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Early influences on saving behaviour: Analysis of British panel data

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ABSTRACT

Using data from the British Household Panel Survey and Understanding Society, we examine the saving behaviour of individuals over time. Initially, we explore the determinants of the saving behaviour of children aged 11–15. Our findings suggest that parental allowances/pocket money (earnings from part-time work) lower (increase) the probability that a child saves. There is also evidence that the financial expectations of the head of household have an influence on their offspring's saving behaviour, where children of optimistic parents have a lower probability of saving by approximately 2 percentage points. However, there is no evidence of an intergenerational correlation in savings behaviour: the saving behaviour of parents appears to have no bearing on the saving decisions of their offspring. We then go on to explore the implications of the saving behaviour of children for their savings decisions in later life, specifically when observed in early adulthood. We find that having saved as a child has a large positive influence both on the probability of saving on a monthly basis and on the amount saved as an adult. This finding is robust to alternative empirical strategies including IV analysis where the most conservative estimates show that having saved as a child increases the probability of saving during adulthood by 12 percentage points.

1. Introduction and background

Household saving has attracted considerable interest in the economics literature with particular focus on the various motivations behind saving behaviour, which are arguably complex and interrelated. Browning and Lusardi (1996) present a comprehensive review of household saving from both an empirical and a theoretical perspective in which they discuss motivations for savings focusing on those listed by Keynes (1936). Such motivations include: precautionary saving where households hold a contingency fund in case of adverse future events; to smooth income and consumption over the life cycle; and the inter-temporal substitution motive whereby households benefit from accumulating interest on savings. Clearly, motives for saving will differ across households as well as over time for a given household. Such motives are likely to be interrelated and, indeed, complementary. For example, a household which saves to accumulate interest from savings will also hold a fund to be used should unforeseen adverse events occur. Regardless of the motivations behind saving behaviour, a commonly held view is that individuals and households are not saving enough in the context of both short-term saving as well as long-term saving for retirement (see, for example, Crossley et al., 2012). We contribute to the existing empirical literature on saving by exploring the implications of saving behaviour at the early stages of the life cycle, from childhood through to early adulthood, which has attracted very little interest in the economics literature.[1]

Although most children do not hold financial assets, it is apparent that children may face saving decisions albeit in the context of saving, for example, for a toy or for the latest mobile phone as opposed to large scale saving decisions, such as a house purchase. Evidence from the economic psychology literature suggests that children are capable of saving. For example, Otto et al. (2006) adopt an experimental approach to explore children's use of saving strategies in the context of saving for a toy when faced with income uncertainty. The results based on a sample of 42 children indicate that children aged between 9 and 12 are able to formally manage their money, with children aged 12 frequently making 'bank' deposits as a means to avoid the temptation to spend tokens on, for example, sweets. In Section 2, we contribute to this embryonic

[1] The shortage of existing research in this area may reflect issues with data availability. In particular, there is a distinct lack of large scale representative surveys which include information on children's saving behaviour. For example, in our analysis, we require information on saving behaviour as a child, parental saving behaviour when the respondent was a child and saving behaviour in early adulthood.

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literature by exploring the determinants of children's saving behaviour using data drawn from a large scale nationally representative survey. We focus on whether an intergenerational link exists between the saving behaviour of parents and their children.

One might conjecture that an intergenerational link exists between the attitudes towards finances between parents and their children as parents may seek to equip their children with particular values and life skills. The financial literacy of young adults and the role of financial education in preparing children and young adults for entry into a complex economic and financial environment is a topical issue (see Lusardi and Mitchell, 2014, for a recent review), yet there has been limited discussion of the intergenerational relationship between such skills and attitudes. Such an association may reflect an intergenerational link between both cognitive skills in terms of financial literacy as well as non cognitive skills such as attitudes towards finances and taking risk. As argued by Lusardi and Mitchell (2007), p. 213, 'savings decisions are complex, requiring consumers to possess substantial economic knowledge and information.' It may be the case, therefore, that parents who possess a certain degree of financial literacy may seek to impart such skills to their offspring in order to equip them with financial management skills for the future.

Hence, children and young adults may acquire attitudes towards finances from their parents. For example, Mandell (2008) reports that parents are the key source of financial information for students at high school. Grinstein-Weiss et al. (2011), who explore a sample of low and moderate income households, find that adults who received relatively high levels of money-management education from their parents during their childhood had lower credit card debt and higher credit scores as adults. Such findings tie in with the recent education literature (see Black and Devereux, 2011, for a comprehensive survey), which has documented the existence of strong positive intergenerational association in educational attainment, which itself has clear implications for future income and wealth generation.

A related strand of the literature on intergenerational aspects of economic and financial attitudes has focused on estimating the intergenerational elasticity of wealth between parents and their adult children. For example, Charles and Hurst (2003) estimate this age-adjusted elasticity at 0.37 prior to the transfer of bequests using data from the U.S. Panel Study of Income Dynamics (PSID). Lifetime income and asset ownership are found to be key determinants of the wealth elasticity, with shared risk preferences explaining a relatively small portion of the intergenerational wealth elasticity. Thus, the findings in the existing literature support a sizeable intergenerational correlation of wealth.

In a seminal contribution, Becker (1993) argues that children are heavily influenced by the attitudes and behaviour of their parents, with childhood experiences during the formative early years serving to shape individuals' preferences. Furthermore, as argued by Knowles and Postlewaite (2004), parents invest considerable amounts of time, effort and money in order to influence the preferences of their children. Using U.S. data, Knowles and Postlewaite (2004) find that parents' saving behaviour influences the saving behaviour of their adult offspring. They present a life-cycle model in which intergenerational savings correlations can be interpreted as intergenerational discount-factor correlations. They use data from the U.S. PSID to estimate family savings effects, which are found to be economically and statistically significant. In the context of their model, family effects can be linked to factors such as patience or self-control (see, for example, seminal contributions by Thaler and Shefrin, 1981, who present an intertemporal choice model of self-control with the individual being both a 'farsighted *planner* and a myopic *doer*' and Becker and Mulligan, 1997, who analyse the endogenous determination of time preference). With respect to skills and attitudes towards financial planning, Ameriks et al. (2003) present evidence supporting the role of differences in planning in influencing the propensity to save and saving patterns. Such findings suggest that intergenerational transmission of preferences and attitudes may lead to intergenerational correlation in financial decision-making such as saving behaviour.

More recently, Cronqvist and Siegel (2015), using data on Swedish twins aged between 20 and 65, explore the origins of saving behaviour. Their findings suggest that genetic differences explain approximately 33 percent of the variation in propensity to save across individuals. Parenting is found to influence the variation in savings rates for younger individuals, but the effect diminishes over time. Environmental factors during the individual's childhood such as parental wealth are found to moderate the genetic effects.

Having explored the determinants of saving behaviour during childhood, in Section 3 we investigate the influence of saving behaviour as a child on saving decisions in early adulthood. This may have further implications for financial behaviour and decision-making at later stages of the life cycle. It is apparent that saving decisions during childhood may influence attitudes towards finances at later stages of the life cycle and, hence, have implications for saving behaviour observed during adulthood. Indeed, our empirical findings, based on panel data which follows individuals from childhood into adulthood, suggest that having saved as a child has relatively large positive effects on both the probability of saving and the amount saved as an adult, a finding which is robust to a number of alternative empirical strategies – with the most conservative estimates at 12 and 14 percentage points respectively.

2. Saving behaviour during childhood

2.1. Data and methodology

We analyse the British Household Panel Survey (BHPS), a survey conducted by the Institute for Social and Economic Research comprising approximately 10,000 annual individual interviews from 1991 to 2008.[2] Since 1994, children aged 11–15 completed a short interview for the BHPS Youth Questionnaire. On reaching age 16, they complete the standard adult questionnaire, which allows us to follow the individuals into adulthood (see Section 3 for further details and Fig. 1 which provides an event-timeline depicting the years of observation for the empirical strategy). In the BHPS Youth Questionnaire for years 1997–2001 and 2005, the children were asked '*what do you usually do with your money?*' The possible responses were: *save to buy things*; *save and not spend*; and *spend immediately*. The responses thus provide information relating to the saving behaviour of children: 43% of children save to buy things; 35% save and not spend; and 22% spend immediately. Pooling the BHPS Youth Questionnaire for years 1997–2001 and 2005, when the information on childhood saving behaviour was elicited, we obtain an unbalanced panel of data with 6201 observations consisting of 3163 children, who are observed in the panel, on average, 3 times. We are able to match the responses to the BHPS Youth Questionnaire with that of the adult questionnaires in order to link information relating to children and their parents.

We focus on exploring the determinants of the probability that children save rather than spend their money immediately via a random effects binary probit framework as follows:

$$S_{it}^{C} = 1[\boldsymbol{X}_{1it}'\boldsymbol{\beta} + \phi \log(S_{it}^{P}) + \mathbf{EXP}_{it}^{P\prime}\boldsymbol{\gamma} + \alpha_i + \varepsilon_{it} > 0] \quad (1)$$

[2] The BHPS was replaced by Understanding Society in 2009, which is discussed below in Section 3.

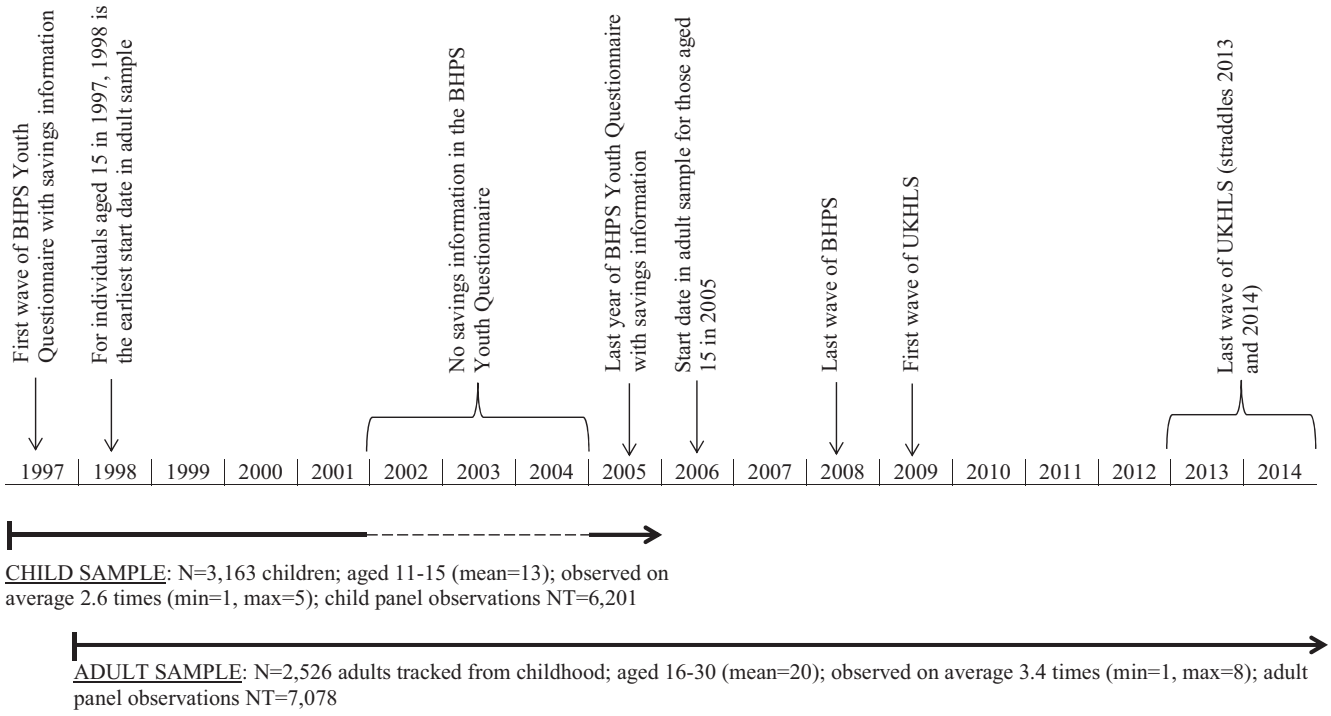

Fig. 1. Event timeline.

where there are $i = 1,\ldots N$ children, and $t = 1,\ldots T$ time periods, S_{it}^{C} is an indicator variable for whether the child saves. The individual specific unobservable effect in the error term is denoted by α_i, i.e. a random effect $\alpha_i \sim IID(0, \sigma_\alpha^2)$, and ε_{it} is a white noise error term, i.e. $\varepsilon_{it} \sim IID(0, \sigma_{it}^2)$. This specification allows for correlation between the error terms of children over time, i.e. $\rho_1 = \sigma_\alpha^2/(\sigma_\alpha^2 + \sigma_\varepsilon^2)$, which represents the proportion of the total unexplained variance in the dependent variable contributed by the panel level variance components. If the panel component of the data is important then we would expect $\rho_1 \neq 0$, where the magnitude of the parameter indicates the extent of the unobservable intra-personal correlation in children's saving behaviour over time.

The control variables in $\boldsymbol{X}_{1it}$ include the allowance received by the child in the previous week,[3] the pay received by the child from part-time work in the previous week, and additional child and household characteristics. The information on allowances is elicited from the following question: '*How much money did you receive last week to spend on yourself? Please include pocket money and any allowance you get. But if you have a job, do not include money you earned.*' Information relating to hours worked for pay and the money received from that work is derived from the following question asked to children: '*Last week, how many hours did you spend doing work for pay?*'[4] They were also asked: '*How much money did you earn last week? Do not include pocket money or allowances.*' It is apparent that the responses to these questions could potentially cover earnings from both formal and informal employment. Indeed, children in the UK are legally allowed to work from the age of 13, with certain exceptions that allow working at a younger age, such as work in television, the theatre or modelling, which requires a performance licence. Hence, reported hours of work below the age of 13 could relate to this specific type of work or could reflect informal work, possibly carried out at home.[5]

Additional characteristics of the child included in $\boldsymbol{X}_{1it}$ are as follows: gender; a quadratic in age; whether the child is the natural child of his/her parents; a binary indicator for whether the child does not have a computer at home; in terms of educational aspirations, we control for whether the individual intends to go to college or sixth form after the compulsory schooling age of 16. Additionally, we control for household/parent characteristics in $\boldsymbol{X}_{1it}$ specifically: equivalized yearly household income (based on

[3] There are a small number of studies in the economic psychology literature exploring the provision of pocket money to children. For example, Furnham (2001) explores parental attitudes towards pocket money amongst a sample of 300 British parents. Approximately three-quarters of the sample believed that children should be encouraged to save pocket money or financial gifts. Such findings support the notion that the provision of pocket money represents a kind of 'economic education' (see, Barnet-Verzat and Wolff (2002), for a concise survey of this area). Barnet-Verzat and Wolff (2002) explore the motives behind intergenerational financial transfers focusing on pocket money and discuss three main motives in the economics literature for transfers from parents to children: 'altruism, exchange and preference shaping.' Their econometric study of 5300 families in France indicates heterogeneity in parental motives to give pocket money.

[4] In the UK, there are legal restrictions imposed on child employment (for further details see http://www.direct.gov.uk/en/Parents/ParentsRights/DG_4002945). In particular, during school term time children may work a maximum of 12 h per week, whereas during school holidays, 13–14 (15–16) year olds may work a maximum of 25 (35) hours per week. The interviews for the BHPS took place in January, February, March, April, May, September, October, November and December. Since the interviews did not take place in the main school holiday period (July and August), we treat 12 h per week as the upper limit on hours worked. We, therefore, omit 2% of the sample of children who report weekly hours of work in excess of 12 h.

[5] As stated by an anonymous reviewer, it should be acknowledged that there may be differences in how households frame allowances, which we do not observe in the data. Some households may, for example, pay an allowance conditional on carrying out some household chores thereby potentially making the distinction between an allowance and payment for work less clear. It is important to bear this caveat in mind when interpreting the results.

the McClements equivalence scale before housing costs);[6] the highest level of educational attainment of the parent distinguishing between degree, further education, A level, O level (GCSE), with no education as the omitted category;[7] housing tenure to proxy household wealth, i.e. owning the home without a mortgage, owning the home with a mortgage and renting from the council (the reference category is renting from a housing association, or an employer, or privately rented); the number of adults in the household; the number of children in the household; a binary indicator for a single parent household; whether either parent talks to the child about issues which are important on a daily basis (the idea here is that this might capture the importance of verbal directives); year controls; and region controls.

To ascertain whether an intergenerational link exists in saving behaviour, we include the monthly amount saved by the child's parent, S^p_{it}, in the set of explanatory variables. This is based on responses to the following question: '*Do you save any amount of your income, for example, by putting something away now and then in a bank, building society, or Post Office account other than to meet regular bills? About how much, on average, do you manage to save a month?*' Hence, it relates to 'active' saving. As well as providing information on parental saving, the BHPS includes information on the financial expectations of adults in the household. To be specific, adult members of the household were asked: '*Looking ahead, how do you think you yourself will be financially a year from now, will you be: better than now; worse than now; or about the same*'? Hence, we also explore whether parental financial expectations influence the saving behaviour of their offspring by including these controls in the vector $\mathbf{EXP}^p_{it}$, specifically whether future finances are expected to improve (optimistic) or whether no change in finances is expected, with future finances expected to get worse (pessimistic) comprising the reference category.[8] Summary statistics of the above variables are presented in Table 1 and a correlation matrix of the covariates used in the analysis is given in Table A1 in the appendix, where clearly the degree of correlation is relatively low amongst the control variables even where statistically significant.[9]

2.2. Results

In the first column of Table 2 we present the findings from the random effects probit analysis, i.e. from estimating Eq. (1), where standard errors and marginal effects are reported.[10] Clearly, over time the unobserved individual child heterogeneity of the panel is important both in terms of magnitude and statistical significance in explaining the residual variance, as can be seen by the estimated ρ_1 parameter. The results indicate that the child's allowance is negatively associated with the probability that the child saves. The magnitude of the effect of a 1 percent increase in the child's allowance is associated with a decrease in the probability that the child saves by 2.2 percentage points. In contrast, the weekly pay that the child receives from part-time work is positively associated with the probability of saving, thus, indicating a distinct difference in the influence of these two different sources of children's income on their saving behaviour.[11]

The intergenerational coefficient on the amount of monthly savings of the parents, i.e. ϕ, is positive but statistically insignificant.[12] Hence, it would appear that the saving behaviour of parents does not influence the saving decision of their offspring, which may reflect the possibility that parents do not share information regarding such household financial matters with their children. This could be a consequence of parental savings being quite passive: for example, if there is a regular bank transfer from a current account into a savings account, then arguably this is not an observed behaviour but rather an automated financial transaction. It is more conceivable that those parents who explicitly discuss this action or, indeed, the decision to carry out this action with their children might pass on a saving mentality.[13] In contrast, spending may be regarded as overt in that it potentially manifests itself in terms of, for example, new clothes or a new car. If it is the case that saving tends to be passive whilst spending is overt, parental behaviour may serve to send signals that are contrary to the message of saving and planning that a parent would ideally like their children to learn.[14] In contrast, with respect to the parent's financial expectations, optimistic or stable financial outlooks, as compared to pessimistic financial expectations, are negatively associated with the probability that the child saves, with a magnitude of approximately 2–3 percentage points. Hence, the financial outlook of the parent does appear to matter with the results being consistent with precautionary saving motives, i.e. 'saving for a rainy day', with parental financial pessimism being positively associated with the probability that the child saves.

Turning to briefly comment on the other explanatory variables, the age of the child and/or whether the child is the natural offspring of his/her parents are both positively associated with the probability of saving. Interestingly, the age effects dominate the marginal effects in terms of magnitude. In addition, whether the child indicates that he/she intends to go to college or sixth form after completing compulsory education has a relatively large positive effect on the probability that the child saves. In contrast, not having a computer in the household and being in a single parent household are both inversely associated with the probability of the child saving, which accords with intuition in that single parent households are more likely to be financially constrained and, hence, income received by the child may be required for immediate consumption purposes. Household income effects are only statistically significant at the 10 percent level, having a positive association with the probability that the child saves. However, it

[6] It should be noted that the BHPS imputes figures for income variables where there is non-response provided that the individual has given a full interview. For full details see Volume A Section V.3 of the BHPS documentation at https://www.iser.essex.ac.uk/bhps/documentation/pdf_versions/index.html.

[7] The educational attainment of the parent may be correlated with their financial literacy.

[8] We control for the financial expectations of the parent who is specified as the head of household.

[9] All monetary variables in the subsequent analysis are deflated using 2001 prices. For all monetary covariates, in order to convert to natural logarithms, we add one to the level of the variable in question.

[10] The marginal effects reported are average partial effects, see Wooldridge (2010, p. 577). Throughout the following analysis, marginal effects are calculated assuming the random effect is equal to zero, i.e. $\alpha_i = 0$.

[11] Given that paid work from part-time employment is likely to be irregular, for example, stemming from baby sitting or occasional odd jobs, it may be the case that this induces a smoothing motive for saving. Conversely, income from an allowance is arguably more regular and predictable consequently inducing no precautionary saving. Hence, these two different streams of income may have different implications for precautionary saving behaviour during childhood.

[12] To assess whether it is the decision of the parent to save rather than the amount they save which is important in influencing their child's saving behaviour, we have replaced the monetary amount saved with a binary indicator of whether the parent saved. This also yields a positive yet statistically insignificant marginal effect.

[13] There is recent evidence that parents talking to their offspring can have a direct influence on the child's financial behaviour. For example, the findings of Brown et al. (2015) highlight the importance of verbal directives to children in the context of donations to charity.

[14] We are grateful to an anonymous reviewer for highlighting this important point. Ideally, we would control for the level of parental discussions with children about personal finances and the expressed value of saving. No such controls are available in the data and, hence, this is a limitation of the analysis which should be acknowledged. We do, however, condition on whether either parent talks to their child on a daily basis about 'important issues'. This control has a positive and statistically significant association with the probability of the child saving, increasing the propensity to save by 2.2 percentage points, a finding which is consistent with the argument that verbal directives are important.

Table 1
Summary statistics.

Child sample			Young adult sample		
	Mean	Std		Mean	Std
Child characteristics					
Currently saves[#]	78.6%	*41.0%*	Currently saves[#]	36.6%	*48.2%*
Male[#]	50.5%	*50.0%*	Log monthly savings (£ amount)	1.254 (£21.41)	*1.807*
Age	13.035	*1.423*	Age	20.183	*3.220*
Log weekly allowance (£ amount)	1.687 (£9.58)	*37.253 (£12.98)*	Male[#]	48.4%	*49.9%*
Log weekly pay (£ amount)	0.592 (£3.63)	*1.094 (£8.88)*	Permanent income	7.678	*1.612*
No computer at home[#]	28.2%	*109.5%*	Volatility of income	−0.223	*1.007*
Intends to go to college[#]	72.3%	*45.0%*	Excellent health[#]	8.5%	*27.9%*
Natural child of parent	91.7%	*44.7%*	Good health[#]	14.4%	*35.1%*
			Fair health[#]	9.3%	*29.0%*
Parent/household characteristics			Number of children	0.530	*0.907*
Number of children	1.483	*0.275*	Married or cohabiting[#]	4.8%	*21.4%*
Number of adults	1.352	*0.595*	White[#]	84.5%	*36.2%*
Single parent[#]	21.3%	*47.9%*	Black[#]	6.1%	*23.9%*
Log equivalized yearly household income (£ amount)	9.734 (£20,765.53)	*0.652 (£16,495.88)*	Asian[#]	2.0%	*14.1%*
O level (GCSE)[#]	19.6%	*39.7%*	O level (GCSE)[#]	29.0%	*29.0%*
A level[#]	9.8%	*29.8%*	A level[#]	25.8%	*43.7%*
Further education[#]	25.1%	*43.4%*	Further education[#]	6.9%	*25.3%*
Degree[#]	10.8%	*31.1%*	Degree[#]	6.4%	*24.4%*
Home owned outright[#]	8.9%	*28.5%*	Employee[#]	38.0%	*48.6%*
Home owned on mortgage[#]	59.8%	*49.0%*	Self employed[#]	1.8%	*13.4%*
Home rented[#]	20.3%	*40.3%*	Unemployed[#]	8.8%	*28.3%*
Talks to child about issues that matter on a daily basis[#]	30.8%	*46.2%*	Own home outright[#]	13.8%	*34.5%*
Log monthly savings of parents (£ amount)	2.295 (£135.20)	*2.660 (£382.55)*	Own home on a mortgage[#]	50.7%	*49.9%*
Head of household expects finances to improve[#]	28.3%	*45.1%*	Rent home from council[#]	15.3%	*35.9%*
Head of household expects no change in finances[#]	53.2%	*49.9%*	Ever saved as a child[#]	72.9%	*44.4%*
			Saved as a child to buy things[#]	40.2%	*49.0%*
			Saved as a child not to spend[#]	32.8%	*46.9%*
Number of children (N)	3163		Number of adults (N)	2526	
Observations (NT)	6201		Observations (NT)	7078	

[#] Denotes a binary variable, where the mean and standard deviation are given as a %. For monetary variables we show the natural logarithm and the £ amount.

would appear that wealth effects are more important as proxied by housing tenure, where the marginal effect associated with parents owning their home outright is more than twice the magnitude of household income. Specifically, whether the home is owned outright increases the likelihood that the child saves by approximately 5 percentage points albeit at the 10 percent level of statistical significance.

To summarise, our findings suggest that the amount of the allowance or pocket money that the child receives from their parents is inversely associated with the probability of saving. In contrast, earnings from part-time work are positively associated with the probability that the child saves. Hence, different sources of income received by children appear to influence their saving behaviour in contrasting ways. However, both the weekly allowance and the weekly pay received by the child include a large proportion of zero (or missing) values.[15] Hence, assessing the role of these zero values in the weekly pay and allowance is important for both the magnitude and direction of the effects of the two variables reported. Consequently, in the second column of Table 2 we incorporate two binary indicators for whether there are zero values in pay and/or the allowance. The effects from both these sources of income remain in terms of statistical significance and the size of the estimates, as does the effects for other covariates of interest. In the final column of Table 2, we restrict the sample to include only those children who report positive monetary values on both the weekly pay and the weekly allowance, which yields a sub-sample of 1417 observations (comprising 1056 children over the period). The role of both types of income still remains although the magnitude associated with that stemming from pay is somewhat reduced.

The results from the full sample, column 1 of Table 2, reveal that there is no evidence of intergenerational correlation in saving behaviour between parents and their offspring. Indeed, there is little role found for parental/household controls. It would appear that it is largely the child characteristics and preferences which matter rather than parental financial influences, such as their saving behaviour. For example, the importance of future intentions regarding education, i.e. intending to go to college, which increases the probability of the child saving by approximately 5.7 percentage points, can be viewed as a strong signal of future orientation. This finding may reflect child specific innate preferences (such as the rate of temporal discounting), which are associated with patience and self-control, see theoretical contributions by Thaler and Shefrin (1981) and Becker and Mulligan (1997). It should be acknowledged that parental financial expectations are also important, although the magnitude of the effect stemming from the financial attitudes of the parents is around half the size of the marginal effect associated with whether the child intends to go to college or sixth form.[16]

[15] For weekly pay, there are 4565 observations at zero, with 2671 children not earning any income from paid employment over the period. For the weekly allowance, 852 observations are at zero, where 674 children receive no allowance from their parents over the sample period. The average level of weekly pay (allowance) based on positive values is 2.25 (1.96) log units, i.e. £13.78 (£11.10).

[16] To investigate whether differences exist between the influences on the saving behaviour of boys and girls, we repeat the above analysis splitting by the gender of the child. The financial expectations of the parent are found to influence the savings behaviour of girls to a larger extent than that of boys in terms of magnitude and statistical significance. We also split by mothers and fathers enabling us to match mother-daughter, father-son, mother-son and father-daughter. Again, noticeably throughout each of the subsamples, there is no role for the savings of parents – rather it is parental expectations that appear to matter.

Table 2
Determinants of children's saving behaviour.

	Full sample				Sub sample	
			Include dummies for zeros on allowance and pay		Exclude zeros on allowance and pay	
	M.E.	S.E.	M.E.	S.E.	M.E.	S.E.
Child characteristics						
Male	0.0210	*0.0128*	0.0208	*0.0128*	0.0151	*0.0224*
Age	0.1961***	*0.0688*	0.1917***	*0.0689*	0.1973	*0.1351*
Age squared	−0.0079***	*0.0026*	−0.0077***	*0.0026*	−0.0077	*0.0051*
No computer at home	−0.0496***	*0.0132*	−0.0497***	*0.0132*	−0.0621***	*0.0241*
Intends to go to college	0.0573***	*0.0119*	0.0569***	*0.0119*	0.0305	*0.0226*
Natural child of parent	0.0471***	*0.0191*	0.0479**	*0.0191*	0.0697**	*0.0324*
Log weekly allowance	−0.0215***	*0.0051*	−0.0268***	*0.0065*	−0.0269**	*0.0127*
Log weekly pay	0.0137***	*0.0049*	0.0129***	*0.0053*	0.0097*	*0.0041*
No weekly allowance	–		−0.0271	*0.0199*	–	
No weekly pay	–		−0.0311	*0.0276*	–	
Parent/household characteristics						
Number of children	−0.0045	*0.0101*	−0.0052	*0.0100*	−0.0137	*0.0185*
Number of adults	0.0023	*0.0061*	0.0024	*0.0061*	0.0106	*0.0108*
Single parent	−0.0416**	*0.0181*	−0.0411**	*0.0181*	−0.0232	*0.0322*
Log equivalized household income	0.0185*	*0.0111*	0.0189*	*0.0111*	0.0098	*0.0207*
O level (GCSE)	0.0209	*0.0165*	0.0209	*0.0165*	0.0292	*0.0291*
A level	0.0264	*0.0212*	0.0258	*0.0212*	0.0347	*0.0378*
Further education	0.0459***	*0.0163*	0.0452***	*0.0163*	0.0557	*0.0427*
Degree	0.0438**	*0.0222*	0.0488**	*0.0223*	0.0748**	*0.0314*
Own home outright	0.0480*	*0.0277*	0.0476*	*0.0276*	0.0254	*0.0535*
Own home on a mortgage	−0.0071	*0.0201*	−0.0079	*0.0201*	−0.0098	*0.0387*
Rent home from council	−0.0237	*0.0214*	−0.0248	*0.0214*	−0.0146	*0.0405*
Talks to child about issues that matter on a daily basis	0.0216**	*0.0110*	0.0209**	*0.0108*	−0.0001	*0.0217*
Log savings of parents	0.0016	*0.0023*	0.0014	*0.0023*	0.0020	*0.0042*
Head of household expects finances to improve	−0.0238***	*0.0083*	−0.0236**	*0.0085*	0.0026	*0.0238*
Head of household expects no change in finances	−0.0290**	*0.0132*	−0.0289**	*0.0132*	−0.0225	*0.0257*
Controls	*Year and region of residence*					
Wald chi squared; *p value*	183.63 *p = 0.000*		186.29 *p = 0.000*		40.78 *p = 0.651*	
Intra correlation coefficient ρ_1; *p value*	0.578 *p = 0.000*		0.578 *p = 0.000*		0.661 *p = 0.079*	
Observations	6201				1417	

***,**,* Denotes statistical significance at the 1, 5 and 10 percent levels respectively.

3. Saving behaviour during early adulthood

3.1. Data and methodology

From the sample of children drawn from the BHPS Youth survey, 2526 individuals (80%) can be tracked into the full BHPS survey post 1997, and potentially through to 2013/14 using Understanding Society, the UK Household Longitudinal Study (UKHLS), which is the follow-up survey to the BHPS, where we observe the individuals in early adulthood.[17] These individuals are observed, on average, 3 times in the panel yielding 7078 observations. The average age is 20 with a minimum (maximum) age of 17 (30). The average length of time between observing the individual as a child and as a young adult is 7 years. The time line between observing the individual as a child and subsequently as an adult is shown in Fig. 1. By following individuals from childhood to early adulthood, we can examine the influence of saving behaviour as a child, S_{it}^{C}, on the probability that the individual saves on a monthly basis during early adulthood, S_{it}^{A}, where 37% of the sample save on a monthly basis. The specific survey question is as defined in Section 2.1 and, hence, relates to 'active' saving.

In our sample of matched information on the individual's saving behaviour as a child and in early adulthood, 31% of the sample saved both as a child and in early adulthood, whereas 15% did not save as a child and in early adulthood. Given the question related to saving, we can also model the monthly amount saved. Hence, in terms of the empirical analysis we estimate the following: (i) a static random effects probit model; (ii) a dynamic random effects probit model; (iii) a random effects tobit model; and (iv) instrumental variable models. There is the potential for endogeneity of saving as a child for later-in-life saving and, hence, we employ an instrumental variable approach to mitigate such issues. Across each of the specifications, there are $i = 1,...N$ individuals followed from childhood, over $t = 1,...T$ time periods.

3.1.1. Static random effects probit model

We initially estimate the following:

$$S_{it}^{A} = 1[\boldsymbol{X}_{2it}'\boldsymbol{\lambda}_1 + \psi_1 S_{it}^{C} + \alpha_i + \upsilon_{it} > 0] \quad (2)$$

where S_{it}^{A} is an indicator variable for whether the adult saves. Our approach reduces the potential for reverse causality since, as argued by Angrist and Pischke (2009), the saving behaviour of the child is measured *ex ante*, that is, it predates the outcome variable, i.e., saving behaviour as an adult. Individual specific unobservable effects are captured in α_i which is a random effect and the degree of intra-personal correlation in adult saving behaviour is given by $\rho_1 = \sigma_\alpha^2/(\sigma_\alpha^2 + \sigma_\upsilon^2)$. The vector $\boldsymbol{X}_{2it}$ includes controls for: age; gender; the number of children in the household; married or cohabiting; ethnicity – white, black, or asian (with mixed race or other ethnic group as the omitted category); the highest level of educational attainment (as defined in Section 2.1); labour market status, specifically employed, self-employed or unemployed (with out of the labour market as the omitted category); housing tenure

[17] In the first wave of the UKHLS, over 50,000 individuals were interviewed between 2009 and 2011, whilst, in the latest wave available (wave 4), over 47,000 individuals were interviewed between 2012 and 2014.

Table 3
Determinants of savings behaviour in early adulthood – ever saved as a child.

	Random effects (RE) PROBIT		Random effects (RE) Dynamic PROBIT		Random effects (RE) TOBIT	
	M.E.	S.E.	M.E.	S.E.	M.E.	S.E.
Saved in previous period	–	–	0.0690***	*0.0165*	–	–
Age	−0.1494***	*0.0256*	−0.1119***	*0.0373*	−0.2950***	*0.0619*
Age squared	0.0032***	*0.0006*	0.0023***	*0.0006*	0.0062***	*0.0014*
Male	−0.0041	*0.0164*	−0.2826**	*0.1333*	−0.0088	*0.0386*
Permanent income	0.0331***	*0.0006*	0.0460***	*0.0084*	0.0943***	*0.0148*
Volatility of income	−0.0151*	*0.0083*	−0.0040	*0.0061*	−0.0400*	*0.0242*
Excellent health	0.0592*	*0.0313*	0.0140	*0.0438*	0.1549	*0.1122*
Good health	0.0776	*0.0571*	0.0301	*0.0396*	0.1664	*0.1060*
Fair health	0.0494	*0.0422*	0.0263	*0.0398*	0.0867	*0.1084*
Number of children	−0.0136	*0.0092*	0.0294*	*0.0153*	−0.0326	*0.0228*
Married or cohabiting	0.0304	*0.0342*	0.0279	*0.0349*	0.0806	*0.0822*
White	0.0723**	*0.0336*	0.0279	*0.0307*	0.1649**	*0.0824*
Black	0.0752	*0.0473*	0.0545	*0.0401*	0.1581	*0.1226*
Asian	0.0925	*0.0675*	−0.0436	*0.0581*	0.2878	*0.1799*
O level (GCSE)	0.0683***	*0.0209*	−0.0269	*0.0309*	0.1492***	*0.0519*
A level	0.0714***	*0.0217*	−0.0183	*0.0286*	0.1995***	*0.0548*
Further education	0.0444	*0.0322*	0.0316	*0.0405*	0.1474*	*0.0796*
Degree	0.1289***	*0.0324*	0.0669*	*0.0369*	0.3470***	*0.0844*
Employee	0.1038***	*0.0172*	0.1275***	*0.0228*	0.3865***	*0.0432*
Self employed	0.1019**	*0.0501*	0.1730***	*0.0578*	0.5225***	*0.1353*
Unemployed	−0.2264***	*0.0303*	−0.1196***	*0.0357*	−0.5327***	*0.0689*
Own home outright	0.1295***	*0.0250*	0.0376	*0.0345*	0.3563***	*0.0650*
Own home on a mortgage	0.0803***	*0.0194*	0.0190	*0.0268*	0.2297***	*0.0480*
Rent home from council	−0.0483*	*0.0259*	0.0240	*0.0381*	−0.1422***	*0.0634*
Ever saved as a child	0.1450***	*0.0182*	0.1016***	*0.2223*	0.3675***	*0.0440*
Controls	*Year and region of residence*					
H_0: $\boldsymbol{\eta} = 0$; #*p value*	–		46.56 *p = 0.000*		–	
Intra correlation coefficient ρ_1; *p value*	0.420 *p = 0.000*		0.206 *p = 0.058*		0.362 *p = 0.000*	
Wald chi squared; *p value*	457.33 *p = 0.000*		816.01 *p = 0.000*		589.37 *p = 0.000*	
Observations	7078		4552		7078	

***,**,*Denotes statistical significance at the 1, 5 and 10 percent levels respectively. #provides a test of the significance of group means of time varying covariates in Eq. 3(b).

to proxy household wealth (as defined in Section 2.1); the individual's health status over the past 12 months, specifically excellent health, good health or fair health (with poor or very poor health as the reference category); permanent annual income; and the volatility of income.

Following Kazarosian (1997), permanent income is proxied by taking the fitted values from modelling the natural logarithm of equivalized yearly household income conditioned on gender, a quadratic in age, highest educational attainment, occupational dummy variables and interactions between the education and occupational dummy variables. The results of this specification, which is used to create permanent income, are shown in Table A2 in the appendix. Income volatility is calculated by taking the squared difference of detrended income between the individual's first and last year in the panel (as an adult) weighted by the number of years in the panel, as is common in the literature (see, for example, Browning and Lusardi,1996; Carroll and Samwick,1998, and Guariglia, 2001).

Summary statistics are provided in Table 1 and a correlation matrix of the covariates used in the adult analysis is given in Table A3 in the appendix. The degree of magnitude of the correlation coefficients, even where statistically significant, is relatively small which suggests that co-linearity is unlikely to be problematic in the empirical analysis. Our key covariate of interest is whether the individual saved as a child,S^C_{it}. Hence, we focus on the magnitude, sign and statistical significance of ψ_1.

3.1.2. Dynamic random effects probit model

The individual may be more likely to save if he/she has saved in the past, which may be particularly important in the context of regular monthly saving. Hence, in order to explore the robustness of our findings, we explore the effect of allowing for state dependence in the individual's saving behaviour by analysing dynamics over the time period. Thus, we re-estimate Eq. (2) allowing for state dependence by conditioning on S^A_{it-1}. The likelihood of saving over the period is modelled via a random effects dynamic panel estimator as follows:

$$S^A_{it} = 1[\pi S^A_{it-1} + \boldsymbol{G}'_{it}\boldsymbol{\theta} + \boldsymbol{Z}'_i\boldsymbol{\kappa} + \alpha_i + \omega_{it} > 0] \tag{3a}$$

where the covariates are as defined in Eq. (2) and $[\boldsymbol{X}_{2it}, S^C_{it}] \in \boldsymbol{G}_{it}, \boldsymbol{Z}_i$. The correlation between the individual effect α_i and S^A_{it-1} in the dynamic binary model makes S^A_{it-1} endogenous and, hence, the estimates will be inconsistent. Wooldridge (2010) suggests an approach to overcome this, where an appropriate treatment of the individual effect can be determined by specifying the following:

$$\alpha_i = \alpha_0 + \alpha_1 S^A_{i0} + \bar{\boldsymbol{G}}'_i\boldsymbol{\eta} + v_i \quad v_i \sim N(0,1) \tag{3b}$$

where S^A_{i0} is the initial state, i.e. whether the individual saves when first observed as an adult in the panel. This approach relies on the time invariant characteristics, $\boldsymbol{Z}_i$, and group means of the time varying covariates, $\bar{\boldsymbol{G}}_i$, where substitution of Eq. (3b) into (3a) produces an augmented random effects model. The analysis is based on a panel of 4552 observations covering the period 2000–2014. State dependence in terms of the statistical significance of S^A_{it-1} and the size of π, as well as the importance of heterogeneity, as indicated by $\rho_1 = \sigma^2_\alpha/(\sigma^2_\alpha + \sigma^2_\omega)$, are investigated by estimating Eqs. (3a,b).

3.1.3. Random effects tobit model

Given that the data provides information on the amount of monthly savings, we also estimate a random effects tobit model in order to ascertain whether having saved as a child influences the amount saved on a monthly basis in adulthood:

$$\log\left(S_{it}^{A}\right)^{*} = \boldsymbol{X}_{2it}'\boldsymbol{\lambda}_2 + \psi_2 S_{it}^{C} + \alpha_i + \epsilon_{it} = \boldsymbol{H}_{it}'\boldsymbol{\delta} + \epsilon_{it} \tag{4}$$

$$\log(S_{it}^{A}) = \max[0, \log\left(S_{it}^{A}\right)^{*}]$$

where S_{it}^{A*} is the unobserved untruncated latent dependent variable and S_{it}^{A} is the censored dependent variable. We report marginal effects on the expected value of $\log(S_{it}^{A})$ for uncensored observations, see Cameron and Trivedi (2005), defined as follows:

$$\frac{\partial E[\log(S_{it}^{A})\left|\log(S_{it}^{A}) > 0, \boldsymbol{H}\right]}{\partial h_k} = \delta_k\left\{1 - r\left(\frac{\boldsymbol{H}'\boldsymbol{\delta}}{\sigma}\right) - r^2\right\} \tag{5}$$

where $r = \phi(\frac{\boldsymbol{H}'\boldsymbol{\delta}}{\sigma})/\Phi(\frac{\boldsymbol{H}'\boldsymbol{\delta}}{\sigma})$, ϕ and Φ denote the density and cumulative distributions of the standard normal, respectively, h_k is the kth covariate from the vector $\boldsymbol{H}$, and σ is the standard error of the regression.

In the empirical analysis, S_{it}^{C} is defined in three ways: firstly, as a binary indicator for whether the individual ever saved as a child; and secondly, by a series of binary indicators for the number of times the individual saved during childhood – once, twice, three times or four or above (never saved is the reference category). Thirdly, whether the individual saved during childhood can be decomposed into whether the child saved to buy things or whether the child saved not to spend, with the reference category of not saving as a child. Saving to buy specific things may capture an aptitude for budgeting at an early age, whereas saving with no specific purpose may reflect precautionary saving motives. Hence, we also explore if these two different motivations for saving during childhood have distinct influences on saving behaviour as an adult.

3.1.4. Instrumental variable analysis

A potential criticism of the above empirical approaches is that whether the individual saved as a child might be an endogenous covariate. In order to address this issue, we adopt an instrumental variable approach where we jointly model the probability of saving during childhood and adult saving outcomes (specifically, the probability of saving as an adult and the amount saved as an adult). To do this, we employ a set of instruments which are strongly associated with the saving decision as a child but are arguably exogenous to their saving behaviour as an adult. Hence, we estimate the following joint model in Eqs. (6a) and (6b) as a bivariate probit for analysing the probability of saving as an adult:

$$S_i^{C} = 1[\boldsymbol{X}_{2i}'\boldsymbol{\pi}_1 + \mathbf{EXP}_i^{P\prime}\boldsymbol{\pi}_2 + v_{1i} > 0] \tag{6a}$$

$$S_i^{A} = 1[\boldsymbol{X}_{2i}'\boldsymbol{\pi}_3 + \pi_4 S_i^{C} + v_{2i} > 0] \tag{6b}$$

We also model the amount saved as an adult in a joint framework where Eqs. (6a) and (6c) are jointly estimated as follows:

$$\begin{aligned}\log\left(S_i^{A}\right)^{*} &= \boldsymbol{X}_{2i}'\boldsymbol{\pi}_5 + \pi_6 S_i^{C} + v_{3i}\\ \log(S_i^{A}) &= \max[0, \log\left(S_i^{A}\right)^{*}]\end{aligned} \tag{6c}$$

We observe the individual during childhood, on average, 3 times, between 1997 to 2001 and 2005, and then as an adult again, on average, 3 times, between 1998 and 2013/14. Although we have panel data, this relates to two distinct time periods, i.e. childhood and adulthood, as shown in Fig. 1. By definition, the time periods do not coincide and the length of the two respective panels can also differ. This subsequently means that the IV models given in Eqs. (6a), (6b), (6c) are estimated on cross-sectional data. Covariates are based on the final time the adult is observed in the panel. In terms of the key variables of interest, S_i^{A} is an indicator variable for whether the adult saved in the final period observed in the data and S_i^{C} is an indicator variable for whether the individual ever saved during their childhood. Focusing on the final time period that the individual is observed as an adult maximises the gap between saving decisions made as a child, i.e. S_i^{C}, and those made when observed in the data for the final time as an adult, i.e. S_i^{A}, where the gap is now 9 years, on average.

In terms of modelling the probability of whether the individual saved a child, i.e. Eq. (6a), we include those covariates which are used to model adult saving outcomes, i.e. $\boldsymbol{X}_{2i}$, and a set of instrumental variables. The instruments are based on the financial expectations of the individual's parent as given by vector $\mathbf{EXP}_i^{P}$. These instruments seem plausible from a theoretical point of view in that there is no obvious reason why the financial expectations of the parent, measured *ex ante*, should influence the current saving behaviour of their offspring now observed as young adults. One possible mechanism, however, may operate via intergenerational correlation in financial attitudes. To attempt to overcome this, we also estimate Eq. (6a) jointly with (6d), taking dynamics into account:

$$S_i^{A} = 1[\zeta S_{it-1}^{A} + \boldsymbol{X}_{2i}'\boldsymbol{\pi}_7 + \pi_8 S_i^{C} + v_{4i} > 0] \tag{6d}$$

If intergenerational correlation in financial expectations exists, then this should be subsumed into the dynamic effect.[18] Based on the results reported in Section 2.2, from a statistical viewpoint, parental expectations appear to be valid instruments. The argument here is that there is a direct relationship between the expectations of parents and the saving behaviour of their children, whilst there should be no direct association between parental expectations and the saving behaviour of their offspring when observed as young adults – only an indirect relationship operating through the effect on the probability of saving as a child.

The alternative IV models are all estimated simultaneously by a conditional recursive mixed process estimator (CMP), Roodman (2011).[19] The error terms v_{1i} and v_{ji} are assumed to be jointly normally distributed, i.e. $(v_{1i}, v_{ji})' \sim N(0, \Sigma)$, and the correlation between the equations is given by $\rho_2 = \sigma_{v1}^2/(\sigma_{v1}^2 + \sigma_{vj}^2)$, where j equals 2, 3 or 4.

3.2. Results

3.2.1. Static random effects probit model

The first column of Table 3 summarises the results of estimating Eq. (2). Clearly, the panel nature of the data is important given the statistical significance of the ρ_1 parameter, indicating that there is

[18] Based on the sample of 2526 young adults, the evidence for the existence of an intergenerational correlation in financial expectations is weak, given that the correlation between the financial expectations of the individual's parent and those of the young adult is small in magnitude and statistically insignificant at 0.0237 (p-value = 0.2331). Table A4 in the appendix provides a cross tabulation of financial expectations. The low correlation is not surprising given the small proportions observed on the lead diagonal: i.e. young adults, on average, have different financial expectations to that of their parent, where the latter was observed during the individuals' childhood.

[19] The CMP is an appropriate estimator in this context since the availability of instruments allows the construction of a recursive set of equations, similar to a two-stage least squares (2SLS) regression. In the estimation of Eqs. (6a), (6b), (6a), (6c), (6a) and (6d), CMP is a Limited Information Maximum Likelihood (LIML) estimator, where the first stage parameters are structural and the second stage parameters are reduced form, see Roodman (2011). Throughout, we report average marginal effects. The latest version of the 'cmp' routine in STATA, which is downloadable as an 'ado' file, allows the calculation of conditional average marginal effects. That is, marginal effects conditional on covariates in the equation of interest and on the user defined values of the other dependent variable in the joint model (if unspecified, the value is based at the mean).

Table 4
Determinants of savings behaviour in early adulthood – decomposition.

	Random effects (RE) PROBIT		Random effects (RE) Dynamic PROBIT		Random effects (RE) TOBIT	
	M.E.	S.E.	M.E.	S.E.	M.E.	S.E.
Panel A: Decomposition of ever saving as a child						
Saved as a child to buy things	0.1530***	*0.0198*	0.1150***	*0.0214*	0.4183***	*0.0510*
Saved as a child not to spend	0.1358***	*0.0203*	0.0857***	*0.0220*	0.3684***	*0.0527*
H_0: $\boldsymbol{\eta} = 0$; #*p value*	–		46.59 *p = 0.000*		–	
Intra correlation coefficient ρ_1; *p value*	0.419 *p = 0.000*		0.262 *p = 0.000*		0.361 *p = 0.000*	
Wald chi squared; *p value*	458.54 *p = 0.000*		635.81 *p = 0.000*		590.95 *p = 0.000*	
Panel B: Number of times saved						
Saved as a child 1 time	0.0454***	*0.0135*	0.0042***	*0.0022*	0.1338***	*0.0522*
Saved as a child 2 times	0.0887***	*0.0285*	0.0347***	*0.0166*	0.2750***	*0.0741*
Saved as child 3 times	0.0895***	*0.0257*	0.0291***	*0.0135*	0.2503***	*0.0663*
Saved as child 4 or more times	0.1455***	*0.0259*	0.0531***	*0.0251*	0.3850***	*0.0666*
H_0: $\boldsymbol{\eta} = 0$; #*p value*	–		41.88 *p = 0.003*		–	
Intra correlation coefficient ρ_1; *p value*	0.434 *p = 0.000*		0.285 *p = 0.000*		0.376 *p = 0.000*	
Wald chi squared; *p value*	426.96 *p = 0.000*		608.56 *p = 0.000*		558.89 *p = 0.000*	
Panel C: Decomposition of number of times saved						
Saved to buy 1 time	0.1039***	*0.0259*	0.0927***	*0.0264*	0.2934***	*0.0687*
Saved to buy 2 times	0.1667***	*0.0287*	0.1314***	*0.0292*	0.5032***	*0.0786*
Saved to buy 3 times	0.1690***	*0.0268*	0.1174***	*0.0254*	0.4697***	*0.0730*
Saved to buy 4 or more times	0.1741***	*0.0308*	0.1229***	*0.0283*	0.5221***	*0.0847*
Saved to not spend 1 time	0.0434*	*0.0252*	0.0257	*0.0268*	0.1074***	*0.0402*
Saved to not spend 2 times	0.0555*	*0.0304*	0.0951***	*0.0328*	0.1831**	*0.0803*
Saved to not spend 3 times	0.0722***	*0.0284*	0.0984***	*0.0492*	0.1931**	*0.0742*
Saved to not spend 4 or more times	0.1759***	*0.0384*	0.3023***	*0.0987*	0.5047***	*0.1064*
H_0: $\boldsymbol{\eta} = 0$; #*p value*	–		42.91 *p = 0.002*		–	
Intra correlation coefficient ρ_1; *p value*	0.419 *p = 0.000*		0.253 *p = 0.000*		0.363 *p = 0.000*	
Wald chi squared; *p value*	469.11 *p = 0.000*		650.15 *p = 0.000*		608.21 *p = 0.000*	
Observations	7078		4552		7078	

***,**,*Denotes statistical significance at the 1, 5 and 10 percent levels respectively. Controls in each panel are as in Table 3. #provides a test of the significance of group means of the time varying covariates in Eq. 3(b).

Table 5
Determinants of the amount saved in early adulthood – Heckman model.

	M.E./COEF	S.E.
Amount saved		
Age	−0.3878***	*0.0964*
Age squared	0.0083***	*0.0021*
Male	0.0629	*0.0491*
Permanent income	0.0906***	*0.0214*
Volatility of income	−0.0008	*0.0267*
Excellent health	0.2618	*0.1678*
Good health	0.0615	*0.1618*
Fair health	−0.0294	*0.1728*
Number of children	−0.0052	*0.0325*
Married or cohabiting	−0.0419	*0.1232*
White	−0.2124*	*0.1129*
Black	−0.3686**	*0.1492*
Asian	0.2054	*0.1994*
O level (GCSE)	−0.0546	*0.0780*
A level	0.1154	*0.0796*
Further education	0.1069	*0.1162*
Degree	0.1517	*0.1149*
Employee	0.7145***	*0.0624*
Self employed	1.0858***	*0.1691*
Unemployed	0.0020	*0.2001*
Own home outright	0.1502***	*0.0478*
Own home on a mortgage	0.2205*	*0.1260*
Rent home from council	−0.1725*	*0.0985*
Ever saved as a child	0.1358***	*0.0433*
Probability of saving		
Number of problems reported	−0.0482**	*0.0178*
Controls	*Year and region of residence*	
Wald chi squared; *p value*	607.37 *p = 0.000*	
Intra correlation coefficient ρ_1; *p value*	0.284 *p = 0.000*	
Cross equation correlation ρ_2; *p value*	−0.114 *p = 0.000*	
Observations	7078	

***,**,*Denotes statistical significance at the 1, 5 and 10 percent levels respectively. Coefficients (marginal effects) are reported when modelling the amount saved (probability of saving).

Table 6
Modelling saving as a proportion of real equivalized household income – Ever saved as a child.

	M.E.	S.E.
Age	−0.0234***	*0.0066*
Age squared	0.0005***	*0.0001*
Male	0.0019	*0.0043*
Permanent income	0.0089***	*0.0015*
Volatility of income	−0.0059***	*0.0022*
Excellent health	0.0239**	*0.0117*
Good health	0.0229**	*0.0111*
Fair health	0.0118	*0.0115*
Number of children	−0.0013	*0.0024*
Married or cohabiting	0.0047	*0.0087*
White	0.0137	*0.0089*
Black	0.0130	*0.0123*
Asian	0.0381**	*0.0172*
O level (GCSE)	0.0133**	*0.0055*
A level	0.0172***	*0.0057*
Further education	0.0118	*0.0082*
Degree	0.0367***	*0.0083*
Employee	0.0490***	*0.0045*
Self employed	0.0586***	*0.0127*
Unemployed	−0.0542***	*0.0083*
Own home outright	0.0357***	*0.0064*
Own home on a mortgage	0.0211***	*0.0051*
Rent home from council	−0.0115*	*0.0069*
Ever saved as a child	0.0374***	*0.0048*
Controls	*Year and region of residence*	
Intra correlation coefficient ρ_1; *p value*	0.324 *p = 0.000*	
Wald chi squared; *p value*	609.44 *p = 0.000*	
Observations	7078	

***,**,*Denotes statistical significance at the 1, 5 and 10 percent levels respectively.

Table 7
Modelling saving as a proportion of real equivalized household income – Decomposition.

	M.E.	S.E.
Panel A: Decomposition of ever saving as a child		
Saved as a child to buy things	0.0397***	*0.0052*
Saved as a child not to spend	0.0347***	*0.0053*
Intra correlation coefficient ρ_1; *p value*	0.324 *p = 0.000*	
Wald chi squared; *p value*	610.72 *p = 0.000*	
Panel B: Number of times saved		
Saved as a child 1 time	0.0100	*0.0087*
Saved as a child 2 times	0.0213***	*0.0073*
Saved as child 3 times	0.0259***	*0.0066*
Saved as child 4 or more times	0.0333***	*0.0066*
Intra correlation coefficient ρ_1; *p value*	0.335 *p = 0.000*	
Wald chi squared; *p value*	581.97 *p = 0.000*	
Panel C: Decomposition of number of times saved		
Saved to buy 1 time	0.0296***	*0.0067*
Saved to buy 2 times	0.0468***	*0.0074*
Saved to buy 3 times	0.0372***	*0.0069*
Saved to buy 4 or more times	0.0454***	*0.0079*
Saved to not spend 1 time	0.0162**	*0.0080*
Saved to not spend 2 times	0.0178**	*0.0074*
Saved to not spend 3 times	0.0331***	*0.0098*
Saved to not spend 4 or more times	0.0448***	*0.0145*
Intra correlation coefficient ρ_1; *p value*	0.323 *p = 0.000*	
Wald chi squared; *p value*	625.36 *p = 0.000*	
Observations	7078	

***,** Denotes statistical significance at the 1 and 5 percent levels respectively. Controls in each panel are as in Table 6.

positive intra-personal correlation in the unobservables over time. Permanent income is positively associated with the probability of saving on a monthly basis, where a 1 percent increase in permanent income is associated with approximately a 3.3 percent increase in the likelihood of saving, ceteris paribus. Conversely, income volatility is inversely associated with the likelihood of saving. These findings are consistent with existing evidence in the literature, see, for example, Guariglia (2001). The probability that the individual saves on a monthly basis is increasing in educational attainment, where an individual with a degree is approximately 13 percentage points more likely to save than an individual with no education. Both the employed and the self-employed are more likely to save on a monthly basis than those not in the labour market. In contrast, those currently unemployed but seeking work are around 23 percentage points less likely to save. Housing tenure is also important where the results show that individuals who own their home outright or via a mortgage have a higher probability of saving on a monthly basis, which potentially reflects a wealth effect. Whether the individual ever saved during childhood has a large positive association with the probability of saving on a monthly basis in adulthood at 14.5 percentage points and is only outweighed by the effect of unemployment.

In Panel A of Table 4, we decompose the binary indicator of whether the individual ever saved as a child according to saving motive. Interestingly, whilst saving to buy things and saving not to spend, relative to not having saved during childhood, are both positively associated with the probability of saving as an adult, the dominant effect is from saving to buy things, i.e. 15.3 percentage points compared to 13.6 percentage points. It may be the case that individuals who saved as a child specifically to buy things may have acquired important skills in budgeting and setting goals at an early age, which serve to have a particularly large effect on saving behaviour in early adulthood.

In Panel B of Table 4 we define childhood saving, S^C_{it}, as a series of binary variables indicating the number of times that the individual saved during childhood. Clearly, the number of times the individual saved as a child has an increasing monotonic effect on the probability of saving during adulthood, ranging from 4.5 percentage points (saved once as a child) through to 14.6 percentage points (saved four or more times as a child). Such effects are also evident when we decompose the reasons for why the individual saved as a child, see Panel C, where generally saving to buy things dominates. The exception to this is if the child saved four or more times regardless of the motive, where the effect on the probability of currently saving is around 17 percentage points.

3.2.2. Dynamic random effects probit model

To investigate the robustness of the results, we now allow for state dependence, where the results from estimating Eq. (3) are presented in the second column of Table 3. As with the previous

Table 8
Determinants of savings behaviour in early adulthood – IV analysis.

	PROBIT		Dynamic PROBIT		TOBIT	
	M.E.	S.E.	M.E.	S.E.	M.E.	S.E.
First stage summary						
Head of household expects finances to improve	−0.0458**	*0.0227*	−0.0436**	*0.0220*	−0.0474*	*0.0254*
Head of household expects no change in finances	−0.0269***	*0.0109*	−0.0291***	*0.0111*	−0.0188***	*0.0067*
Second stage summary						
Saved in previous period	–	–	0.2337***	*0.0274*	–	–
Ever saved as a child	0.1529***	*0.0268*	0.1152***	*0.0151*	0.2375**	*0.1046*
Controls			As in Table 3			
H_0:$\boldsymbol{\pi}_1 = 0$; [1]*p value*	546.79 *p = 0.000*		463.82 *p* = 0.000		209.13 *p = 0.000*	
H_0:$\boldsymbol{\pi}_2 = 0$; [2]*p value*	17.79 *p* = 0.000		18.06 *p = 0.000*		18.44 *p = 0.000*	
H_0:$\boldsymbol{\pi}_3 = 0$; [3]*p value*	582.91 *p = 0.000*		–		–	
H_0:$\boldsymbol{\pi}_5 = 0$; [4]*p value*	–		–		169.18 *p = 0.000*	
H_0:$\boldsymbol{\eta}, \boldsymbol{\pi}_1 = 0$; [5]*p value*	–		318.28 *p = 0.000*		–	
Cross equation correlation ρ_2; *p value*	−0.767 *p = 0.000*		−0.828 *p = 0.000*		−0.182 *p = 0.000*	
Sargan-Hausman test	2.36 *p = 0.3073*		1.81 *p* = 0.4055		0.01 *p = 0.9950*	
Wald chi squared; *p value*	554.64 *p = 0.000*		840.47 *p = 0.000*		662.95 *p = 0.000*	
Observations	2526		2526		2526	

***,**,* Denotes statistical significance at the 1, 5 and 10 percent levels, respectively. [1]provides a joint test of the significance of covariates (excluding the instruments) in the first stage, Eq. (6a); [2]provides a joint test of the significance of the instruments, i.e. expectations, used in the first stage, Eq. (6a); [3]provides a joint test of the significance of covariates (excluding whether the individual saved during childhood) used in the second stage when modelling the probability that the adult saves, Eq. (6b); [4]provides a joint test of the significance of covariates (excluding whether the individual saved during childhood) used in the second stage when modelling the amount that the adult saves, Eq. (6c); and [5]provides a joint test of the significance of covariates (excluding whether the individual saved during childhood) including group means of the time varying covariates used in the second stage when modelling the probability that the adult saves allowing for dynamics, Eq. (6d).

results, there is evidence of unobserved heterogeneity in explaining unsystematic variation in the errors. State dependence is clearly important since the coefficient associated with the lagged dependent variable is statistically significant and large in terms of magnitude. Specifically, whether the individual saved in the previous period is associated with around a 7 percentage point higher probability of currently saving. Whilst some covariates have now been driven to statistical insignificance, the influence of whether the individual ever saved as a child remains in terms of both statistical significance and magnitude. Indeed, the influence of whether the individual saved as a child is of similar magnitude to that reported in the previous results where the lagged dependent variable was not included. The second column of Table 4 Panel A decomposes whether the individual saved as a child into the reasons for saving. As found above, the dominant effect stems from saving to buy things, which increases the likelihood of saving as an adult by around 12 percentage points. Focusing on the number of times the individual saved as a child, the effects are similar to those found previously in that the probability of currently saving increases monotonically with the number of times saved as a child, see Panels B and C.

3.2.3. Random effects tobit model

The final column of Table 3 presents the results from estimating Eq. (4) with marginal effects reported based on Eq. (5). Given that the dependent variable is logged and whether the individual saved as a child is a binary variable, the marginal effect can be interpreted as $\psi_2 \times 100\%$. Hence, whether the individual ever saved as a child is associated with a 36 percentage point higher level of monthly savings, conditional on the individual saving in adulthood. This estimate is clearly large and only outweighed by the effects of labour market status. In order to investigate the magnitude stemming from childhood saving, we employ an alternative estimator as a robustness check.

It is plausible that the large effect discussed above could be driven by the inclusion in the estimation of Eq. (4) of those adults with zero savings.[20] Hence, in order to investigate this further, we employ a Heckman model where the probability of saving as a young adult is jointly modelled alongside the amount saved (for savers). This requires the availability of an instrumental variable which influences the decision to save but has no effect on the amount saved. The instrument we employ is based on the number of financial problems reported in the household. Both the BHPS and UKHLS contain a range of detailed questions relating to household finances of which a subset are consistent between the two surveys. Firstly, information is available relating to whether households have difficulty paying for accommodation. Secondly, information on financial hardship at the household level can be discerned from the responses of the head of household regarding the ability of the household to afford to: keep their home adequately warm; be able to pay for a week's annual holiday; replace worn-out furniture; and be able to buy new, rather than second-hand, clothes or buy things for themselves. We create a count of the number of problems reported, CNP_{it}, and use this to explain the probability the adult saves. The Heckman model takes the following form:

$$S_{it}^{A} = 1[\varphi CNP_{it} + \alpha_i + \tau_{1it} > 0] \tag{7a}$$

$$\log(S_{it}^{A}) = \boldsymbol{X}'_{2it}\boldsymbol{\theta}_1 + \theta_2 S_{it}^{C} + \alpha_i + \tau_{2it} \tag{7b}$$

where Eq. (7a) represents the selection equation, i.e. whether the individual saves, and Eq. (7b) represents the amount saved which is a continuous variable. The model incorporates random effects, and, hence, allows for both intra-personal correlation in saving behaviour over time, ρ_1, and cross equation correlation, defined as ρ_2.[21]

The results of the analysis are shown in Table 5, where our key parameters of interest are φ and θ_2. Clearly, there is evidence of intra-correlation in the observables over time, since $\rho_1 \neq 0$, and correlation between the probability of saving and the amount saved since $\rho_2 \neq 0$. A one standard deviation increase in the number of problems reported by the individual decreases the likelihood of saving by just under 5 percentage points (given a standard deviation in the number of problems of 0.96).[22] In terms of the amount saved per month, there is still a positive and statistically significant association with having saved as a child. However, not surprisingly, as compared to the tobit analysis, the magnitude of the effect is somewhat smaller, where having saved during childhood is associated with around saving approximately 14 percentage points more per month as an adult. Hence, in the remaining tobit analysis which follows, the magnitude stemming from having saved as a child should be considered with this in mind.

Returning to the tobit estimates, when decomposing the reason for why the individual saved as a child, as found above, the dominant effect stems from saving to buy things, see Table 4 Panel A. In the alternative specifications, where we control for the number of times the individual saved during childhood, it is apparent that an individual who saved four or more times as a child would have nearly one and a half times the level of monthly savings as an individual who did not save as a child, see Panel B. As found when focusing on the probability of saving, the level of savings is increasing monotonically in the number of times saved as a child and this is also apparent once we decompose savings during childhood into the two motives, see Panel C.[23]

As an alternative to modelling the amount that the adult saves, i.e. the log level, we also analyse monthly savings as a proportion of equivalized monthly household income. This is estimated as a random effects tobit model with the results shown in Table 6, where it can be seen that whether the individual saved during their childhood is associated with 3.7 percentage points higher savings as a proportion of income as an adult. The results are consistent with those found for the level of savings in that saving during childhood to buy things has the dominant influence on savings as a proportion of household income as an adult, see Table 7 Panels A and C, and the proportion saved is increasing monotonically in the number of times the individual saved as a child, see Panels B and C.

3.2.4. Instrumental variable analysis

To assess the robustness of the findings and, in addition, to explore whether saving during childhood can be treated as an exogenous variable, Table 8 provides a summary of the findings from the instrumental variable analysis, where we endogenise saving as a child by jointly estimating: a bivariate probit model, Eqs. (6a) and (6b); a static probit model and a dynamic probit model, Eqs. (6a) and (6d); and a probit and tobit model, Eqs. (6a) and (6c). The first part of Table 8 reports the first stage results: specifically, the marginal effects associated with the financial expectations of the parent, $\boldsymbol{\pi}_2$. The analysis from the first stage is consistent with that reported in Table 2, which examined the determinants of the child's saving behaviour. In particular, compared to having a parent who was financially pessimistic (as

[20] We are very grateful to an anonymous reviewer for highlighting this point.

[21] We use the 'cmp' routine in STATA to estimate the Heckman model.

[22] If we include the number of problems reported in the amount saved per month it is statistically insignificant, thereby supporting its use as an instrument.

[23] If we adopt a Heckman selection model, based on the models in Table 4A-4C, where we focus on the reason for saving and the number of times the individual saved as a child, then, in accordance with the analysis reported in Table 5, the magnitudes of the coefficients on these variables are reduced.

reported during the individual's childhood), it can be seen that both financial optimism and expecting no change in future finances is inversely related to whether the individual saved as a child. Specifically, a young adult whose parent was financially optimistic was around 4.6 percentage points less likely to save as a child, which is consistent with precautionary saving motives. In the first stage, the instruments are jointly significant in determining whether the individual saved as a child at the 1 percent level, with test statistics in excess of the minimum threshold suggested by Stock et al. (2002). Using a Sargan-Hausman test of over-identification, the instruments are found to be jointly statistically insignificant, which satisfies the assumption that the instrumental variables are uncorrelated with the error term.

Turning to the second stage of the empirical analysis, the association between having saved as a child and whether the individual saves as an adult remains. Specifically, if the individual saved during childhood then the probability of saving as an adult is approximately 15 percentage points higher. This falls to around 12 percentage points once we condition on whether the adult saved in the previous period. In terms of the monetary amount saved, having saved during childhood is associated with a 24 percentage point higher level of monthly savings. Hence, these results are consistent with those based on a panel estimator where saving as a child is treated as an exogenous variable. Indeed, the magnitudes of the association are similar across Tables 4 and 8.

4. Conclusion

This paper contributes to the growing empirical literature exploring household finances and contributes to our understanding of a relatively neglected area relating to saving behaviour at an early stage of the lifecycle, specifically that of children and young adults. Our findings highlight the determinants of the saving behaviour of children and, in particular, indicate the importance of future orientation, as proxied by their intention to go to college, as an influence on children's saving behaviour. Such influences are found to be more important than the actual saving behaviour of parents. We do find, however, that the financial expectations of the parent influence the saving behaviour of their offspring where having an optimistic parent reduces the likelihood that the child saves by approximately 2 percentage points. In addition, our findings suggest that whether an individual saved as a child is positively associated with the probability of saving, as well as the amount saved on a regular basis, during early adulthood. This finding is robust to a range of modelling approaches including instrumental variable analysis, where the most moderate estimates imply that having saved during childhood increases the probability of saving as an adult by 12 percentage points. Hence, shaping the financial behaviour of children may have long lasting effects in terms of their financial behaviour and decision-making as an adult.

From a policy perspective, our findings suggest that how children acquire money has an important influence on their saving behaviour. Specifically, income associated with work is positively related to the likelihood that the child saves, whilst income received in the form of an allowance from parents has the opposite effect, and the elasticity associated with the latter effect dominates in terms of magnitude reducing the likelihood that the child saves by around 2 percentage points. Such findings suggest that if parents wish to encourage their children to save, they may want to consider the form in which they give allowances to children. Although it should be acknowledged that we do not observe whether parents place conditions on allowances related to, for example, helping with chores, our findings suggest that this may be a way of encouraging saving behaviour. There are, however, important implications to bear in mind: for example, more time

Table A1
Correlation matrix of covariates in child sample.

	x1	x2	x3	x4	x5	x6	x7	x8	x9	x10	x11	x12	x13	x14	x15	x16	x17	x18	x19	x20	x21	x22
x1	1																					
x2	0.002	1																				
x3	−0.057*	0.234*	1																			
x4	0.060*	0.282*	0.091*	1																		
x5	−0.023	−0.025*	−0.008	−0.025*	1																	
x6	−0.065*	−0.015	−0.045*	−0.011	−0.018	1																
x7	−0.104*	0.049*	0.013	0.006	0.013	−0.124*	1															
x8	−0.022	0.021	−0.056*	0.023	0.006	−0.008	−0.019	1														
x9	−0.007	0.023	0.036*	−0.029*	0.129*	0.129*	−0.047*	−0.068*	1													
x10	−0.009	−0.036*	−0.095*	0.023	−0.039*	0.052*	−0.032*	0.442*	−0.394*	1												
x11	0.012	0.037*	0.007	−0.011	0.007	−0.071*	0.036*	−0.022	0.002*	−0.039*	1											
x12	0.017	0.006	−0.002	0.017	0.027	−0.189*	0.119*	−0.018	−0.258*	0.009	−0.381*	1										
x13	−0.013	−0.011	0.011	0.016	−0.033*	0.241*	−0.148*	0.048*	0.197*	0.067*	−0.158*	−0.616*	1									
x14	0.026*	0.029*	0.088*	0.005	−0.056*	−0.279*	0.149*	−0.124*	−0.316*	−0.162*	−0.025	0.383*	−0.339*	1								
x15	0.039*	0.003	−0.019	−0.029*	−0.005	−0.118*	0.109*	−0.013	−0.067*	−0.019	0.054*	0.133*	−0.155*	0.244*	1							
x16	−0.027*	0.004	−0.024	0.011	0.048*	−0.019	0.039*	0.002	0.048*	−0.034*	0.011	0.059*	−0.069*	0.055*	−0.071*	1						
x17	0.025*	−0.008	−0.008	0.007	−0.007	−0.043*	−0.011	0.001	−0.019*	−0.023	−0.004	0.066*	−0.085*	0.001	−0.115*	−0.068*	1					
x18	0.007	−0.036*	−0.002	0.003	0.005	0.038*	−0.025*	−0.051*	0.037*	−0.059*	−0.027*	−0.058*	0.083*	−0.072*	−0.172*	−0.101*	−0.163*	1				
x19	−0.109*	−0.114*	0.003	−0.016	0.033*	−0.017	0.045*	0.003	−0.028*	0.006	0.008*	−0.003	−0.031*	0.008	−0.005	0.031*	−0.003	−0.007	1			
x20	0.029*	0.006	−0.003	0.025*	−0.012	−0.166*	0.114*	−0.035*	−0.240*	−0.053*	0.046*	0.259*	−0.251*	0.393*	0.176*	0.036*	0.020	−0.050*	0.010	1		
x21	0.001	−0.028*	−0.004	0.003	−0.098*	0.011	0.040*	−0.008	−0.107*	0.008	−0.055*	0.024	0.009	0.065*	0.048*	−0.014	0.007	0.010	−0.003	0.044*	1	
x22	0.011	−0.006	−0.015	−0.004	0.002*	−0.029*	−0.019	0.014	−0.132*	0.052*	0.035*	0.034*	−0.039*	0.058*	−0.012	0.008	0.018	−0.011	0.004	0.083*	−0.505*	1

*Denotes statistical significance at the 5 percent level. Labels for child variables: x1 = male child; x2 = age of child; x3 = log weekly allowance; x4 = log pay; x5 = natural child of parent; x6 = no computer at home; x7 = intends to go to college, Label for parent variables: x8 = number of children; x9 = single parent; x10 = number of adults; x11 = home owned outright; x12 = home owned on a mortgage; x13 = home rented; x14 = log equivalized household income; x15 = degree; x16 = further education; x17 = A level; x18 = O level (GCSE); x19 = talks to child about issues that matter on a daily basis; x20 = log savings of parents; x21 = head of household expects finances to improve; and x22 = head of household expects no change in finances.

Table A2
Modelling log equivalized household income.

	M.E.	*S.E.*
Age	0.1238***	*0.0151*
Age squared	−0.0010***	*0.0002*
Male	0.0948***	*0.0001*
O level (GCSE)	0.1247***	*0.0464*
A level	0.1895***	*0.0408*
Further education	0.0522	*0.0494*
Degree	0.5762***	*0.0374*
Managers and senior official occupations	0.1116**	*0.0533*
Professional occupations	0.1165***	*0.0405*
Associate professional and technical occupations	0.0643	*0.0534*
Administrative and secretarial occupations	0.0486	*0.0526*
Skilled trades occupations	−0.1218	*0.1306*
Personal service occupations	−0.0043	*0.0737*
Sales and customer service occupations	0.1982***	*0.0714*
Process, plant and machine operatives	−0.9612*	*0.5827*
Elementary occupations	−0.1535***	*0.1231*
Controls	*Occupation and education interactions* (9×5)	
H_0: interaction terms jointly = 0; *p value*	1218.09 *p = 0.000*	
Intra correlation coefficient ρ_1; *p value*	0.723 *p = 0.000*	
Wald chi squared; *p value*	890.50 *p = 0.000*	
Mean permanent income $\hat{y} = \mathbf{X}'\hat{\boldsymbol{\beta}}$ (£ amount= $\exp^{\hat{y}}$)	7.678 (£1,791.65)	
Observations	7078	

***,**,* Denotes statistical significance at the 1, 5 and 10 percent levels respectively.

spent on chores or working may mean less time for school work and studying.

In addition to allowing children to manage the money that they 'earn', parents may be able to develop the financial literacy skills of their offspring by talking to their children about finances and savings. Although we are unable to control for such specific verbal directives with our data, the effect of regular conservations between the parent and the child on 'important matters' is found to be positively associated with children's saving behaviour, highlighting the importance of such interaction.

Although our paper focuses on saving behaviour, an interesting avenue for future research relates to the implications of children's saving behaviour for their financial behaviour more generally during adulthood such as debt accumulation or the nature of financial asset holdings, such as savings accounts and the holding of stocks and shares. With increasing levels of debt and relatively low levels of saving observed at the household level, it is apparent that exploring the implications of the saving behaviour of children and how this behaviour might be influenced may ultimately help to reduce the prevailing levels of financial vulnerability and stress experienced by some households.

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Table A3
Correlation matrix of covariates in adult sample.

	x1	x2	x3	x4	x5	x6	x7	x8	x9	x10	x11	x12	x13	x14	x15	x16	x17	x18	x19	x20	x21	x22	x23
x1	1																						
x2	−0.022*	1																					
x3	−0.189	−0.068*	1																				
x4	0.326*	−0.075*	0.052*	1																			
x5	0.063*	−0.002	−0.093*	0.027*	1																		
x6	−0.008	−0.004	0.032*	−0.003	−0.597*	1																	
x7	0.005	0.022	0.149*	0.005	−0.336*	−0.037*	1																
x8	0.042*	−0.006	−0.117*	−0.069*	0.041*	−0.009	0.005	1															
x9	−0.317*	−0.012	0.132*	−0.096*	0.049*	0.003	0.005	−0.377*	1														
x10	0.035*	−0.008	−0.004	−0.038*	0.034*	0.003	0.009	−0.159*	−0.174*	1													
x11	0.326*	−0.017	−0.117*	0.036*	0.041*	−0.013	0.008	−0.154*	−0.167*	−0.071*	1												
x12	0.370*	0.009	−0.142*	0.103*	0.045*	−0.019	−0.038*	−0.051*	−0.113*	0.089*	0.149*	1											
x13	0.154*	0.080*	−0.034*	0.038*	0.003	0.005	0.003	−0.016	−0.048*	0.013	0.029*	−0.107*	1										
x14	0.042*	0.062*	−0.026*	−0.018	−0.018	0.031*	−0.002	−0.069*	−0.031*	−0.023	0.034*	−0.243*	−0.042*	1									
x15	−0.003	−0.043*	0.154*	0.051*	−0.001	0.044*	−0.027*	−0.084*	0.029*	−0.050*	−0.056*	−0.041*	−0.038*	0.129*	1								
x16	−0.131*	0.055*	−0.005	−0.061*	0.003	−0.015	0.047*	0.017	0.075*	0.056*	−0.016	0.031*	0.002	−0.091*	−0.430*	1							
x17	0.025*	0.049*	−0.108*	−0.059*	0.036*	−0.036*	0.018	0.077*	0.002	−0.041*	0.037*	−0.006	0.037*	−0.007	−0.170*	−0.406*	1						
x18	0.468*	0.011	−0.156*	0.184*	0.163*	0.007	0.010	0.131*	−0.068*	0.134*	0.238*	0.387*	0.073*	−0.103*	−0.023*	0.013	0.044*	1					
x19	−0.171*	0.035*	−0.014	−0.073*	−0.062*	0.005	0.041*	−0.011	0.025*	−0.057*	−0.008	−0.126*	−0.038*	0.022	−0.032*	0.028*	−0.001	−0.149*	1				
x20	0.198*	0.047*	−0.136*	0.069*	−0.002	0.007	−0.005	0.042	−0.088*	−0.083*	0.139*	0.068*	0.026*	−0.017	−0.008	−0.013	0.038*	0.162*	−0.004	1			
x21	0.303*	−0.006	−0.162*	0.126*	0.027*	−0.036*	−0.022	0.044*	−0.094*	−0.111*	0.131*	0.094*	0.067*	−0.006	0.021	−0.028*	0.039*	0.228*	0.004	−0.125*	1		
x22	0.207*	−0.020	−0.110*	0.153*	0.021	−0.033*	0.013	0.005	−0.060*	−0.087*	0.060*	0.044*	0.018	0.047*	0.044*	−0.052*	0.019	0.143*	0.003	−0.098*	−0.131*	1	
x23	0.087*	0.017	0.062*	0.002	−0.003	0.013	0.006	−0.009	−0.062*	0.039*	0.054*	0.076*	0.016	−0.067*	−0.088*	0.014	0.030*	0.039*	−0.042*	−0.067*	−0.070*	−0.113*	1

* Denotes statistical significance at the 5 percent level. Variable labels: x1 = male; x2 = age; x3 = number of children; x4 = married or cohabiting; x5 = white; x6 = black; x7 = asian; x8 = A level; x9 = O level (GCSE); x10 = further education; x11 = degree; x12 = employed; x13 = self employed; x14 = unemployed; x15 = home rented; x16 = home owned on a mortgage; x17 = home owned outright; x18 = permanent income; x19 = volatility of income; x20 = excellent health; x21 = good health; x22 = fair health; and x23 = ever saved as a child.

Table A4
Cross tabulation between the financial expectations of the young adult and that of their parent.

		Parental expectations (measured when individual was a child)			
		Optimistic	Pessimistic	Same	Total
Young adults expectations	Optimistic	73 *(2.89%)*	283 *(11.20%)*	142 *(5.62%)*	498 *(19.71%)*
	Pessimistic	260 *(10.29%)*	482 *(19.08%)*	944 *(37.37%)*	1686 *(66.75%)*
	Same	41 *(1.62%)*	191 *(7.56%)*	110 *(4.35%)*	342 *(13.54%)*
	Total	374 *(14.81%)*	1418 *(56.14%)*	734 *(29.06%)*	2526 *(100%)*

Highlighted cells along the lead diagonal signify common expectations across generations.

Appendix A

See Tables A1–A4.

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