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	0.028	0.011
	(0.008)	(0.008)	(0.022)	(0.023)
1	–0.009	–0.002	0.035*	0.022
	(0.008)	(0.008)	(0.019)	(0.020)
2	–0.026***	0.006	0.032*	0.010
	(0.008)	(0.008)	(0.018)	(0.020)
3	–0.042***	0.015	0.022	–0.008
	(0.008)	(0.008)	(0.018)	(0.019)
4	–0.012	0.008	0.010	–0.004
	(0.008)	(0.008)	(0.019)	(0.020)
5	–0.026***	0.003	0.027	–0.001
	(0.008)	(0.008)	(0.020)	(0.022)
6	–0.008	–0.008	0.000	–0.004
	(0.008)	(0.007)	(0.022)	(0.024)
7	–0.018**	–0.008	–0.004	0.029
	(0.008)	(0.007)	(0.024)	(0.026)
8	–0.020**	0.009	0.022	–0.016
	(0.008)	(0.007)	(0.026)	(0.028)
9	–0.015*	0.005	0.021	–0.022
	(0.008)	(0.006)	(0.028)	(0.031)
10	–0.001	–0.003	–0.023	–0.064**
	(0.008)	(0.006)	(0.029)	(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.

References

Altonji, J., Kahn, L., and Speer, J. (2016), 'Cashier or Consultant? Entry Labor Market Conditions, Field of Study, and Career Success', *Journal of Labor Economics*, 34(S1), S361–401.

Bell, B., Bindler, A., and Machin, S. (2017), 'Crime Scars: Recessions and the Making of Career Criminals', *Review of Economics and Statistics*, doi: 10.1162/REST_a_00698.

Blundell, R., Pistaferri, L., and Saporta-Eksten, I. (2016), 'Consumption Inequality and Family Labor Supply', *American Economic Review*, 106(2), 387–435.

Blundell, R., and Preston, I. (2008), 'Consumption Inequality and Partial Insurance, *American Economic Review*, 98(5), 1887–921.

Brunner, B., and Kuhn, A. (2014), 'The Impact of Labor Market Entry Conditions on Initial Job Assignment and Wages', *Journal of Population Economics*, 27(3), 705–38.

Burgess, S., Propper, C., Rees, H., and Shearer, A. (2003), 'The Class of 1981: The Effects of Early Career Unemployment on Subsequent Unemployment Experiences', *Labour Economics*, 10(3), 291–309.

Clark, A., Georgellis, Y., and Sanfey, P. (2001), 'Scarring: The Psychological Impact of Past Unemployment', *Economica*, 68(270), 221–41.

Clark, D. (2011), 'Do Recessions Keep Students in School? The Impact of Youth Unemployment on Enrolment in Post-Compulsory Education in England', *Economica*, 78(311), 523–45.

Dolls, M., Fuest, C., and Peichl, A. (2012), 'Automatic Stabilizers and Economic Crisis: US vs. Europe', *Journal of Public Economics*, 96(3), 279–94.

Genda, Y., Kondo, A., and Ohta, S. (2010), 'Long-Term Effects of a Recession at Labor Market Entry in Japan and the United States', *Journal of Human Resources*, 45(1), 157–96.

Haaland, V. (2017), 'Ability Matters: Effects of Youth Labor Market Opportunities on Long-Term Labor Market Outcomes', *Scandinavian Journal of Economics*, forthcoming, doi: 10.1111/sjoe.12248.

Harmon, C., and Walker, I. (1995), 'Estimates of the Economic Return to Schooling for the United Kingdom', *American Economic Review*, 85(5), 1278–86.

Kahn, L. (2010), 'The Long-Term Labor Market Consequences of Graduating from College in a Bad Economy', *Labour Economics*, 17(2), 303–16.

Kaplan, G. (2012), 'Moving Back Home: Insurance against Labour Market Risk', *Journal of Political Economy*, 120(3), 446–512.

Liu, K., Salvanes, K., and Sørensen, E. (2016), 'Good Skills in Bad Times: Cyclical Skill Mismatch and the Long-Term Effects of Graduating in a Recession', *European Economic Review*, 84(May), 3–17.

Machin, S., and Vignoles, A. (2006), 'Education Policy in the UK', Centre for Economics of Education, Discussion Paper 57.

McVicar, D., and Rice, P. (2001), 'Participation in Further Education in England and Wales: An Analysis of Post-War Trends', *Oxford Economic Papers*, 53(1), 47–66.

Oreopoulos, P., von Wachter, T., and Heisz, A. (2012), 'The Short- and Long-Term Career Effects of Graduating in a Recession', *American Economic Journal: Applied Economics*, 4(1), 1–29.

Pissarides, C. (1992), 'Loss of Skill during Unemployment and the Persistence of Employment Shocks', *Quarterly Journal of Economics*, 107(4), 1371–91.

Raaum, O., and Røed, K. (2006), 'Do Business Cycle Conditions at the Time of Labor Market Entry Affect Future Employment Prospects?', *Review of Economics and Statistics*, 88(2), 193–210.

Rice, P. (1987), 'The Demand for Post-Compulsory Education in the UK and the Effects of Educational Maintenance Allowances', *Economica*, 54(216), 465–75.

Schmillen, A., and Umkehrer, M. (2013), 'The Scars of Youth: Effects of Early-Career Unemployment on Future Unemployment Experience', Institut für Arbeitsmarkt- und Berufsforschung, IAB-Discussion Paper 6/2013.

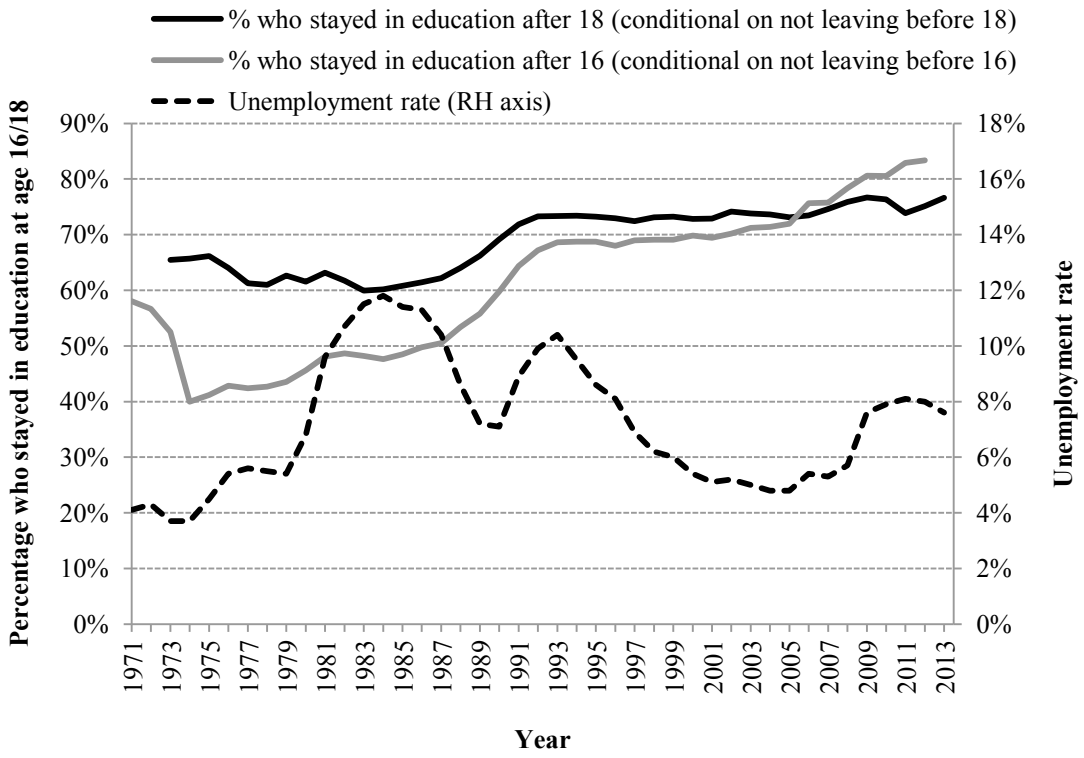
Appendix 1: Effect of unemployment rate on probability of remaining in education

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

	Low education		Mid education		High education	
Effect, by years since left 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***	–0.144***	–0.065***	–0.107***	–0.064***	–0.021
	(0.018)	(0.030)	(0.023)	(0.034)	(0.021)	(0.037)
1	–0.078***	–0.032*	–0.064***	–0.120***	–0.054***	–0.002
	(0.014)	(0.019)	(0.017)	(0.023)	(0.014)	(0.023)
2	–0.011	–0.061***	–0.041***	–0.073***	–0.042***	–0.017
	(0.014)	(0.018)	(0.015)	(0.021)	(0.012)	(0.020)
3	–0.028**	–0.058***	–0.020	–0.081***	–0.022**	–0.005
	(0.013)	(0.016)	(0.014)	(0.019)	(0.011)	(0.019)
4	–0.002	–0.024	–0.046***	–0.052***	–0.012	0.000
	(0.012)	(0.016)	(0.014)	(0.019)	(0.011)	(0.020)
5	0.006	–0.029*	–0.035***	–0.031	–0.025**	0.010
	(0.012)	(0.017)	(0.014)	(0.021)	(0.010)	(0.019)
6	–0.012	–0.006	–0.038***	–0.033*	–0.011	0.012
	(0.012)	(0.017)	(0.014)	(0.020)	(0.011)	(0.019)
7	–0.029**	–0.002	–0.038***	0.006	–0.009	–0.020
	(0.012)	(0.017)	(0.014)	(0.022)	(0.010)	(0.020)
8	–0.005	–0.003	–0.008	0.000	–0.012	0.015
	(0.012)	(0.018)	(0.014)	(0.022)	(0.011)	(0.021)
9	–0.006	0.013	–0.023*	0.012	–0.014	0.012
	(0.012)	(0.018)	(0.014)	(0.022)	(0.011)	(0.021)
10	–0.002	0.014	–0.029**	–0.035	–0.005	–0.020
	(0.012)	(0.018)	(0.014)	(0.022)	(0.010)	(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	In paid work	Log individual earnings of workers	For working families only: Log family earnings	Log family private income	Log family net income	Log household private income	Log equivalised net household income	For all families: Log equivalised net family income	Log equivalised net household income	Log equivalised total expenditure
0	–0.128***	–0.159**	–0.176**	–0.154**	–0.116**	–0.154**	–0.035	–0.124**	–0.095**	–0.124*
	(0.042)	(0.074)	(0.069)	(0.066)	(0.057)	(0.066)	(0.042)	(0.055)	(0.044)	(0.065)
1	–0.054***	–0.016	–0.022	–0.026	–0.005	–0.028	0.002	–0.030	–0.030	–0.036
	(0.020)	(0.028)	(0.033)	(0.032)	(0.027)	(0.032)	(0.023)	(0.026)	(0.024)	(0.037)
2	–0.047***	–0.049**	–0.088***	–0.092***	–0.061***	–0.086***	–0.032*	–0.083***	–0.083***	–0.049*
	(0.015)	(0.025)	(0.026)	(0.025)	(0.021)	(0.025)	(0.018)	(0.020)	(0.018)	(0.028)
3	–0.039***	–0.084***	–0.095***	–0.094***	–0.054***	–0.094***	–0.047***	–0.077***	–0.075***	–0.096***
	(0.013)	(0.020)	(0.021)	(0.021)	(0.017)	(0.021)	(0.015)	(0.018)	(0.016)	(0.024)
4	–0.018	–0.046**	–0.024	–0.021	–0.004	–0.020	–0.003	–0.026	–0.029**	–0.070***
	(0.012)	(0.018)	(0.018)	(0.018)	(0.015)	(0.018)	(0.014)	(0.016)	(0.014)	(0.021)
5	–0.014	–0.016	–0.031*	–0.029*	–0.015	–0.029*	–0.003	–0.034**	–0.026**	–0.022
	(0.010)	(0.018)	(0.016)	(0.016)	(0.013)	(0.016)	(0.012)	(0.014)	(0.013)	(0.018)
6	–0.022**	–0.022	–0.024	–0.022	–0.010	–0.024	–0.010	–0.031**	–0.037***	–0.038**
	(0.010)	(0.016)	(0.015)	(0.015)	(0.012)	(0.015)	(0.011)	(0.013)	(0.012)	(0.017)
7	–0.022**	–0.035**	–0.033**	–0.032**	–0.018	–0.032**	0.000	–0.028**	–0.028**	–0.024
	(0.009)	(0.016)	(0.014)	(0.014)	(0.011)	(0.014)	(0.010)	(0.012)	(0.011)	(0.016)
8	–0.008	–0.017	–0.024*	–0.021	–0.011	–0.021	–0.006	–0.011	–0.016	–0.008
	(0.009)	(0.016)	(0.014)	(0.014)	(0.011)	(0.014)	(0.010)	(0.012)	(0.011)	(0.016)
9	–0.011	–0.013	–0.016	–0.014	–0.008	–0.014	0.004	–0.012	–0.012	–0.019
	(0.009)	(0.015)	(0.014)	(0.013)	(0.010)	(0.013)	(0.010)	(0.012)	(0.011)	(0.016)
10	–0.008	–0.042***	–0.016	–0.012	–0.006	–0.012	0.002	–0.010	–0.009	–0.012
	(0.008)	(0.015)	(0.014)	(0.013)	(0.010)	(0.013)	(0.010)	(0.012)	(0.011)	(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	In paid work	Log individual earnings of workers	For working families only: Log family earnings	Log family private income	Log family net income	Log household private income	Log equivalised net household income	For all families: Log equivalised net family income	Log equivalised net household income	Log equivalised total expenditure
0	0.0102***	0.0166***	0.0184***	0.0197***	0.0169***	0.0089	0.0048	–0.0007	0.0070**	–0.0010
	(0.0029)	(0.0048)	(0.0049)	(0.0048)	(0.0043)	(0.0055)	(0.0040)	(0.0048)	(0.0034)	(0.0042)
1	0.0082***	0.0109***	0.0097***	0.0093***	0.0061**	0.0016	–0.0005	0.0139***	0.0019	–0.0005
	(0.0021)	(0.0031)	(0.0034)	(0.0034)	(0.0030)	(0.0039)	(0.0029)	(0.0031)	(0.0028)	(0.0034)
2	0.0073***	0.0055*	0.0089***	0.0089***	0.0066**	0.0018	–0.0016	0.0089***	0.0044	0.0022
	(0.0020)	(0.0029)	(0.0032)	(0.0031)	(0.0028)	(0.0035)	(0.0027)	(0.0029)	(0.0027)	(0.0036)
3	0.0009	0.0067**	0.0100***	0.0099***	0.0058**	0.0046	0.0018	0.0092***	0.0060**	0.0052
	(0.0019)	(0.0027)	(0.0031)	(0.0030)	(0.0027)	(0.0034)	(0.0027)	(0.0028)	(0.0027)	(0.0037)
4	0.0000	0.0044*	0.0054*	0.0048	0.0022	–0.0023	–0.0051**	0.0063**	–0.0005	0.0040
	(0.0018)	(0.0027)	(0.0030)	(0.0030)	(0.0026)	(0.0032)	(0.0025)	(0.0026)	(0.0026)	(0.0033)
5	–0.0011	0.0026	0.0042	0.0037	0.0020	0.0053*	0.0011	0.0025	0.0033	0.0022
	(0.0017)	(0.0026)	(0.0028)	(0.0027)	(0.0024)	(0.0029)	(0.0023)	(0.0024)	(0.0024)	(0.0029)
6	0.0011	–0.0011	–0.0009	–0.0009	–0.0005	–0.0014	–0.0000	0.0008	0.0006	–0.0027
	(0.0017)	(0.0026)	(0.0027)	(0.0027)	(0.0023)	(0.0028)	(0.0022)	(0.0024)	(0.0023)	(0.0030)
7	0.0025	0.0022	0.0028	0.0025	0.0002	0.0045	0.0028	0.0045*	0.0049**	0.0033
	(0.0017)	(0.0027)	(0.0027)	(0.0027)	(0.0023)	(0.0028)	(0.0022)	(0.0024)	(0.0023)	(0.0029)
8	0.0038**	0.0001	0.0044	0.0048*	0.0038	0.0007	–0.0005	0.0042*	0.0003	–0.0017
	(0.0018)	(0.0033)	(0.0028)	(0.0028)	(0.0024)	(0.0028)	(0.0022)	(0.0025)	(0.0023)	(0.0029)
9	0.0052***	0.0025	0.0018	0.0016	0.0013	0.0013	–0.0003	0.0068***	0.0036	0.0021
	(0.0018)	(0.0029)	(0.0028)	(0.0028)	(0.0023)	(0.0027)	(0.0022)	(0.0025)	(0.0023)	(0.0030)
10	0.0024	0.0102***	0.0025	0.0020	0.0010	0.0016	–0.0000	0.0051**	0.0044*	0.0069**
	(0.0017)	(0.0029)	(0.0028)	(0.0028)	(0.0023)	(0.0028)	(0.0022)	(0.0025)	(0.0023)	(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.