
			Family earnings	Family private income	Family net income	H'hold private income	H'hold equiv. net income	H'hold equiv. net income	Total equiv. expenditure
0	0.61	204	242	248	210	930	526	465	428
1	0.74	247	298	303	248	936	536	485	437
2	0.77	284	360	366	293	928	542	496	445
3	0.77	318	422	429	339	916	549	501	443
4	0.77	346	487	495	387	902	558	510	443
5	0.77	371	537	545	426	887	565	516	443
6	0.76	392	587	595	464	862	564	517	442
7	0.76	404	618	627	492	848	564	519	441
8	0.77	421	657	668	524	841	567	523	446
9	0.76	428	680	692	543	830	562	522	451
10	0.76	442	706	719	565	830	563	522	447

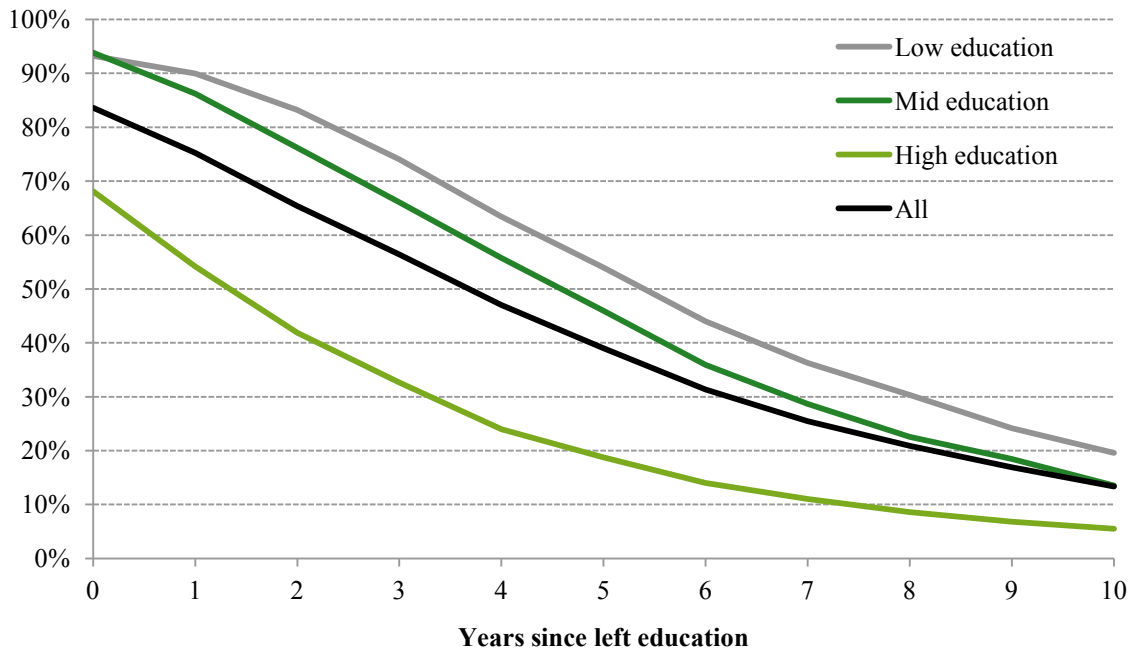
Note: 'equiv.' variables are equivalised using the OECD modified equivalence scale and expressed as the equivalent for a childless couple. Inflation is adjusted for using a modified version of the Consumer Prices Index that includes owner-occupied housing costs.

Source: Authors' calculations using the FRS and FES (and successors) from 1978 to 2015.

The main reason for this can be seen from Figures 2 and 3, which show respectively the percentage of individuals living in the same household as their parents and the percentage living with a partner or spouse, by years since leaving education, and how that varies for different education groups in each case. Pooling all the data used in our analysis, one year after leaving education 75% of individuals lived with their parents and 39% did even five years after. Low-educated individuals are particularly likely to live with their parents, with 90% doing so a year after leaving education and 54% doing so five years after. The lower percentage for higher-educated individuals is driven by the fact that they enter the labour market at an older age.

In comparison, relatively few people live with a cohabiting partner soon after leaving education, though of course the fraction increases with time. One year after leaving education, 16% cohabit with their partner, with 44% doing so five years after and 67% 10 years after. Higher-educated people are more likely to be living with partners in the years after leaving education, again at least in part driven by the older age at which they leave education.

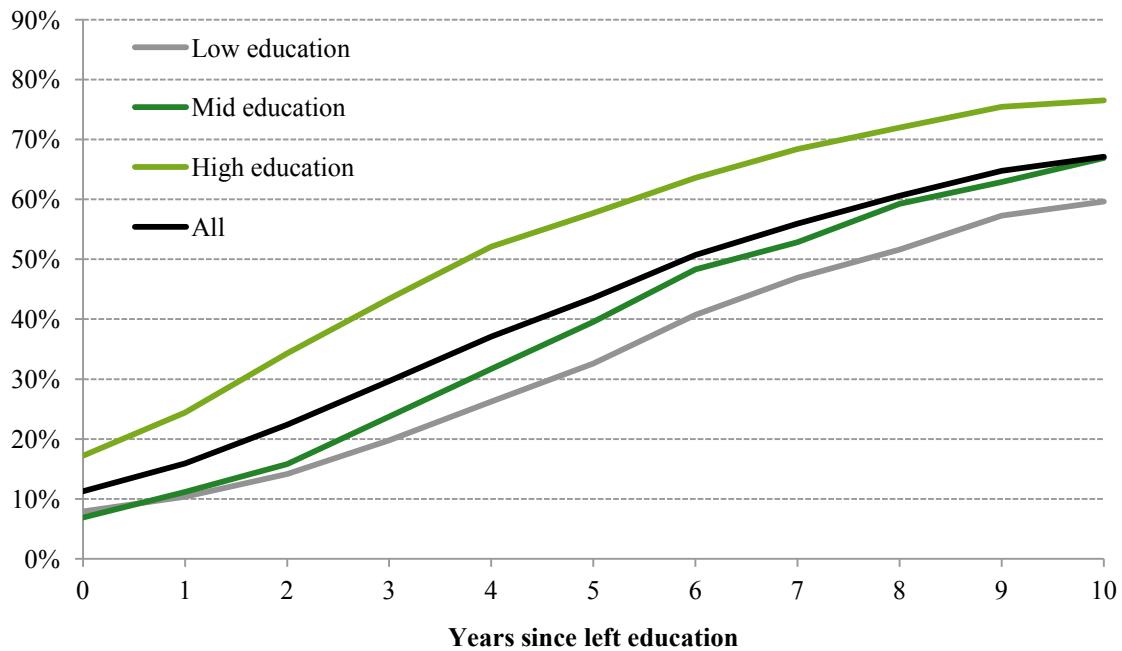
Figure 2. Percentage of individuals living in same household as their parents, by years since left education



Note: Low education – left education at age 16 or younger. Mid education – left education at age 17 or 18. High education – left education between ages 19 and 25.

Source: Authors’ calculations using the FRS and FES (and successors) from 1978 to 2015.

Figure 3. Percentage of individuals living with a cohabiting partner or spouse, by years since left education



Note: Low education: left education at age 16 or younger. Mid education: left education at age 17 or 18. High education: left education between ages 19 and 25.

Source: Authors’ calculations using the FRS and FES (and successors) from 1978 to 2015.

3. Empirical methodology

We estimate the impact of entering the labour market when unemployment is high by exploiting variation in unemployment rates in the UK since 1971. This period includes three large recessions, and the recoveries from them, during which the unemployment rate varies substantially even over short periods, as depicted earlier in Figure 1. For example, someone leaving education in 1979 faced an unemployment rate of only 5.4%, whereas someone leaving education two years later in 1981 faced an unemployment rate of 9.6%.

Using repeated cross-sections of pooled micro-data from the FRS and the FES, we estimate the following model for different outcomes:

$$y_{ict} = \alpha + \sum_{s=0}^2 \sum_{e=0}^{10} \gamma_{es} 1[\textit{experience} = e] \times 1[\textit{educ} = s] + \sum_{e=0}^{10} \beta_e [\textit{unemp_lefted}_c] \times 1[\textit{experience} = e] + f(\textit{yearlefted}_c) + \mu_t + \theta X_{ict} + \varepsilon_{ict} \quad (1)$$

where y_{ict} is an outcome (such as log household net income) for an individual i who belongs to year-left-education cohort c and who is observed at time t . The outcome of interest is allowed to depend on a full set of interactions between experience years (measured as years since left education) and education level (*experience* and *educ*).² We find the complete flexibility in experience gradients (for each education group) to be important in this context, as it is difficult to accurately capture the experience profiles of earnings right at the very start of a career with low-order polynomials. The outcome is also potentially affected by the unemployment rate in the year the individual left education (*unemp_lefted*), with the effect potentially varying with the number of years since the individual left education ('experience') to allow for scarring effects to fade over time. The estimated coefficients on these variables, β_e , are the coefficients of primary interest.

² The three-category measure of education is defined in the following way: low education – left education at age 16 or younger; mid education – left education at age 17 or 18; and high education – left education between ages 19 and 25.

An important control is $f(\text{yearlefted}_c)$, which allows for underlying cohort effects independent of unemp_lefted (which also varies at the cohort level). The functional form we use is a set of ‘five-year cohort’ dummy variables based on when the individual left education, i.e. there is one dummy for people leaving education between 1978 and 1982, another for those leaving education between 1983 and 1987, and so forth.³ These cohort variables control for any fixed unobservable differences between the five-year cohorts (recall that we are already controlling explicitly for differences in the level of education, measured at the individual level, which is a key observable that differs across cohorts). This is much less restrictive than imposing a more rigid parametric functional form such as a linear or quadratic cohort trend. The result of including these five-year cohort dummy variables is that, although we use a long time series of data, identification effectively comes from comparing sets of cohorts that graduated relatively close together. For example, differences between the economic outcomes of those who entered the labour market in 1979 and those who entered in 1981 will drive our results, as will differences between those who entered in 2008 and 2010, but differences between those entering the labour market in 1979 and 2010 will not. The logic underlying this identification strategy is that the economic cycle can and does change quickly, whereas other underlying cohort differences do not. Therefore, cohorts close together but who potentially experience different economic starting conditions can be used to identify scarring effects. Our results are all robust to using different five-year cohort groupings.

We also control for the year that each individual in the data is observed (μ_t). This has an important impact on the interpretation of the coefficients of interest, β_e : we estimate the persistent impacts of having entered the labour market when unemployment is high, after stripping out the effect of the economic conditions at the point that people are observed (which might be correlated with the starting conditions). Note that, although we strip out the potentially confounding effects of *current* conditions, we do not separately estimate scarring effects from the entire history of a cohort’s years in the labour

³ We choose to define our five-year cohorts as 1978–82, 1983–87 and so forth because 1978 is the first year of data, and so it is the first cohort for which we observe individuals in each of the first 10 years after leaving education. Fortunately, this also means that periods of high unemployment / low unemployment do not systematically appear at the beginning/end of our five-year cohorts, which could be concerning if there were some gradual cohort trend that was not picked up by the five-year dummies that we use. Our results reported in Section 4 are robust to changing the boundaries between five-year cohorts.

market: we control only for the initial conditions and current ones, and nothing in between. Hence the interpretation of β_e is as explained in Oreopoulos et al. (2012): the estimated scarring effect of having had worse initial conditions, inclusive of any persistent impact from the regular evolution of the economy faced after those bad initial conditions.

In X_{ict} , we control for a small number of other control variables that are plausibly exogenous to the economic conditions at the point people enter the labour market. These are sex and a dummy variable indicating whether the mandatory minimum school-leaving age was 16 rather than 15 (a change that affected those born in the academic year 1957–58 and afterwards) – a change which previous research has shown significantly increased the education and earnings of those affected (see Harmon and Walker (1995)). Finally, we include dummy variables to control for any systematic differences between the FRS and FES (differences which in fact are very small) in our pooled data set, allowing such differences to vary over time by interacting them with year.

We first estimate equation (1) using the individual labour market outcomes focused on in the literature to date: employment probabilities and the (log) weekly earnings of those in paid employment or self-employment. These can be thought of the ‘direct’ labour market impacts of entering the labour market in a recession. We then seek to extend our understanding of the impacts of scarring on living standards by incorporating the various potential insurance mechanisms, moving through a sequence of outcome variables as described below.

We look at the (log) pre-tax earnings of the family (i.e. the individual and their cohabiting partner), so we can assess whether partners mitigate any of the impacts. It is, of course, only possible to estimate this for those living in a family with at least one adult in work. For clarity, we therefore keep that same sample – families with an adult in work – as we move through the next set of outcomes, so as not to conflate the effects of insurance with the effects of changing the sample, before adding in the workless families in a final step at the end.

Keeping the same sample of working families, we then estimate the impact on log family private income (examining the insurance provided by any unearned private income – importantly excluding

state transfers), log family net income (examining the insurance provided by the tax and transfer system) and log household income measured both private and net (examining insurance provided by other members of the household). We then add the workless families back into the sample when showing the impact on log net household income, before finally considering log total expenditure. Comparing effects on household income and expenditure should allow us to understand the ability of borrowing or drawing down on assets to provide individuals with insurance. We equalise both net household incomes and expenditures, although this does not materially affect any of the results. These latter outcomes are the standard ones used in the empirical economics literature on household living standards, allowing us to bridge the gap between this and the scarring literature. In each case, we estimate equation (1) using ordinary least squares (OLS). All standard errors reported in this paper are robust to heteroskedasticity.

Of course, to some extent, individuals may be able to choose the point at which they leave education and join the labour market, and the state of the labour market may influence that decision. This raises two potential issues for our empirical strategy. First, it could affect the educational composition of labour market entrants at different stages of the economic cycle. We control for education level, so our results should be interpreted as net of any indirect impacts of the economic cycle on earnings via education. Second, the composition of labour market entrants may be correlated with the state of the economy with respect to unobserved factors. For example, if the delay of labour market entry in reaction to a recession were concentrated among those with lower ability, those entering the labour market at that time would have relatively high ability and this would attenuate the estimated scarring effects.

We have two main pieces of evidence for why this second issue is not a problem in practice. First, selection of this kind would presumably lead to permanent unobserved differences between cohorts (since cohorts are fixed from the point of leaving education). However, as reported in Section 4, our estimated scarring effects on labour market outcomes fade to zero once we follow cohorts for enough years. Hence this looks inconsistent with material selection on unobservables. Second, as found in Altonji et al. (2016), the magnitude of the effect of the cycle on education decisions is simply too

small to cause substantial biases in our results.⁴ Exploiting time-series variation in the unemployment rate at different ages, we estimate the effect of the unemployment rate at ages 16 and 18 on the probability of remaining in education past those ages (see Appendix 1 for details). We estimate that a 4 percentage point (ppt) increase in unemployment increases the probability of staying on in education for 16-year-olds by 1.3ppts. Effects of this magnitude (or even significantly bigger effects) could not plausibly lead to cohorts graduating in recessions having such different unobservable characteristics as to significantly bias our results.

4. Results

4a. Effects of entering the labour market when unemployment is high on measures of employment, earnings, income and expenditure

Table 2 reports the estimated effect that a 4 percentage point increase in the unemployment rate has on all of our outcomes of interest in each of the 10 years after leaving education, based on the specification in equation (1). We report the effect of a 4ppt rise in unemployment because, as noted in Section 2, this is the average increase in unemployment that has occurred during the last three recessions in the UK.⁵

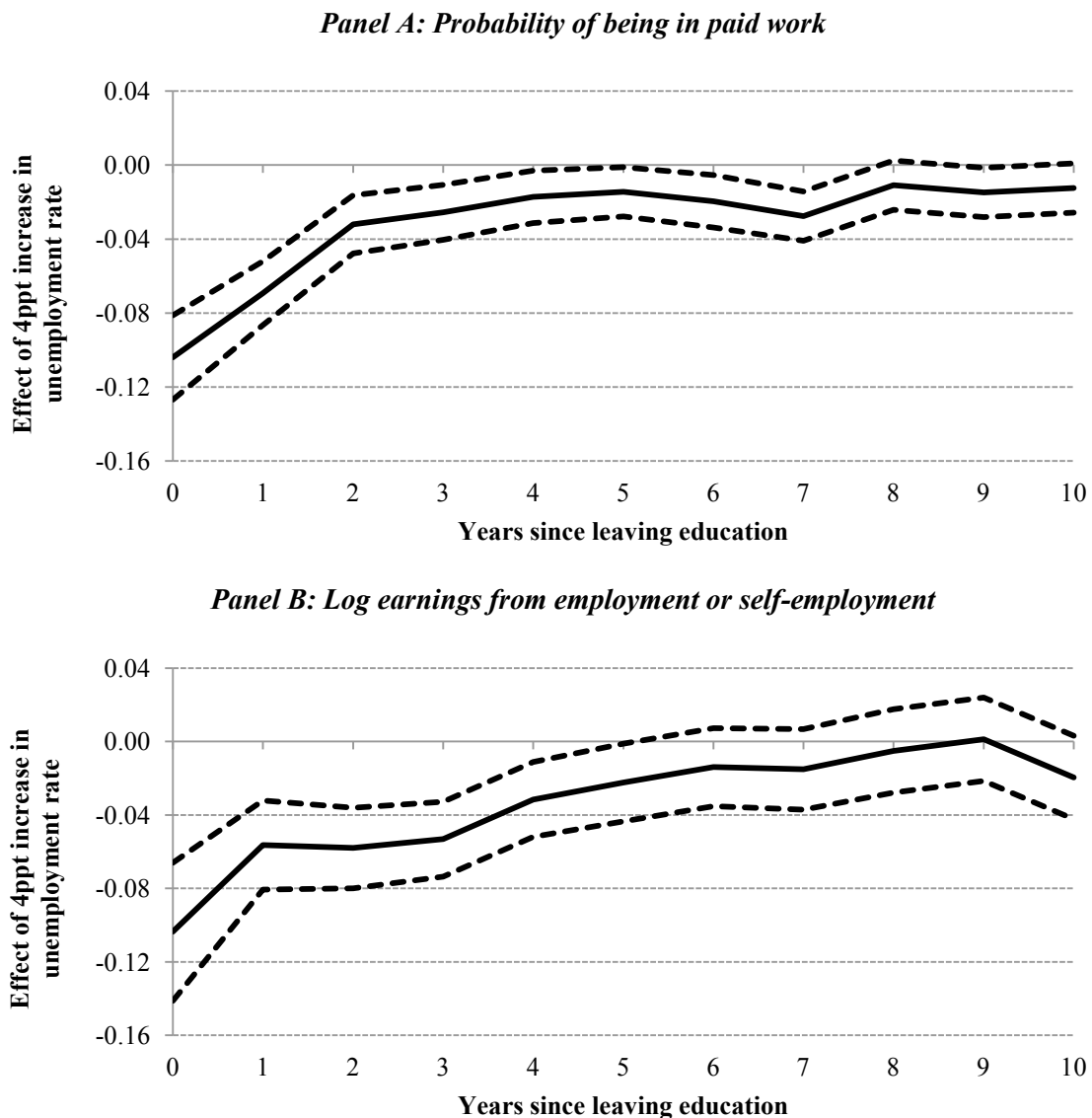
The first two columns of Table 2 show the effect of higher unemployment upon entering the labour market on the probability of being in paid work and on the (log) earnings of workers (including self-employed earnings). These coefficients are also plotted in Figure 4, along with the 95% confidence intervals. A 4ppt increase in the initial unemployment rate leads to a decreased probability of being in paid work of 10.4ppts in the year of leaving education. The magnitude of this effect falls rapidly, to

⁴ Other authors have used alternative strategies to address this potential issue. Bell et al. (2017) examine the effect of unemployment at a fixed age (16) on the likelihood of committing crimes. But with over 35% of those born in the early 1980s completing a degree, using a fixed age would mean accepting a very large amount of measurement error in economic conditions at labour market entry, attenuating the estimated effects. Kahn (2010) uses year of birth as an instrument for the year individuals left education, and age as an instrument for experience. However, in our sample of people in the first 10 years after leaving education, those who are older are also more educated, so the exclusion restriction would not hold and therefore this is not a valid instrument in this context.

⁵ In Appendix Table 4, we show that these results are robust to a slightly different measure of the state of the economy upon leaving education; it looks at the impact of the output gap (positive meaning output is above trend) on the same outcomes.

3.2ppts two years after leaving education. There are small, but mostly statistically significant, negative impacts of between 1 and 2 percentage points on the probability of being in paid work between 4 and 10 years after leaving education. There are also large negative impacts on the earnings of workers, which persist for a few years. A 4ppt increase in the unemployment rate at labour market entry reduces the weekly earnings of workers by 10.4% on average. This large impact dissipates slowly, with a 5.8% negative impact after two years and a 2.2% impact after five years. After this, the effects fade towards zero and are no longer statistically significant.

Figure 4. Effect of a 4 percentage point increase in unemployment rate upon leaving education on labour market outcomes



Note: Effects are obtained by estimating equation (1) by OLS with a dummy variable for employment (Panel A) and log gross weekly earnings (Panel B) as the dependent variable. Dashed lines are the 95% confidence intervals.
 Source: Authors' calculations using Family Resources Survey and Family Expenditure Survey from 1978 to 2015.

Table 2. Effect of a 4 percentage point rise in unemployment rate upon leaving education on measures of employment, earnings, income and expenditure

Effect, by years since left education	For working families only						For all families			
	In paid work	Log individual earnings of workers	Log family earnings	Log family private income	Log family net income	Log household private income	Log equivalised net household income	Log equivalised net family income	Log equivalised net household income	Log equivalised total expenditure
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
0	-0.104*** (0.012)	-0.104*** (0.019)	-0.095*** (0.019)	-0.098*** (0.018)	-0.063*** (0.016)	-0.016 (0.022)	0.012 (0.012)	-0.036* (0.018)	0.002 (0.011)	-0.014 (0.014)
1	-0.069*** (0.009)	-0.056*** (0.012)	-0.045*** (0.013)	-0.045*** (0.013)	-0.022* (0.011)	-0.002 (0.015)	0.008 (0.009)	-0.065*** (0.012)	0.001 (0.009)	-0.020 (0.013)
2	-0.032*** (0.008)	-0.058*** (0.011)	-0.071*** (0.012)	-0.071*** (0.012)	-0.050*** (0.010)	-0.020 (0.014)	-0.005 (0.008)	-0.055*** (0.011)	-0.016* (0.009)	-0.016 (0.012)
3	-0.026*** (0.008)	-0.053*** (0.010)	-0.066*** (0.012)	-0.068*** (0.011)	-0.045*** (0.010)	-0.024* (0.013)	-0.015* (0.008)	-0.053*** (0.010)	-0.026*** (0.008)	-0.028** (0.012)
4	-0.017** (0.007)	-0.032*** (0.010)	-0.026** (0.011)	-0.025** (0.011)	-0.013 (0.010)	-0.006 (0.012)	0.002 (0.008)	-0.022** (0.010)	-0.013 (0.008)	-0.026** (0.012)
5	-0.014** (0.007)	-0.022** (0.011)	-0.039*** (0.011)	-0.040*** (0.011)	-0.024** (0.010)	-0.010 (0.012)	-0.000 (0.008)	-0.023** (0.010)	-0.010 (0.008)	-0.004 (0.012)
6	-0.020*** (0.007)	-0.014 (0.011)	-0.020* (0.011)	-0.019* (0.011)	-0.012 (0.010)	-0.016 (0.012)	-0.007 (0.008)	-0.018* (0.010)	-0.027*** (0.009)	-0.024** (0.012)
7	-0.028*** (0.007)	-0.015 (0.011)	-0.015 (0.011)	-0.015 (0.011)	-0.007 (0.010)	-0.015 (0.012)	0.006 (0.008)	-0.029*** (0.010)	-0.016* (0.008)	-0.012 (0.012)
8	-0.011 (0.007)	-0.005 (0.012)	-0.018 (0.011)	-0.015 (0.011)	-0.011 (0.010)	0.008 (0.012)	0.009 (0.008)	-0.013 (0.010)	-0.002 (0.008)	0.010 (0.012)
9	-0.015** (0.007)	0.001 (0.012)	-0.003 (0.011)	-0.002 (0.011)	-0.005 (0.010)	0.004 (0.011)	0.012 (0.008)	-0.015 (0.010)	-0.004 (0.008)	-0.004 (0.013)
10	-0.012* (0.007)	-0.020* (0.012)	0.001 (0.011)	0.005 (0.011)	0.002 (0.009)	0.002 (0.011)	0.011 (0.008)	-0.007 (0.010)	-0.004 (0.008)	-0.015 (0.013)
Observations	198,734	145,859	158,021	157,841	157,036	156,904	156,076	188,122	193,805	71,272

Note: Effects are obtained by estimating equation (1) by OLS with the specified dependent variables. *** indicates that the effect is statistically different from zero at the 1% level, ** at the 5% level and * at the 10% level.

Source: Authors' calculations using Family Resources Survey and Family Expenditure Survey from 1978 to 2015.

The effects on earnings are similar in magnitude to those estimated among US and Canadian graduates by Altonji et al. (2016) and Oreopoulos et al. (2012) respectively, though smaller than the effects estimated among US graduates by Kahn (2010). Our estimates for employment are quite similar to those from European studies that, like us, use the whole population (such as Burgess et al. (2003), Raaum and Røed (2006) and Schmillen and Umkehrer (2013)), and smaller than the effects typically found among North American graduates.

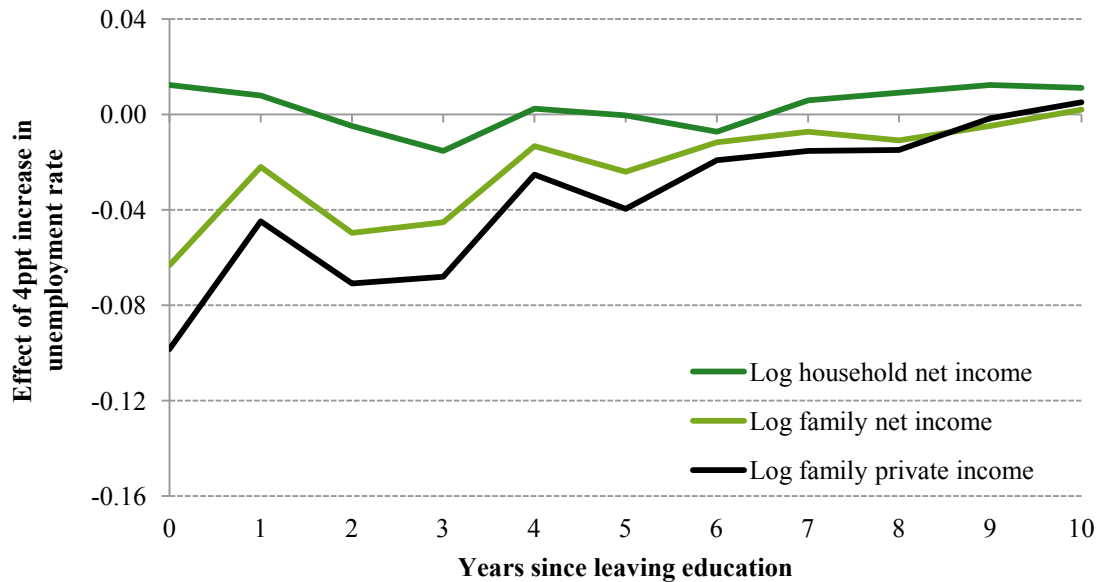
Columns 3 and 4 of Table 2 show the effects on log (pre-tax) family earnings and on log family private income (i.e. after adding in unearned income other than state transfers, which tends to be small). As explained in Section 3, these results – and the next few that follow – are for the common sample of individuals in a family where at least one member is in paid work, so that the comparison of results across outcome variables isolates the impacts of insurance rather than being partly a result of sample changes. The results show that the initial unemployment rate has negative effects on both family earnings and family private income that persist until around five years after leaving education – the same as for individual earnings of workers. After three years, both measures are around 7% lower as a result of a 4ppt higher initial unemployment rate. Given what we have seen, it is unsurprising that moving from the individual to the family level makes little difference: few people live with a partner with whom they can pool resources shortly after leaving education.

However, columns 5 to 7 of the table, together with Figures 5 and 6, show that a combination of the tax and transfer system and the incomes of other members of the household (most importantly parents) acts to mitigate essentially all of the negative effects of entering the labour market in a recession on net household income.

Taking first the insurance provided by the tax and transfer system, Figure 5 shows that, three years after leaving education, family net income is 4.5% lower as a result of a 4ppt increase in the initial unemployment rate, whereas family private income is 6.8% lower. This difference is the result of lower direct tax payments and higher means-tested transfers. In addition, even where entitlements to transfers are not increased by lower earnings, the mere existence of another source of income besides earnings acts to attenuate the proportional effects on income of lower earnings. However, the scarring

effect on net family income is still clear and persistent: the estimate is both negative and statistically significant for around five years.

Figure 5. Effect of a 4 percentage point increase in unemployment rate upon leaving education on log family private income, log family net income and log household net income of working families



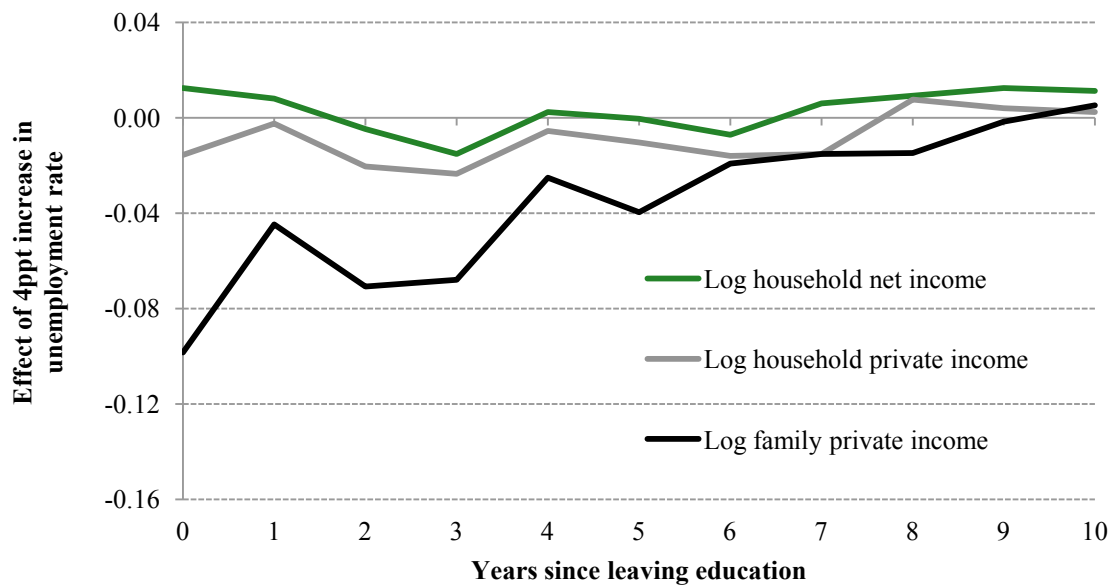
Note: Effects are obtained by estimating equation (1) by OLS with the specified dependent variables. See Table 2 for standard errors around the estimated effects.

Source: Authors' calculations using Family Resources Survey and Family Expenditure Survey from 1978 to 2015.

In contrast, Figure 6 (and column 6 of Table 2) shows that the incomes of other members of the household (outside the family) seem to provide large amounts of insurance against the negative impacts on labour market outcomes. Negative effects on household private income are much smaller than the effects on family private income, both in the period immediately after leaving education (when effects on earnings are largest) and at the end of the period of 'scarring' on family income around five years later.

Once both the tax and transfer system and the incomes of other household members are added in, by looking at net household income, impacts of entering the labour market at a time of unemployment are no longer significant.

Figure 6. Effect of a 4 percentage point increase in unemployment rate upon leaving education on log family private income, log household private income and log household net income of working families



Note: Effects are obtained by estimating equation (1) by OLS with the specified dependent variables. See Table 2 for standard errors around the estimated effects.

Source: Authors' calculations using Family Resources Survey and Family Expenditure Survey from 1978 to 2015.

If we broaden the sample so that we include families in which no adults in work, as in column 9 of Table 2, some negative impacts on net household income are apparent, which is not surprising given that there are small but persistent negative impacts on the probability of being in paid work. Nevertheless, the effects are small relative to those on employment and earnings, and only in a small number of years are they statistically significant. Impacts on household expenditures are very similar to those on net household incomes, as shown in column 10.

A comparison of the results in column 9 with those in column 8, which shows the effects on net *family* income for all individuals, again highlights the importance of the potential safety net provided by parents. There are sizeable – and statistically significant – negative effects of entering the labour market in a recession on net family income, particularly in the first five years after leaving education. Hence in cases where the degree of resource pooling within households is weak, there would still be good reasons to be concerned about the living standards of young adults scarred in the labour market who live with their parents. If, on the other hand, one thinks that parents are likely to pool their income with that of their co-resident children, then net household income and expenditure are good

proxies for material standards of living, and this would imply that the impacts on young adults' living standards are insured against to a very large degree. There is an important and sharp contrast between these highly muted effects on typical measures of living standards and the large persistent effects of bad initial conditions on labour market outcomes examined in previous work.

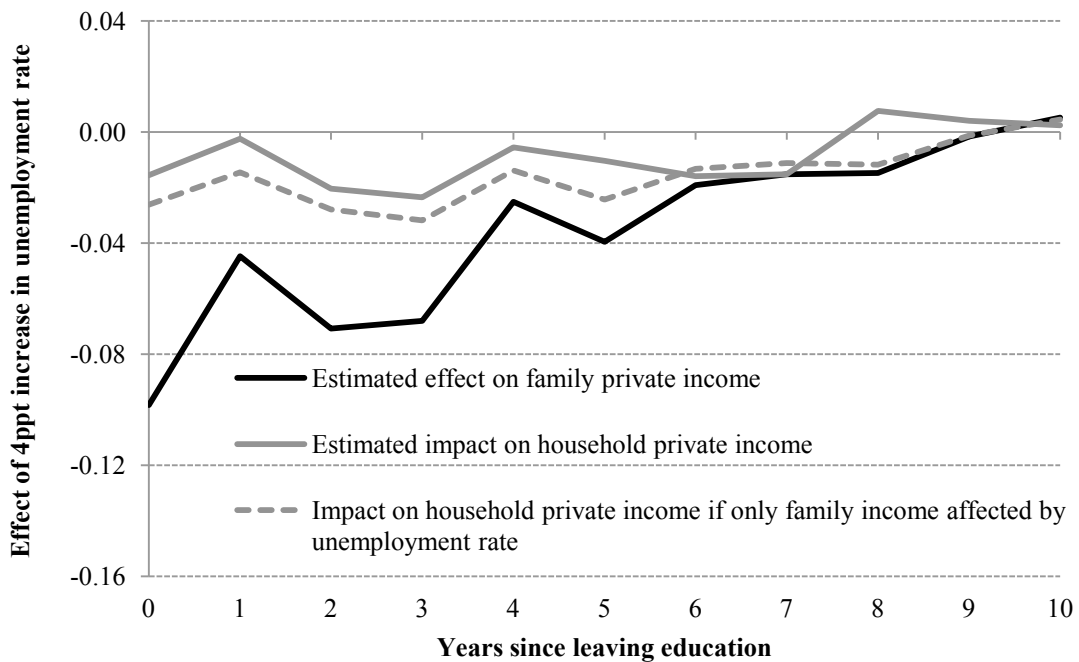
4b. Understanding the insurance mechanisms and their interaction with heterogeneity

In this subsection, we explore how income from other household members plays such an important insurance role. When doing so, it is important to note that of those young adults in our data who live in a household with people other than their partner (and their dependent children), the large majority (82%) live with their parents. This proportion is even higher (87%) for those who left education within the last three years. There are three potential ways in which this insurance from other household members might work. First, there is a mechanical, non-behavioural 'dilution' effect: where a substantial amount of income in a young adult's household comes from other household members, proportional impacts on total household income of falls in their own income will be attenuated. Second, leaving education during a recession may encourage more young adults to live with their parents (by staying in the parental home longer, or even returning to their parents' home), thereby boosting the household incomes of some affected children. Third, even for those individuals who would have been living with their parents anyway, parents might increase their earnings to help make up for the lower amount earned by their child. Of course, these three mechanisms are not mutually exclusive.

Figure 7 shows that the first, mechanical explanation is the most important. The figure presents the estimated impact on (log) family private income and (log) household private income as shown in Table 2. In addition, the dashed grey line shows what the mechanical impact on household private income would be if only family private income were affected by the initial unemployment rate. This is calculated by multiplying the share of household private income coming from family private income at each experience year (see Table 1) by the estimated effect of the initial unemployment rate on family private income at each experience year shown in Table 2. The share of household income coming from outside the 'family' is high, making up 61% of household income for individuals two

years after leaving education. As a result, the mechanical ‘diluting’ effect of the income of other household members explains almost all of the difference between the proportional effects on family incomes and household incomes.

Figure 7. Mechanical impact on household private income for working families if only family income is affected by unemployment rate at point of entering labour market



Note: Effects on (log) family and (log) household private income are obtained by estimating equation (1) by OLS with the specified dependent variables. See Table 2 for standard errors around the estimated effects. The dashed line is calculated by multiplying the share of household private income coming from family private income at each experience year (see Table 1) by the effect of the initial unemployment rate on family private income at each experience year shown in Table 2. Source: Authors’ calculations using Family Resources Survey and Family Expenditure Survey from 1978 to 2015.

Given that not everyone does (or has the ability to) live with their parents after leaving education, how is the insurance provided by the rest of the household so complete, even *on average*? This is where the interaction between heterogeneity in the labour market impacts and heterogeneity in insurance becomes important. Table 3 shows that the low-educated see the largest negative effects on family private income. Appendix Table 2 confirms that the relatively large effects on family incomes are indeed driven by employment and earnings effects being larger for low-educated individuals. This mirrors the findings of Burgess et al. (2003) for employment and Haaland (2017) for wages.

Table 3. Effect of a 4 percentage point increase in unemployment rate upon entering labour market on family and household private incomes (in working families) by education group

Effect, by years since left education	Low education		Mid education		High education	
	Log family private income	Log household private income	Log family private income	Log household private income	Log family private income	Log household private income
0	-0.114*** (0.027)	-0.020 (0.036)	-0.085*** (0.033)	0.023 (0.036)	-0.066* (0.038)	-0.036 (0.038)
1	-0.016 (0.019)	0.012 (0.026)	-0.115*** (0.024)	0.010 (0.028)	0.005 (0.025)	-0.024 (0.026)
2	-0.086*** (0.018)	-0.023 (0.024)	-0.077*** (0.022)	0.007 (0.026)	-0.032 (0.023)	-0.038* (0.022)
3	-0.064*** (0.017)	-0.009 (0.022)	-0.085*** (0.022)	-0.019 (0.025)	-0.039* (0.022)	-0.041* (0.021)
4	-0.040** (0.017)	-0.004 (0.021)	-0.040* (0.022)	0.013 (0.024)	0.024 (0.022)	-0.018 (0.020)
5	-0.038** (0.017)	-0.010 (0.020)	-0.063*** (0.022)	0.004 (0.023)	-0.002 (0.020)	-0.017 (0.019)
6	-0.018 (0.017)	-0.002 (0.020)	-0.058*** (0.022)	-0.032 (0.023)	0.036* (0.020)	-0.006 (0.019)
7	-0.006 (0.017)	0.015 (0.019)	-0.014 (0.022)	-0.023 (0.023)	0.009 (0.020)	-0.019 (0.019)
8	-0.010 (0.017)	0.028 (0.019)	-0.012 (0.022)	0.022 (0.023)	0.020 (0.020)	0.004 (0.019)
9	0.012 (0.017)	0.028 (0.019)	0.010 (0.022)	0.016 (0.022)	0.021 (0.020)	0.006 (0.019)
10	0.048*** (0.017)	0.037** (0.018)	-0.013 (0.022)	0.022 (0.022)	0.011 (0.020)	-0.015 (0.019)
Observations	53,680	53,463	41,526	41,245	62,635	62,196

Note: Effects are obtained by estimating equation (1) by OLS with the specified dependent variables on the subgroup specified. *** indicates that the effect is statistically different from zero at the 1% level, ** at the 5% level and * at the 10% level.

Source: Authors' calculations using Family Resources Survey and Family Expenditure Survey from 1978 to 2015.

However, it is precisely these low-educated individuals who are the most likely to live with their parents in the years after leaving education (see Figure 2). This means that the groups with the largest scarring effects on labour market outcomes (the low- and mid-educated) are the most likely to be insured by living with their parents.

This finding has three important implications. First, it helps to explain why the aggregate degree of insurance against scarring is so high even though a substantial share of the overall population of young adults do not live with their parents. Second, in terms of household private income, there are larger negative effects on the highly educated than there are on lower-educated individuals, despite the larger labour market impacts for the less educated, because many fewer high-educated individuals live with their parents. Third, living with parents would be less insuring against scarring impacts on

labour market outcomes if these effects were more persistent. As shown in Figure 2, only 13% of people live with their parents 10 years after leaving education; so if labour market scarring were more persistent, it would likely also have an effect on household incomes. However, on average, the labour market scarring is not so persistent that it outlasts a typical period for which individuals live with their parents.

Table 4 shows that there is no estimated effect on the probability that young adults live with their parents resulting from leaving education when unemployment is high.⁶ This implies that the reason for other household members insuring affected young adults is not due to an increased propensity to live with their parents. Not only are the effects not statistically significantly different from zero, but also the point estimates are very small and close to zero. There is, however, some very tentative evidence in column 3 that labour supply responses of parents may be playing a small role. One year after leaving education, among those individuals who live with their parents, a 4 percentage point rise in the initial unemployment rate is associated with a 0.035 rise in the number of parents in the household who are in paid work (significant at the 10% level). We find no significant impacts on the earnings of parents who are in work (column 4) with the single exception of a negative effect 10 years after leaving education.

In addition, column 1 of Table 4 shows why spousal labour supply is not an important insurance mechanism for young adults who leave education at a bad time (contrary to the results for the population as a whole found by Blundell, Pistaferri and Saporta-Eksten (2016)). Not only do relatively few people live with a partner after leaving education, but facing a higher unemployment rate upon leaving education leads to a persistently lower probability of living with a partner – effects which are significant between two and eight years after leaving education.

⁶ Note that the ‘scarring’ impact of high unemployment at labour market entry is estimating an effect that is distinct from the work by Kaplan (2012), who looks at individuals returning home to live with their parents when they face a contemporaneous economic shock.

Table 4. Effect of a 4 percentage point increase in unemployment rate upon entering labour market on living with partner, living with parents, and parents' employment and earnings

Effect, by years since left education	Pr(Live with a partner) (1)	Pr(Live with parents) (2)	Number of working parents (3)	Log parents' weekly earnings (4)
0	-0.008 (0.008)	-0.008 (0.008)	0.028 (0.022)	0.011 (0.023)
1	-0.009 (0.008)	-0.002 (0.008)	0.035* (0.019)	0.022 (0.020)
2	-0.026*** (0.008)	0.006 (0.008)	0.032* (0.018)	0.010 (0.020)
3	-0.042*** (0.008)	0.015 (0.008)	0.022 (0.018)	-0.008 (0.019)
4	-0.012 (0.008)	0.008 (0.008)	0.010 (0.019)	-0.004 (0.020)
5	-0.026*** (0.008)	0.003 (0.008)	0.027 (0.020)	-0.001 (0.022)
6	-0.008 (0.008)	-0.008 (0.007)	0.000 (0.022)	-0.004 (0.024)
7	-0.018** (0.008)	-0.008 (0.007)	-0.004 (0.024)	0.029 (0.026)
8	-0.020** (0.008)	0.009 (0.007)	0.022 (0.026)	-0.016 (0.028)
9	-0.015* (0.008)	0.005 (0.006)	0.021 (0.028)	-0.022 (0.031)
10	-0.001 (0.008)	-0.003 (0.006)	-0.023 (0.029)	-0.064** (0.032)
Sample restrictions:	All	All	All living with parents	All living with a working parent
Observations	198,734	198,734	79,194	63,221

Note: Effects are obtained by estimating equation (1) by OLS with the specified dependent variables on the samples shown.

*** indicates that the effect is statistically different from zero at the 1% level, ** at the 5% level and * at the 10% level.

Source: Authors' calculations using Family Resources Survey and Family Expenditure Survey from 1978 to 2015.

Of course, there are individuals who are scarred in the labour market and who do not live with their parents. Our results suggest that, in fact, that may be the group of most concern. Appendix Table 3 estimates the impact of the initial unemployment rate on those individuals in single-family households (who therefore do not live with their parents) on the same outcomes as in our results for the full sample in Table 2. For this group, there are substantial negative causal effects of the initial unemployment rate on household income and expenditure for approximately five years after leaving education. For example, three years after leaving education, a 4 percentage point rise in the initial unemployment rate results in an 8% fall in net household income and a 10% fall in expenditure. In other words, other insurance mechanisms – such as the tax and transfer system – insure these young adults' incomes only partially against the shock caused by entering the labour market at a bad time;

and the fact that this is passed through to expenditure suggests that individuals are unable to use savings (of which they probably have very few) or credit to smooth the impact on their consumption.

5. Conclusion

In this paper, we have estimated the causal impact of entering the labour market when the economy is weak, not only on the individual labour market outcomes focused on in previous research, but also on standard measures of material living standards – net household income and household expenditures. We have also studied a number of intermediate outcomes in order to isolate the key insurance mechanisms standing between labour market effects and impacts on living standards. For identification, we have exploited the economic cycle in the United Kingdom since the 1970s, which means that cohorts entering the labour market very close together can nevertheless face dramatically different initial economic conditions.

We concur with previous research in finding substantial impacts on the individual earnings and employment rates of young adults who leave education when unemployment is high. However, we find little or no impact on their net household incomes and household expenditures. There are two key reasons for this. First, the tax and state transfer system helps to partially cushion the impact of lower earned income. Second, and more importantly on average, many young adults live with their parents for some years after they enter the labour force (75% one year after leaving education and 39% five years after). Parental incomes tend to be far higher than those of their adult children, meaning that the proportional shock to household incomes caused by lower earnings of the young adult is typically very small where they live together. To understand why the degree of insurance provided by parental incomes is quite so large, the relationship between heterogeneity in labour market scarring and in insurance is key: labour market scarring tends to be bigger for the lowest-educated, but that is also the group that is most likely to live with their parents in the years after leaving education.

There are several reasons why policymakers should still be concerned about the impacts on young adults of leaving education during a recession. First, reduced earnings and employment are important outcomes in their own right. They lead to lower tax revenues and higher government spending on

means-tested transfer payments. National income will be lower if young adults are persistently out of work or less well matched with employers. The wider well-being of young adults may also be harmed simply by being out of work, or by being more dependent on their parents, irrespective of their household incomes or expenditures. Second, those who do not live with their parents do have lower household incomes as a result of the initial economic conditions they face, and we have shown that this reduces their expenditures too. Third, to be definitive about the impacts on living standards, we would need to know the degree of intra-household resource sharing where young adults live with their parents. The living standards of the young adults in these households may not always be the same as those of their parents.

Our results therefore lead us to suggest two fruitful areas of focus for further research in this area: the negative effect of entering the labour market during a recession on those young adults who do not live with their parents, and the degree to which resources are shared within households containing parents and their co-resident children.

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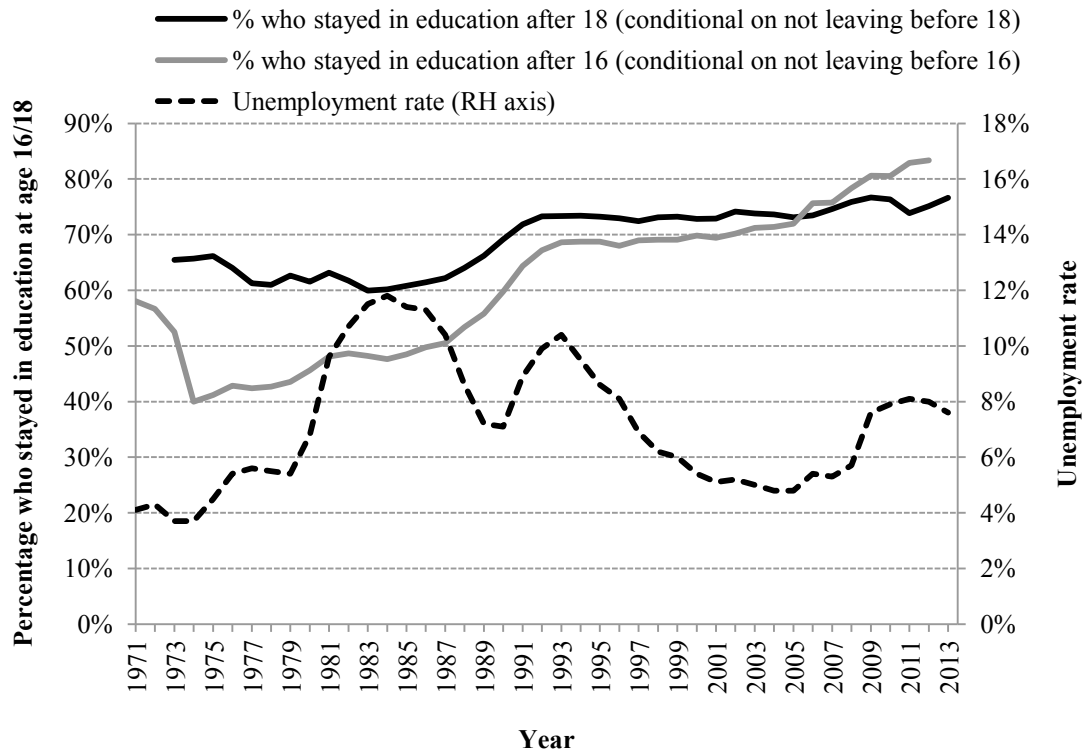
Appendix 1: Effect of unemployment rate on probability of remaining in education

As discussed in Section 3, one possible challenge to our empirical strategy is that individuals may change the age at which they leave education in response to the economic conditions at the point they are making that decision. Following Altonji et al. (2016), who look at the probability of remaining in university education after age 22, we estimate what impact the unemployment rate at age 16 and age 18 has on the probability of remaining in education after those ages. Appendix Figure 1 shows that it is important to account for the underlying trends of increasing participation in education. Two key determinants of the probability of staying on after age 16 have been policy related. First, the increase in the minimum school-leaving age to 16 in the early 1970s meant that, conditional on staying on until age 16, the probability of remaining in education afterwards fell. Second, the introduction of GCSEs (and replacement of O levels and CSEs) in 1988 meant that exam performance increased and the proportion who got the grades to stay on in education increased (see McVicar and Rice (2001) and Machin and Vignoles (2006) for more details). Given these policy-driven trends, it is important to control carefully for the cohort trends. Using a simple polynomial, or even the five-year cohort trends as used in the bulk of the paper, would not be appropriate in this case.

We therefore regress the probability of remaining in education on the unemployment rate at the relevant age, controlling for underlying cohort trends using a piecewise linear spline in year of birth that has four nodes, one of which (importantly) is in 1987 – the last year before GCSEs were introduced. We also include dummies for sex, the data set used (FRS/FES) and whether the individual had a minimum school-leaving age of 15 or 16. The results of this analysis, shown in Appendix Table 1, show that a 4ppt increase in the unemployment rate has a small, but significant, impact on remaining on in education, increasing the probability of staying on after age 16 by 1.3ppts and the probability of staying on after age 18 by 1.5ppts.⁷

⁷ It should be noted that while these effects are smaller than those estimated in some studies – such as Rice (1987) and Clark (2011) – our effects are estimated using the national unemployment rate, not local unemployment rates. These are slightly different conceptually. For example, in most of the period we examine, there were limited numbers of places in higher education for school leavers to take up. Therefore while higher unemployment in one area might encourage more people from that area to apply to higher education, it does not necessarily mean that more people nationally will undertake higher education.

Appendix Figure 1. Probabilities of individuals staying on in education at ages 16 and 18, by year, and unemployment rate



Note: Sample is all 20- to 24-year-olds observed in the FRS and FES between 1978 and 2015.

Appendix Table 1. Effect of a 4 percentage point increase in unemployment rate at age 16/18 on probability of staying on in education past those ages (conditional on not having already left education)

	Pr(Stay in education beyond age 16)	Pr(Stay in education beyond age 18)
Effect of 4ppt increase in unemployment rate at age 16	0.013** (0.005)	
Effect of 4ppt increase in unemployment rate at age 18		0.015* (0.008)
Sample size	96,598	50,087

Note: Sample is based on all 20- to 24-year-olds observed in FES and FRS data between 1978 and 2015. *** indicates that the effect is statistically different from zero at the 1% level, ** at the 5% level and * at the 10% level.

Appendix 2: Supplementary tables

Appendix Table 2. Effect of a 4 percentage point increase in unemployment rate upon entering labour market on labour market outcomes, by education group

Effect, by years since left education	Low education		Mid education		High education	
	In paid work	Log individual earnings of workers	In paid work	Log individual earnings of workers	In paid work	Log individual earnings of workers
0	-0.148*** (0.018)	-0.144*** (0.030)	-0.065*** (0.023)	-0.107*** (0.034)	-0.064*** (0.021)	-0.021 (0.037)
1	-0.078*** (0.014)	-0.032* (0.019)	-0.064*** (0.017)	-0.120*** (0.023)	-0.054*** (0.014)	-0.002 (0.023)
2	-0.011 (0.014)	-0.061*** (0.018)	-0.041*** (0.015)	-0.073*** (0.021)	-0.042*** (0.012)	-0.017 (0.020)
3	-0.028** (0.013)	-0.058*** (0.016)	-0.020 (0.014)	-0.081*** (0.019)	-0.022** (0.011)	-0.005 (0.019)
4	-0.002 (0.012)	-0.024 (0.016)	-0.046*** (0.014)	-0.052*** (0.019)	-0.012 (0.011)	0.000 (0.020)
5	0.006 (0.012)	-0.029* (0.017)	-0.035*** (0.014)	-0.031 (0.021)	-0.025** (0.010)	0.010 (0.019)
6	-0.012 (0.012)	-0.006 (0.017)	-0.038*** (0.014)	-0.033* (0.020)	-0.011 (0.011)	0.012 (0.019)
7	-0.029** (0.012)	-0.002 (0.017)	-0.038*** (0.014)	0.006 (0.022)	-0.009 (0.010)	-0.020 (0.020)
8	-0.005 (0.012)	-0.003 (0.018)	-0.008 (0.014)	0.000 (0.022)	-0.012 (0.011)	0.015 (0.021)
9	-0.006 (0.012)	0.013 (0.018)	-0.023* (0.014)	0.012 (0.022)	-0.014 (0.011)	0.012 (0.021)
10	-0.002 (0.012)	0.014 (0.018)	-0.029** (0.014)	-0.035 (0.022)	-0.005 (0.010)	-0.020 (0.020)
Observations	76,337	48,803	50,750	38,661	71,647	58,395

Note: Effects are obtained by estimating equation (1) by OLS with the specified dependent variables on the subgroup specified. *** indicates that the effect is statistically different from zero at the 1% level, ** at the 5% level and * at the 10% level.

Source: Authors' calculations using Family Resources Survey and Family Expenditure Survey, 1978 to 2015.

Appendix Table 3. Effect of a 4 percentage point increase in unemployment rate upon entering labour market on measures of employment, earnings, income and expenditure, for single-family households

Effect, by years since left education	For working families only						For all families			
	In paid work	Log individual earnings of workers	Log family earnings	Log family private income	Log family net income	Log household private income	Log equivalised net household income	Log equivalised net family income	Log equivalised net household income	Log equivalised total expenditure
0	-0.128*** (0.042)	-0.159** (0.074)	-0.176** (0.069)	-0.154** (0.066)	-0.116** (0.057)	-0.154** (0.066)	-0.035 (0.042)	-0.124** (0.055)	-0.095** (0.044)	-0.124* (0.065)
1	-0.054*** (0.020)	-0.016 (0.028)	-0.022 (0.033)	-0.026 (0.032)	-0.005 (0.027)	-0.028 (0.032)	0.002 (0.023)	-0.030 (0.026)	-0.030 (0.024)	-0.036 (0.037)
2	-0.047*** (0.015)	-0.049** (0.025)	-0.088*** (0.026)	-0.092*** (0.025)	-0.061*** (0.021)	-0.086*** (0.025)	-0.032* (0.018)	-0.083*** (0.020)	-0.083*** (0.018)	-0.049* (0.028)
3	-0.039*** (0.013)	-0.084*** (0.020)	-0.095*** (0.021)	-0.094*** (0.021)	-0.054*** (0.017)	-0.094*** (0.021)	-0.047*** (0.015)	-0.077*** (0.018)	-0.075*** (0.016)	-0.096*** (0.024)
4	-0.018 (0.012)	-0.046** (0.018)	-0.024 (0.018)	-0.021 (0.018)	-0.004 (0.015)	-0.020 (0.018)	-0.003 (0.014)	-0.026 (0.016)	-0.029** (0.014)	-0.070*** (0.021)
5	-0.014 (0.010)	-0.016 (0.018)	-0.031* (0.016)	-0.029* (0.016)	-0.015 (0.013)	-0.029* (0.016)	-0.003 (0.012)	-0.034** (0.014)	-0.026** (0.013)	-0.022 (0.018)
6	-0.022** (0.010)	-0.022 (0.016)	-0.024 (0.015)	-0.022 (0.015)	-0.010 (0.012)	-0.024 (0.015)	-0.010 (0.011)	-0.031** (0.013)	-0.037*** (0.012)	-0.038** (0.017)
7	-0.022** (0.009)	-0.035** (0.016)	-0.033** (0.014)	-0.032** (0.014)	-0.018 (0.011)	-0.032** (0.014)	0.000 (0.010)	-0.028** (0.012)	-0.028** (0.011)	-0.024 (0.016)
8	-0.008 (0.009)	-0.017 (0.016)	-0.024* (0.014)	-0.021 (0.014)	-0.011 (0.011)	-0.021 (0.014)	-0.006 (0.010)	-0.011 (0.012)	-0.016 (0.011)	-0.008 (0.016)
9	-0.011 (0.009)	-0.013 (0.015)	-0.016 (0.014)	-0.014 (0.013)	-0.008 (0.010)	-0.014 (0.013)	0.004 (0.010)	-0.012 (0.012)	-0.012 (0.011)	-0.019 (0.016)
10	-0.008 (0.008)	-0.042*** (0.015)	-0.016 (0.014)	-0.012 (0.013)	-0.006 (0.010)	-0.012 (0.013)	0.002 (0.010)	-0.010 (0.012)	-0.009 (0.011)	-0.012 (0.016)
Observations	101,292	72,247	83,538	83,373	82,746	83,520	82,574	98,774	98,081	33,259

Note: Effects are obtained by estimating equation (1) by OLS with the specified dependent variables. *** indicates that the effect is statistically different from zero at the 1% level, ** at the 5% level and * at the 10% level.

Source: Authors' calculations using Family Resources Survey and Family Expenditure Survey, 1978 to 2015.

Appendix Table 4. Effect of a 1 percentage point increase in the output gap (positive is above trend) upon entering labour market on measures of employment, earnings, income and expenditure

Effect, by years since left education	For working families only						For all families			
	In paid work	Log individual earnings of workers	Log family earnings	Log family private income	Log family net income	Log household private income	Log equivalised net household income	Log equivalised net family income	Log equivalised net household income	Log equivalised total expenditure
0	0.0102*** (0.0029)	0.0166*** (0.0048)	0.0184*** (0.0049)	0.0197*** (0.0048)	0.0169*** (0.0043)	0.0089 (0.0055)	0.0048 (0.0040)	-0.0007 (0.0048)	0.0070** (0.0034)	-0.0010 (0.0042)
1	0.0082*** (0.0021)	0.0109*** (0.0031)	0.0097*** (0.0034)	0.0093*** (0.0034)	0.0061** (0.0030)	0.0016 (0.0039)	-0.0005 (0.0029)	0.0139*** (0.0031)	0.0019 (0.0028)	-0.0005 (0.0034)
2	0.0073*** (0.0020)	0.0055* (0.0029)	0.0089*** (0.0032)	0.0089*** (0.0031)	0.0066** (0.0028)	0.0018 (0.0035)	-0.0016 (0.0027)	0.0089*** (0.0029)	0.0044 (0.0027)	0.0022 (0.0036)
3	0.0009 (0.0019)	0.0067** (0.0027)	0.0100*** (0.0031)	0.0099*** (0.0030)	0.0058** (0.0027)	0.0046 (0.0034)	0.0018 (0.0027)	0.0092*** (0.0028)	0.0060** (0.0027)	0.0052 (0.0037)
4	0.0000 (0.0018)	0.0044* (0.0027)	0.0054* (0.0030)	0.0048 (0.0030)	0.0022 (0.0026)	-0.0023 (0.0032)	-0.0051** (0.0025)	0.0063** (0.0026)	-0.0005 (0.0026)	0.0040 (0.0033)
5	-0.0011 (0.0017)	0.0026 (0.0026)	0.0042 (0.0028)	0.0037 (0.0027)	0.0020 (0.0024)	0.0053* (0.0029)	0.0011 (0.0023)	0.0025 (0.0024)	0.0033 (0.0024)	0.0022 (0.0029)
6	0.0011 (0.0017)	-0.0011 (0.0026)	-0.0009 (0.0027)	-0.0009 (0.0027)	-0.0005 (0.0023)	-0.0014 (0.0028)	-0.0000 (0.0022)	0.0008 (0.0024)	0.0006 (0.0023)	-0.0027 (0.0030)
7	0.0025 (0.0017)	0.0022 (0.0027)	0.0028 (0.0027)	0.0025 (0.0027)	0.0002 (0.0023)	0.0045 (0.0028)	0.0028 (0.0022)	0.0045* (0.0024)	0.0049** (0.0023)	0.0033 (0.0029)
8	0.0038** (0.0018)	0.0001 (0.0033)	0.0044 (0.0028)	0.0048* (0.0028)	0.0038 (0.0024)	0.0007 (0.0028)	-0.0005 (0.0022)	0.0042* (0.0025)	0.0003 (0.0023)	-0.0017 (0.0029)
9	0.0052*** (0.0018)	0.0025 (0.0029)	0.0018 (0.0028)	0.0016 (0.0028)	0.0013 (0.0023)	0.0013 (0.0027)	-0.0003 (0.0022)	0.0068*** (0.0025)	0.0036 (0.0023)	0.0021 (0.0030)
10	0.0024 (0.0017)	0.0102*** (0.0029)	0.0025 (0.0028)	0.0020 (0.0028)	0.0010 (0.0023)	0.0016 (0.0028)	-0.0000 (0.0022)	0.0051** (0.0025)	0.0044* (0.0023)	0.0069** (0.0031)
Observations	197,751	145,131	157,129	156,952	156,150	156,016	154,993	187,160	192,851	70,289

Note: Effects are obtained by estimating equation (1) by OLS with the specified dependent variables. *** indicates that the effect is statistically different from zero at the 1% level, ** at the 5% level and * at the 10% level.

Source: Authors' calculations using Family Resources Survey and Family Expenditure Survey, 1978 to 2015.