

Saving Behaviour from Childhood to Early Adulthood: Analysis of British Panel Data

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Abstract: We explore the saving behaviour of children aged 11-15 using the British Household Panel Survey. Our findings suggest that parental allowances/pocket money (earnings from part-time work) lower (increase) the probability that a child saves. Parental saving behaviour does not influence that of their offspring, whereas parental financial optimism lowers the probability that a child saves. We then track the children into early adulthood (aged 16-29). Our findings suggest that having saved as a child has a large positive influence on the probability of saving on a monthly basis and on the amount saved as a young adult.

Key Words: Household Finances; Intergenerational Analysis; Panel Data; Saving.

JEL Classification: D12; D14

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1. Introduction and background

Over the past three decades, the empirical literature exploring household finances has been growing steadily (see Guiso et al., 2002, for a comprehensive review of this area). In general, economists have focused on specific aspects of the household financial portfolio such as debt (for example, Brown and Taylor, 2008), the demand for risky financial assets (for example, Hochguertel et al., 1997) and savings (for example, Browning and Lusardi, 1996). One area, which has attracted limited interest in the economics literature, concerns the intergenerational link between the attitudes towards finances of parents and their children. In contrast, there has been considerable recent interest in the relationship between the educational attainment of parents and their children (see Black and Devereux, 2011, for a recent survey), where extensive empirical evidence has supported the existence of a strong positive intergenerational association.¹

The aim of this paper is firstly to explore the determinants of children's saving behaviour focusing on whether an intergenerational link exists between the saving behaviour of parents and their children. We then explore the influence of saving behaviour as a child on saving behaviour in early adulthood. One might conjecture that an intergenerational link may exist between the attitudes towards finances between parents and their children as parents may seek to equip their children with particular values and life skills. A relatively extensive literature exists exploring the implications and importance of financial literacy for a range of financial decisions such as preparation for retirement, saving behaviour, stock market participation and financial portfolio diversification, with the focus generally being on U.S. households (see, for example, Lusardi and Mitchell, 2007), yet there has been limited discussion

¹ See Brown et al. (2011) for discussion of possible explanations for this positive intergenerational relationship.

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 in terms of personality traits 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.

Given the widespread concern that individuals are not saving enough especially in the context of saving for retirement (see, for example, the comprehensive review by Crossley et al., 2012), our empirical analysis will serve to shed light on saving behaviour at the early stages of the life cycle, which has attracted very little interest in the economics literature. It is apparent that attitudes towards finances may be shaped at an early age, which endorses our focus on childhood and early adulthood. For example, 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.² Our empirical analysis of the determinants of children’s saving behaviour as well as the implications of children’s saving behaviour for saving during early adulthood thus aims to enhance our understanding of financial decision-making at this early stage of the life cycle.

² Similarly, there has been growing interest amongst policy-makers in promoting financial literacy amongst children and adults to enhance financial outcomes. For example, ‘Economic-Well-being and Financial Capability’ form part of the UK National Curriculum for schools, albeit a non-statutory component, with the aim of teaching school pupils to manage their money and finances effectively. Guidance on how to incorporate personal finance education into the curriculum is provided nationally by the Department for Education, see <https://www.education.gov.uk>.

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. For wave one, interviews were conducted during the autumn of 1991. The same individuals are re-interviewed in successive waves – the last available being 2008.³ Since 1994, children aged 11 to 15 completed a short interview for the BHPS Youth Questionnaire. Thus, 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.

Specifically, in the BHPS Youth Questionnaire for years 1997 to 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. We pool these waves of the BHPS Youth Questionnaire in order to form an unbalanced panel of data with 6,201 observations consisting of 3,231 children, who are observed in the panel, on average, 3 times.

Saving Behaviour of Children Aged 11 to 15						
	Age 11	Age 12	Age 13	Age 14	Age 15	All ages
Save to buy things	41%	41%	45%	44%	45%	43%
Save and not spend	40%	39%	36%	34%	29%	35%
Spend immediately	19%	20%	19%	22%	26%	22%
OBSERVATIONS	1,157	1,295	1,251	1,259	1,239	6,201

The responses to this question by the age of the respondents are detailed above. It is apparent that the proportion of children responding in each category is relatively stable across the age range. The responses indicate that a significant proportion of children spend their money immediately and, hence, do not save.

³ The BHPS was replaced by *Understanding Society* in 2009.

The finances of children are arguably driven by two main sources: pocket money/allowances financed by parents; and earnings from part-time work such as paper rounds and baby-sitting.⁴ In our empirical analysis of the saving behaviour of children, we explicitly allow for the effects of allowances/pocket money and earnings from part-time work. In the BHPS, children aged 11 to 15 are asked about the amount of money they received in the form of pocket money or allowances. Specifically children are asked: *‘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.’* Additional information is also available relating to hours worked for pay and the money received from that work. Specifically, children were asked: *‘Last week, how many hours did you spend doing work for pay?’*⁵ They were also asked: *‘How much money did you earn last week? Do not include pocket money or allowances.’*⁶ 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

⁴ 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, Barnett-Verzat and Wolff, 2002, for a concise survey of this area). Barnett-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 5,300 families in France indicates heterogeneity in parental motives to give pocket money.

⁵ 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 hours per week, whereas during school holidays, 13 to 14 (15 to 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 hours 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 hours.

⁶ All monetary variables in the subsequent analysis are deflated using 2001 prices.

could relate to this specific type of work or could reflect informal work, possibly carried out at home. The responses to the questions on allowances and part-time work by the age of the respondents are summarised below.

Income Sources of Children Aged 11 to 15						
Sample = All Children						
Average	Age 11	Age 12	Age 13	Age 14	Age 15	All ages
Allowance (£)	6.51	8.07	9.03	11.35	12.81	9.59
Weekly Earnings (£)	1.28	1.70	3.19	4.51	7.40	3.63
Hours Worked	0.39	0.51	0.89	1.41	2.08	1.05
% Positive Hours	14%	17%	26%	32%	39%	26%
OBSERVATIONS	1,157	1,295	1,251	1,259	1,239	6,201
Sample = Children Reporting Positive Hours of Work						
Average	Age 11	Age 12	Age 13	Age 14	Age 15	All ages
Allowance (£)	8.70	8.17	8.56	9.91	10.75	9.53
Weekly Earnings (£)	5.24	7.87	10.92	13.45	18.20	12.72
Hours Worked	2.58	2.95	3.44	4.44	5.30	4.10
OBSERVATIONS	161	224	323	399	486	1,593

In accordance with expectations, the amount of allowances, the number of hours worked and weekly earnings all increase with age. This is also the case with the number of children reporting positive hours of work, with 39% of 15 year olds reporting positive hours of paid work as compared to only 14% of 11 year olds.

Parents, on the other hand, were asked: *‘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?’* The responses to this question provide information pertaining to the regular saving behaviour of parents. We are thus able to match the saving behaviour of parents with that of their offspring: 36% of the matched sample indicate that both parents and offspring save whilst 13% indicate that neither parents nor their offspring save. 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.⁷

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:

$$\begin{aligned} S_{it}^C &= 1 \quad \text{if} \quad S_{it}^{C*} = \gamma \log(A_{it}) + \theta \log(W_{it}) + \mathbf{F}_{it}' \boldsymbol{\phi} + \mathbf{X}_{lit}' \boldsymbol{\varphi} + \varepsilon_{it} > 0 \\ S_{it}^C &= 0 \quad \text{otherwise} \end{aligned} \quad (1)$$

where there are $i=1, \dots, N$ children, and $t=1, \dots, T$ time periods, S_{it}^{C*} is a latent dependent variable, $\log(A_{it})$ is the allowance received by the child in the previous week, $\log(W_{it})$ denotes the pay received by the child from part-time work in the previous week, \mathbf{F}_{it} is a vector of the amount saved by parents and their financial expectations, and \mathbf{X}_{lit} is a vector of additional child and household characteristics (see below). The error term in equation (1) can be written as a function of two components, an individual specific element that does not vary with time and a remaining component, which is assumed to be uncorrelated over time, $\varepsilon_{it} = \alpha_i + \nu_{it}$. The individual specific unobservable effect is denoted by α_i and ν_{it} is a random error term. We adopt a random effects specification, where $\nu_{it} \sim IN(0, \sigma_\nu^2)$. To marginalise the likelihood, it is assumed that, conditional on the covariates in equation (1), the α_i are $IN(0, \sigma_\alpha^2)$ and independent of ε_{it} and the covariates. Since the individual specific time invariant random effect, α_i , captures unobserved individual heterogeneity, the random effects probit specification controls for unobserved heterogeneity. The correlation between the individual specific element of the error term is a constant given by $\rho = \text{corr}(\varepsilon_{ik}, \varepsilon_{il}) = \sigma_\alpha^2 / (\sigma_\alpha^2 + \sigma_\nu^2) \quad k \neq l$, which represents the proportion of the total

⁷ We control for the financial expectations of the parent who is specified as the head of household.

variance contributed by the panel variance component. For a full discussion of the random effects probit model see Arulampalam (1999).

The child may be more likely to save if he/she has saved in the past. Hence, in order to explore the robustness of our findings, we explore the effect of allowing for state dependence in the child's saving behaviour by analysing the dynamics of their saving behaviour over the time period. The child's likelihood of saving over the period is modelled via a random effects dynamic panel estimator as follows:

$$\begin{aligned} S_{it}^C &= 1 \quad \text{if} \quad S_{it-1}^{C*} = \pi S_{it-1}^C + \mathbf{G}_{it}' \boldsymbol{\beta} + \mathbf{Z}_i' \boldsymbol{\gamma} + \alpha_i + \omega_{it} > 0 \\ S_{it}^C &= 0 \quad \text{otherwise} \end{aligned} \quad (2a)$$

Wooldridge (2002) shows how an appropriate treatment of the individual effect can be determined by specifying the following:

$$\alpha_i = \alpha_0 + \alpha_1 S_{i0} + \bar{\mathbf{G}}_i' \boldsymbol{\phi} + \nu_i \quad \nu_i \sim N[0,1] \quad (2b)$$

where S_{i0} is the initial state, i.e. whether the child saves when first observed in the panel. This approach relies on the time invariant characteristics, \mathbf{Z}_i , and group means of the time varying covariates, $\bar{\mathbf{G}}_i$, where substitution of equation (2b) into (2a) produces an augmented random effects model. Although it is assumed that ω_{it} is white noise, the composite error term, $\psi_{it} = \nu_i + \omega_{it}$, is likely to be correlated over time due to the individual specific time invariant ν_i term. The individual specific random effects specification adopted implies equi-correlation between the ψ_{it} in any two different time periods and is given by the following constant:

$$\rho = \text{corr}(\psi_{ik}, \psi_{il}) = \sigma_\nu^2 / (\sigma_\nu^2 + \sigma_\omega^2) \quad k \neq l.$$

The covariates are defined as in equation (1), note that $[\log(A_{it}), \log(W_{it}), \mathbf{F}_{it}, \mathbf{X}_{lit}] \in \mathbf{G}_{it}, \mathbf{Z}_i$. These variables are defined below. The child's past saving behaviour, that is whether the child saved in the previous year, is given by the binary indicator, S_{it-1}^C . The analysis is based on a panel

of 2,798 observations covering the period 1997-2001.⁸ State dependence in terms of the statistical significance of S_{it-1}^C and the size of π , as well as the importance of heterogeneity, as indicated by ρ , are investigated by estimating equations (2a,b).

We also control for child characteristics including: 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 particular: household labour income last month; household non labour income last month;⁹ 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;¹⁰ 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; year controls; and region controls. Summary statistics of the above variables are presented in Table 1A.¹¹

⁸ We have excluded the year 2005 from the analysis given the three year gap in the panel and the first year that the child is observed in the data is lost due to the inclusion of the lagged dependent variable.

⁹ This includes household income from: pensions; all state benefits; investments (excluding savings); and other transfers, e.g. from education grants, sickness insurance, maintenance, foster allowance and payments from absent family members.

¹⁰ The educational attainment of the parent may be correlated with their financial literacy.

¹¹ For all monetary covariates, in order to convert to natural logarithms, we add one to the level of the variable in question.

2.3. Results

Random Effects Probit Framework

In the first column of Table 2, we present the findings from the random effects probit analysis, i.e. from estimating equation (1). Clearly, over time the unobserved individual child heterogeneity of the panel is of importance both in terms of magnitude and statistical significance in explaining the residual variance, as can be seen by the estimated ρ 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 per cent increase in the child's allowance is associated with a decrease in the probability that the child saves by 2.1 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.

The amount of monthly savings of the parents has a statistically insignificant effect on the saving behaviour of their children. Hence, it would appear that the saving behaviour of parents does not influence the saving behaviour of their offspring, which may reflect the possibility that parents do not share information regarding such household financial matters with their children. 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 to 3 percentage points. Hence, the financial outlook of 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 associated with increasing the probability that the child saves.

Turning briefly to comment on the additional control 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 yet no clear pattern was evident in the raw data discussed in Section 2 above. 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. There is no influence from the level of household labour and non labour income on the probability of the child saving, rather it would appear that wealth effects are more important as proxied by housing tenure. 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, the magnitudes of the effects stemming from the financial attitudes of the parents are around a third to a half of the size of the marginal effect associated with whether the child intends to go to college or sixth form.¹²

¹² 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.

Dynamic Panel Probit Framework

We now explore the robustness of our empirical findings once the potential state dependence of the child's saving behaviour is allowed for. The results of estimating equations (2a,b) are summarised in the second column of Table 2. Given the statistical significance of the random effects term, it is apparent that unobserved heterogeneity is once again clearly of importance in explaining unsystematic variation.

There is evidence of state dependence since whether the child saved in the previous period is positively correlated with the child saving in the current period. There is a noticeable effect from the financial expectations of the parents, which continue to have a statistically significant influence once state dependence is allowed for. For example, the effect of whether the child's parent expects no change in their future financial situation on the child's saving behaviour is comparable in terms of magnitude to that of the lagged dependent variable. A noticeable difference to the results from the random effects probit framework is that, once state dependence is incorporated into the model, there is no role for financial optimism. Not surprisingly, a number of covariates are now driven to statistical insignificance including the weekly allowance that the child receives which previously had the largest effect. However, the pay that the child obtains from part-time work remains statistically significant where a 1 per cent increase in the child's pay from employment increases the probability of saving by 2 percentage points.

3. Saving Behaviour During Early Adulthood

3.1 Data and Methodology

From the sample of 3,231 children drawn from the BHPS Youth survey, 2,426 individuals can be tracked into the full BHPS survey post 1997, and beyond using Understanding Society, which is the follow-up survey to the BHPS, potentially through to 2010/11, where we observe the individuals in early adulthood. These

young adults are observed 3 times on average in the panel yielding 5,518 observations. The average age is 19 with a minimum (maximum) age of 16 (29). The average number of years between observing the individual as a child and as a young adult is 5. 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 , which is defined from the same question that provides information on parental monthly saving discussed in Section 2.1 above, and 35% of the sample saves on a monthly basis. In our sample of matched information on the individual's saving behaviour as a child and in early adulthood, 32% of the sample saved both as a child and in early adulthood, whereas 14% did not save as a child and in early adulthood. We initially estimate the following model:

$$\begin{aligned} S_{it}^A &= 1 & \text{if } S_{it}^{A*} = \mathbf{X}_{2it}' \boldsymbol{\lambda}_1 + \psi_1 S_{it}^C + \varepsilon_{it} > 0 \\ S_{it}^A &= 0 & \text{otherwise} \end{aligned} \quad (3)$$

where there are $i=1, \dots, N$ individuals followed from childhood, and $t=1, \dots, T$ time periods, S_{it}^{A*} is a latent dependent variable. Equation (3) is estimated as a random effects probit specification as detailed in Section 2.1. The vector \mathbf{X}_{2it} includes controls for: age; gender; income the individual received from employment in the last month and other sources in the last month;¹³ 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 the case of parental education with no education as the omitted category); labour market status (with out of the labour market as the omitted category) and the individual's housing tenure (as defined above in section 2.1). Our key covariate of

¹³ This includes all state benefit income and transfer income, e.g. from education grants, sickness insurance, maintenance, foster allowance and payments from absent family members.

interest is whether the individual saved as a child, S_{it}^C . Hence, we focus on the magnitude, sign and statistical significance of ψ_1 . As argued above, the individual may be more likely to save if he/she has saved in the past. Thus, we re-estimate equation (3) allowing for state dependence by conditioning on S_{it-1}^A , following the Wooldridge (2002) approach outlined above in Section 2.1.

Given that the BHPS also 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 early adulthood:

$$\log(S_{it}^A) = \mathbf{X}_{2it}' \lambda_2 + \psi_2 S_{it}^C + \varepsilon_{it} = \mathbf{H}_{it}' \zeta + \varepsilon_{it} \quad (4)$$

We report marginal effects, which are calculated by focusing on the derivative of the conditional expected value of the truncated logged response, given the covariates, with respect to the covariates. The conditional expected value function of the truncated logged response savings $\log(S_{it}^A)$ is given by the following $E\{\log(S_{it}^A) | \mathbf{H}_{it}\} = \Phi(\mathbf{H}_{it}' \zeta / \sigma) \mathbf{H}_{it}' \zeta + \sigma \{\phi(\mathbf{H}_{it}' \zeta / \sigma)\}$ and will be heavily weighted towards zero, where ϕ and Φ denote the density and cumulative distributions of the standard normal, respectively. For a continuous variable, differentiation of the expected value function yields:

$$\partial E\{\log(S_{it}^A) | \mathbf{H}_{it}\} / \partial \mathbf{H}_{it} = \Phi(\mathbf{H}_{it}' \zeta / \sigma) \zeta = \text{prob}\{\log(S_{it}^A) > 0 | \mathbf{H}_{it}\} \zeta \quad (5)$$

Assuming the errors are normally distributed, the probability of a non-censored observation, or scaling factor, is given by: $\Phi(\mathbf{H}_{it}' \zeta / \sigma)$ evaluated at the means of the sample covariates. An approximation to the scaling factor is the proportion of uncensored observations. The marginal effects reported for the tobit model are the coefficients multiplied through by the scaling factor.

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. Saving to buy specific things may capture an aptitude for budgeting at an early age, whereas saving with no specific purpose arguably may reflect precautionary saving motives. Hence it is interesting to explore if these two different motivations for saving during childhood have distinct influences on saving behaviour as an adult. In the random effects probit model, the random effects dynamic probit model and the random effects tobit model, the binary control s_{it}^C is replaced by two dummy variables denoting the stated reason for saving. Table 1B provides summary statistics for the variables during early adulthood based on the sample of young adults.

Finally, a potential criticism of the analysis is that the average number of years between observing the individual as a child and then subsequently during early adulthood is only 5. To ascertain whether this influences our findings, we evaluate how saving behaviour as a child influences saving behaviour as a young adult over a longer time horizon. Hence, we focus on a subsample of adults where this gap is 10 or more years. This yields a subsample of 1,299 observations, where the average age of the adult is 24, with such adults arguably being more likely to be living independently.

3.2 Results

Random Effects Probit Framework

The first column of Table 3 Panel A presents the results of estimating equation (3). Clearly, the panel nature of the data is important given the statistical significance of the ρ parameter. The probability that the individual saves on a monthly basis decreases with age, which may represent increasing financial commitments at this stage of the life cycle and contrasts with the positive association between age and the probability of saving as a child. Labour income and non labour income both increase

the probability of saving on a monthly basis, where a 1 percent increase in labour (non labour) income is associated with approximately a 2.6 (1.6) percent increase in the likelihood of saving. These effects are similar in magnitude to that found relating to the influence of pay from part-time work on the probability that the child saved. The probability of saving on a monthly basis is increasing in educational attainment, where an individual with a degree is 11 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 17 percentage points less likely to save. Whether the individual owns their home outright or on a mortgage is associated with a higher probability of saving on a monthly basis, which potentially reflects a wealth effect.

Whether the individual saved during childhood has a large effect on the probability of saving on a monthly basis in adulthood at around 15 percentage points and is only outweighed by the effects of age and unemployment. In Panel B of Table 3, we decompose the binary indicator of whether the individual saved as a child according to saving motive. Interestingly, whilst saving to buy things and saving not to spend are both positively associated with the probability of saving as an adult, the dominant effect is from saving to buy things. 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.

The results shown in Table 4 are based on the subsample of young adults where the gap between the interview as a child and that as a young adult is a minimum of 10 years. The columns of Table 4 mirror that of Table 3 and there are two panels in Table 4, which focus on having saved as a child (Panel A) and then

decompose the reasons for saving as a child (Panel B). The results show that whether the individual saved as a child has a very similar effect upon the probability of saving during adulthood, i.e. the magnitude of the effect is almost identical to that of the full sample. Once the reasons for saving during childhood are decomposed into the motives for saving, as previously found, it is saving to buy things that dominates in terms of both magnitude and statistical significance.

Random Effects Dynamic Probit Framework

To investigate the robustness of the results, we now allow for state dependence, where the results are presented in the second column of Table 3 Panel A. As with the previous 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 24 percentage point higher probability of currently saving. Whilst some covariates have now been driven to statistical insignificance, the influence of saving 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 3 Panel B 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 11 percentage points. Focusing on the subsample of individuals where savings behaviour is analysed over a longer period, the results in Table 4 Panel A show that the effect of saving as a child remains. However, due to the limited number of observations, the analysis where the child's saving motives are decomposed has now been driven to statistical insignificance.

Random Effects Tobit Framework

The final column of Table 3 Panel A presents the results from estimating equation (4). 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 saved as a child is associated with 49 percentage point higher level of monthly savings. These effects are clearly large and only outweighed by the effects of age, self-employment and unemployment. 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 3 Panel B. In the case of the larger gap between the interview as a child and the follow-up interview as an adult, the results presented in Table 4 reveal that our findings are robust over a longer time horizon.

4. Conclusion

This paper contributes to the growing empirical literature exploring household finances and, specifically, contributes to our understanding of a relatively neglected area of economics relating to the saving behaviour of children and young adults. Although as Crossley et al. (2012) argue, most children do not hold financial assets or face any ‘substantive financial decisions’, 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 related to, for example, a house purchase. Analysis of the saving behaviour of children may shed light on financial decision-making at an early stage of the life-cycle and how such saving behaviour may influence financial behaviour later on in life.

To be specific, we explore the determinants of children’s saving behaviour using British panel data focusing on the role of parents via giving allowances to their children, their own saving behaviour and their own financial outlook. 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. Our findings also suggest that the saving behaviour of parents does not influence the saving behaviour of their offspring, although the financial outlook of parents does affect the saving behaviour of children.

Our empirical findings, thus, reveal some interesting insights relating to the saving behaviour of children and indicate that such behaviour is influenced by a variety of factors, some of which can be shaped by parents via, for example, the provision of allowances/pocket money or encouraging children to carry out some paid work. In addition, it is apparent that the extent to which parents share their expectations regarding household finances with their children may also influence the saving behaviour of their offspring. Parents may thus be able to instil certain attitudes towards finances in their children, which consequently may be taken by children into adulthood. 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. Our findings thus indicate that shaping the financial behaviour of children may have long lasting effects in terms of financial behaviour and decision-making as an adult.

With increasing levels of debt and relatively low levels of saving at the household level, it is apparent that exploring the extent to which the saving behaviour and the financial management skills of children can be influenced provides potentially important information from a policy-making perspective. We hope, therefore, that our empirical findings will serve to stimulate further research into this important, yet relatively unexplored, aspect of household finances and intergenerational analysis.

References

- Arulampalam, W. (1999). A Note on Estimated Effects in Random Effect Probit Models. *Oxford Bulletin of Economics and Statistics*, 61, 597–602.
- Barnet-Verzat, C. and F.-C. Wolff (2002). Motives for Pocket Money Allowance and Family Incentives. *Journal of Economic Psychology*, 23, 339-366.
- Black, S. E. and P. J. Devereux (2011). Recent Developments in Intergenerational Mobility. In *Handbook of Labor Economics*, O. Ashenfelter and D. Card (Eds.) Chapter 16, pp. 1487-1541.
- Brown, S. and K. Taylor (2008). Household Debt and Financial Assets: Evidence from Germany, Great Britain and the USA. *Journal of the Royal Statistical Society, Series A*, 171(3), 615-643.
- Brown, S., McIntosh, S. and K. Taylor (2011). Following in your Parents' Footsteps? Empirical Analysis of Matched Parent-Offspring Test Scores. *Oxford Bulletin of Economics and Statistics*, 73(1), 40-58.
- Browning, M. and A. Lusardi (1996). Household Saving: Micro Theories and Micro Facts. *Journal of Economic Literature*, 34(4), 1797-1855.
- Crossley, T. F., Emmerson, C. and A. Leicester (2012). Raising Household Saving. British Academy Policy Centre Publication, February 2012.
- Financial Services Authority (2006). Personal Finance Education in Schools: A UK Benchmark Study. June 2006.
- Furnham, A. (2001). Parental Attitudes to Pocket Money/Allowances for Children. *Journal of Economic Psychology*, 22(3), 397-422.
- Grinstein-Weiss, M., Spadar, J., Yeo, Y. H., Taylor, A. and E. Books Freeze (2011). Parental Transfer of Financial Knowledge and Later Credit Outcomes among Low- and Moderate-Income Homeowners. *Children and Youth Services Review*, 33, 78-85.

- Guiso, L., Haliassos, M. and T. Jappelli (2002). *Household Portfolios*, MIT Press.
- Hochguertel, S., Alessie, R., and A. Van Soest (1997). Savings Accounts versus Stocks and Bonds in a Household Portfolio Allocation. *Scandinavian Journal of Economics*, 99(1), 81-97.
- Lusardi, A. and O. S. Mitchell (2007). Baby Boomer Retirement Security: The Roles of Planning, Financial Literacy, and Housing Wealth. *Journal of Monetary Economics*, 54, 205-224.
- Wooldridge, J. (2002). *Econometric Analysis of Cross Section and Panel Data*. MIT Press.

Table 1A: Summary statistics child sample

	MEAN	STD
<u>Child characteristics</u>		
Currently saves [#]	0.786	0.410
Male	0.505	0.500
Age	13.035	1.423
Age squared	171.923	37.253
Log weekly allowance	1.687	1.094
Log weekly pay	0.592	1.095
No computer at home	0.282	0.450
Intends to go to college	0.723	0.447
Natural child of parent	0.917	0.275
<u>Parent/household characteristics</u>		
Number of children	1.483	0.595
Number of adults	1.352	0.479
Single parent	0.213	0.409
Log labour income	7.729	0.693
Log non labour income	6.410	1.172
O level (GCSE) [#]	0.196	0.397
A level [#]	0.098	0.298
Further education [#]	0.251	0.434
Degree [#]	0.108	0.311
Home owned outright [#]	0.089	0.285
Home owned on mortgage [#]	0.598	0.490
Home rented [#]	0.203	0.403
Log savings of parents	2.295	2.660
Head of household expects finances to improve [#]	0.283	0.451
Head of household expects no change in finances [#]	0.532	0.499
OBSERVATIONS	6,201	

[#] denotes a binary variable.

Table 1B: Summary statistics adult sample

	MEAN	STD
Currently saves [#]	0.358	0.479
Log monthly Savings	1.289	1.878
Age	18.671	2.793
Age squared	356.388	113.070
Male [#]	0.482	0.500
Log labour income	5.8141	5.080
Log non labour income	2.6545	3.868
Number of children	0.609	0.948
Married or cohabiting [#]	0.051	0.220
White [#]	0.817	0.386
Black [#]	0.064	0.245
Asian [#]	0.018	0.132
O level (GCSE) [#]	0.320	0.466
A level [#]	0.266	0.442
Further education [#]	0.114	0.317
Degree [#]	0.042	0.199
Employee [#]	0.356	0.479
Self employed [#]	0.015	0.122
Unemployed [#]	0.086	0.281
Own home outright [#]	0.010	0.100
Own home on a mortgage [#]	0.141	0.349
Rent home from council [#]	0.124	0.330
Saved as a child [#]	0.825	0.380
Saved as a child to buy things [#]	0.492	0.500
Saved as a child not to spend [#]	0.413	0.492
OBSERVATIONS	5,518	

[#] denotes a binary variable.

Table 2: Determinants of children's saving behaviour

	RANDOM EFFECTS PROBIT		RANDOM EFFECTS DYNAMIC PROBIT	
	M.E.	tstat	M.E.	tstat
<u>Child characteristics</u>				
Saved in previous period	–	–	0.0628**	(2.10)
Male	0.0195	(1.52)	0.0194	(1.31)
Age	0.1903***	(2.77)	0.2091	(1.43)
Age squared	-0.0077***	(2.95)	-0.0083	(1.55)
Log weekly allowance	-0.0211***	(4.12)	-0.0034	(0.37)
Log weekly pay	0.0137***	(2.78)	0.0209**	(2.51)
No computer at home	-0.0507***	(3.83)	-0.0267	(1.16)
Intends to go to college	0.0587***	(4.91)	0.0503**	(2.25)
Natural child of parent	0.0467**	(2.45)	0.0056	(0.24)
<u>Parent/household characteristics</u>				
Number of children	-0.0046	(0.47)	-0.0008	(0.04)
Number of adults	-0.0001	(0.02)	0.0014	(0.05)
Single parent	-0.0514***	(2.73)	-0.0555	(0.90)
Log labour income	-0.0008	(0.07)	-0.0026	(0.12)
Log non labour income	-0.0007	(0.01)	0.0171	(1.48)
O level (GCSE)	0.0203	(1.23)	-0.0087	(0.24)
A level	0.0260	(1.22)	0.0643	(1.42)
Further education	0.0466***	(2.86)	0.0228	(1.14)
Degree	0.0433**	(1.97)	0.0234	(1.09)
Own home outright	0.0484*	(1.75)	-0.1269	(1.39)
Own home on a mortgage	-0.0030	(0.15)	-0.0061	(0.09)
Rent home from council	-0.0253	(1.18)	-0.0400	(0.75)
Log savings of parents	0.0013	(0.57)	-0.0050	(1.14)
Head of household expects finances to improve	-0.0233***	(2.85)	-0.0068	(0.32)
Head of household expects no change in finances	-0.0284**	(2.14)	-0.0540**	(2.52)
<u>Controls</u>				
	Year and region of residence			
ρ (p value)	0.580 p=0.000		0.301 p=0.000	
Wald chi squared (p value)	178.36 p=0.000		282.23 p=0.000	
OBSERVATIONS	6,201		2,798	

***, **, * denotes statistical significance at the 1, 5 and 10 per cent levels respectively.

Table 3: Determinants of savings behaviour in early adulthood

PANEL A	RANDOM EFFECTS PROBIT		RANDOM EFFECTS DYNAMIC PROBIT		RANDOM EFFECTS TOBIT	
	M.E.	tstat	M.E.	tstat	M.E.	tstat
Saved in previous period	—	—	0.2356 ^{***}	(5.93)	—	—
Age	-0.1801 ^{***}	(5.58)	-0.4057 ^{**}	(1.99)	-0.4937 ^{***}	(4.47)
Age squared	0.0039 ^{***}	(5.15)	0.0098 [*]	(1.87)	0.0110 ^{***}	(4.33)
Male	-0.0155	(0.97)	-0.2669	(1.23)	-0.0315	(0.60)
Log labour income	0.0256 ^{***}	(14.74)	0.0257 ^{***}	(5.26)	0.0919 ^{***}	(15.11)
Log non labour income	0.0160 ^{***}	(8.39)	0.0102 ^{**}	(2.06)	0.0500 ^{***}	(7.87)
Number of children	0.0019	(0.22)	0.0243	(0.59)	0.0112	(0.40)
Married or cohabiting	0.0208	(0.60)	-0.1251	(0.49)	0.0413	(0.38)
White	-0.0073	(0.26)	-0.0579	(0.82)	-0.0596	(0.64)
Black	-0.0483	(1.16)	-0.1198	(1.33)	-0.1813	(1.31)
Asian	-0.0157	(0.24)	-0.0339	(0.29)	0.0029	(0.01)
O level (GCSE)	0.0268	(1.28)	0.0880	(0.88)	0.0838	(1.21)
A level	0.0614 ^{***}	(2.63)	0.0603	(0.52)	0.2302 ^{***}	(3.01)
Further education	0.0866 ^{***}	(3.61)	0.0320	(1.21)	0.3293 ^{***}	(3.83)
Degree	0.1054 ^{**}	(2.15)	0.1598	(0.19)	0.3639 ^{**}	(2.56)
Employee	0.0355 [*]	(1.81)	0.0587	(1.08)	0.2183 ^{***}	(3.48)
Self employed	0.1173 ^{**}	(2.08)	0.3258 ^{**}	(2.07)	0.5620 ^{***}	(3.17)
Unemployed	-0.1742 ^{***}	(5.38)	0.0547	(0.61)	-0.6230 ^{***}	(5.64)
Own home outright	0.0788 ^{***}	(3.05)	0.0290	(0.27)	0.2886 ^{***}	(3.42)
Own home on a mortgage	0.0787 ^{***}	(3.93)	0.1059	(1.42)	0.2806 ^{***}	(4.26)
Rent home from council	-0.0598 ^{**}	(2.24)	-0.1887 [*]	(1.75)	-0.2188 ^{**}	(2.46)
Saved as a child	0.1493 ^{***}	(6.98)	0.1847 ^{***}	(3.78)	0.4931 ^{***}	(6.79)
Controls			Year and region of residence			
ρ (p value)	0.329 p=0.000		0.221 p=0.058		0.285 p=0.000	
Wald chi squared (p value)	517.79 p=0.000		138.22 p=0.000		694.59 p=0.000	
OBSERVATIONS	5,518		966		5,518	

*** ** * denotes statistical significance at the 1, 5 and 10 per cent levels respectively.

Table 3 Cont.: Determinants of savings behaviour in early adulthood

<u>PANEL B</u>	RANDOM EFFECTS PROBIT		RANDOM EFFECTS DYNAMIC PROBIT		RANDOM EFFECTS TOBIT	
	M.E.	tstat	M.E.	tstat	M.E.	tstat
Saved as a child to buy things	0.1235***	(7.06)	0.1119***	(3.53)	0.4120***	(7.01)
Saved as a child not to spend	0.0533***	(2.97)	0.0461**	(2.45)	0.1666***	(2.80)
Controls			As in panel A			
ρ (p value)	0.330 p=0.000		0.226 p=0.054		0.285 p=0.000	
Wald chi squared (p value)	517.45 p=0.000		131.81 p=0.000		697.25 p=0.000	
OBSERVATIONS	5,518		966		5,518	

***,**,* denotes statistical significance at the 1, 5 and 10 per cent levels respectively.

Table 4: Determinants of savings behaviour in early adulthood – 10 year gap

<u>PANEL A</u>	RANDOM EFFECTS PROBIT		RANDOM EFFECTS DYNAMIC PROBIT		RANDOM EFFECTS TOBIT	
	M.E.	tstat	M.E.	tstat	M.E.	tstat
Saved as a child	0.1477***	(3.26)	0.2043**	(2.48)	0.5890***	(3.21)
Controls			As in table 3A			
ρ (p value)	0.279 p=0.000		0.201 p=0.054		0.303 p=0.000	
Wald chi squared (p value)	107.24 p=0.000		78.15 p=0.000		172.24 p=0.000	
OBSERVATIONS	1,299		308		1,299	
<u>PANEL B</u>	RANDOM EFFECTS PROBIT		RANDOM EFFECTS DYNAMIC PROBIT		RANDOM EFFECTS TOBIT	
	M.E.	tstat	M.E.	tstat	M.E.	tstat
Saved as a child to buy things	0.0883***	(2.57)	0.0454	(0.85)	0.3355**	(2.45)
Saved as a child not to spend	0.0362	(1.04)	0.0235	(0.42)	0.1415	(1.03)
Controls			As in table 3A			
ρ (p value)	0.280 p=0.000		0.199 p=0.054		0.303 p=0.000	
Wald chi squared (p value)	106.25 p=0.000		78.27 p=0.000		169.16 p=0.000	
OBSERVATIONS	1,299		308		1,299	

***,**,* denotes statistical significance at the 1, 5 and 10 per cent levels respectively.