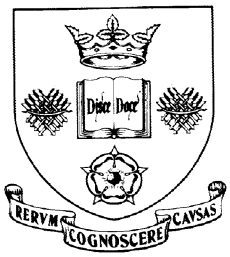
Sheffield Economic Research Paper Series

SERP Number: 2012018

ISSN 1749-8368



Sarah Brown
Preety Srivastava
Karl Taylor

Preach What You Practice? Donating Behaviour of Parents and Their Offspring

August 2012

Department of Economics
University of Sheffield
9 Mappin Street
Sheffield
S1 4DT
United Kingdom
www.shef.ac.uk/economics

Preach What You Practice?
Donating Behaviour of Parents and their Offspring

Sarah Brown[a], Preety Srivastava[b] and Karl Taylor[a]

[a]Department of Economics, University of Sheffield, U.K.
[b]Faculty of Business and Economics, Monash University, Australia

Abstract: Using data drawn from the U.S. *Panel Study of Income Dynamics*, we explore the relationship between the donating behaviour of parents and that of their children aged less than 18. Furthermore, we exploit information relating to whether or not parents encourage their children to donate to charity in order to unveil information related to the intergenerational transmission of philanthropic behaviour. Our findings suggest that whether a child donates to charity is influenced by positive effects from whether the parent donates to charity as well as from whether the parent talks to their child about donating to charity. In addition, whether the parent donates to charity has an indirect influence via its positive effect on the probability that the parent talks to the child about donating to charity. Further, we find that the influence of whether the parent donates to charity on the probability that the child donates to charity is particularly heightened in terms of both magnitude and statistical significance in the context of parental donations to religious causes.

Key Words: Charity; Donations; Endogenous Multivariate Probit Model; Intergenerational Relationships.

JEL Classification: D19; H24; H41; H31

Acknowledgements: We are very grateful to the Institute for Social Research, University of Michigan for supplying the *Panel Study of Income Dynamics* 2001 to 2007. We are also very grateful to Pamela Lenton and Steven McIntosh for excellent comments and suggestions. The usual disclaimer applies.

June 2012

1. Introduction and Background

Philanthropic behaviour has attracted considerable attention in the economics literature, with theoretical contributions focusing on explaining why some individuals and households give away a portion of their income, whilst empirical contributions have focused on identifying the determinants of donating behaviour. Such interest in this particular facet of individual and household behaviour is not surprising given that recent figures from *Giving U.S.A. 2011* estimate total charitable contributions in the U.S. in 2011 at $290.89 billion.[1]

Over the last four decades, the literature on the economics of charity has focused on analysis of the decision to donate at the individual or household level, with particular attention paid to the impact of tax deductibility and the corresponding price and income effects. The empirical analysis of charitable donations has benefited from both methodological advances with respect to econometric techniques as well as the increased availability and quality of individual and household level data. Andreoni (2006) provides a comprehensive survey of the influences on charitable donations established in the existing literature. For example, Auten et al. (2002) find that income is an important determinant of donor responsiveness, whilst, according to Glenday et al. (1986), donations increase with age.

One area, which has attracted less interest in the existing literature, concerns the relationship between the donating behaviour of parents and their offspring. Such a gap in the literature is surprising given that intergenerational relationships have attracted considerable interest in other areas of economics. For example, a vast literature exists exploring the determinants and implications of human capital, with recent interest in intergenerational aspects such as the link between the human capital of parents and their children (see, for example, Cunha and Heckman, 2007, and Blanden et al., 2007). Such an intergenerational relationship has clear implications for the transmission of income and wealth between parents

[1] The figure relates to total charitable contributions from U.S. individuals, corporations and foundations and includes both cash and in-kind donations.

and their offspring (see, Solon, 1999). For example, Charles and Hurst (2003) estimate the intergenerational elasticity of wealth between parents and their adult children at 0.37 for the U.S. using data from the *Panel Study of Income Dynamics*.

Similarly, there is a growing empirical literature exploring intergenerational relationships related to attitudes and behaviours such as trust, risk attitudes and sociability. For example, Guiso et al. (2008) model the intergenerational transmission of priors about the trustworthiness of others within an overlapping generations framework, whilst Dohmen et al. (2007) explore the intergenerational transmission of trust and risk attitudes using the *German Socio-Economic Panel*. Finally, using data drawn from the U.S. *National Longitudinal Survey of Youth* 1979, Okumura and Usui (2010) explore the effect of parents' social skills on their children's sociability. Thus, the intergenerational transmission of a wide range of skills, economic outcomes and attitudes has been the subject of much theoretical and empirical scrutiny in the economics literature.

In contrast, the intergenerational relationship between the donating behaviour of parents and their offspring remains relatively unexplored in the economics literature, which may reflect the shortage of data in this area. One interesting exception is Wilhelm et al. (2008), who estimate the correlation between the generosity of parents and that of their adult children using data drawn from the U.S. *Panel Study of Income Dynamics* (*PSID*). The findings, which are based on a wide array of econometric techniques and specification tests, indicate a strong positive correlation between the religious donations of parents and their adult children, a correlation in the same order of magnitude as that for intergenerational relationships with respect to income and wealth. For secular giving, a positive correlation remains, albeit, smaller in magnitude.

We contribute to this literature by exploring the relationship between the donating behaviour of parents and that of their children aged less than 18, i.e. pre-adulthood. Our focus

on younger individuals reflects the importance of parental influence and guidance during this stage of the life cycle. Furthermore, we exploit information relating to whether or not parents encourage their children to donate to charity in order to unveil information related to the transmission of philanthropic behaviour in addition to establishing the existence of intergenerational correlations in such behaviour. Such an approach ties in with findings from the child psychology literature, which suggest that role-modelling may play an important role in developing this type of pro-social altruistic behaviour in young children (see, for example, Grusec, 1991, for a review of the psychology literature on the socialisation of altruism in young children).

Our findings suggest that whether a child donates to charity is influenced by positive effects from whether the parent donates to charity as well as by whether the parent talks to their child about donating to charity. In addition, whether the parent donates to charity has an indirect effect via its positive influence on the probability that the parent talks to the child about donating to charity. Further, we find that the influence of whether the parent donates to charity on the probability that the child donates to charity is particularly heightened in terms of both magnitude and statistical significance in the context of parental donations to religious causes.

2. Data and Methodology

We use data drawn from the U.S. *Panel Study of Income Dynamics* (*PSID*), which is a panel of individuals ongoing since 1968 conducted at the Institute for Social Research, University of Michigan. We focus on data from the 2002 and 2007 *Child Development Supplements (CDS)*, which contain additional information relating to parents in the *PSID* and their children, with the objective being to provide information on early human capital formation. In particular, the primary caregiver was asked: *Do you ever talk to your child about giving some of (his/her) money - if only a few pennies - to a church, synagogue, or another charity*?

The responses to this question potentially unveil information related to how charitable behaviour is transmitted across generations. We use such responses to create a binary indicator, Y_2 , which takes the value of one if the parent talks to the child about such donations. The child was then asked: *Did you give some of your money last year - if only a few pennies - to a church, synagogue, or another charity that helps people who are not part of your family*? The responses to this question, which provide information on the donating behaviour of children, were used to create a binary indicator, Y_3, which takes value one if the child makes such donations.

We match the information in the *CDS* with that available in the main head of family *PSID* questionnaires for 2001 and 2007, which include a series of detailed questions relating to giving to charity.[2] Households are asked about total donations to charity over the respective calendar years, split into religious and secular causes, providing detailed information about the parent's donating behaviour. We use the responses to this set of questions to create a binary indicator of whether the parent donates to charity, Y_1. Our matched sample of children and their parents comprises 3,130 observations, where the children are aged between 8 and 17 years old. The data reveals that 72% of children report that they donate to charity compared to 60% of parents, whilst 70% of parents report that they talk to their child about donating to charity. In the matched sample, 45% of the observations are characterised by the parent and the child both donating to charity, with only 13% reporting that neither the parent nor the child donates to charity. Interestingly, 27% of observations are characterised by the child reporting that they donate to charity, whilst the parent indicates that they do not donate to charity compared to only 15% where the parent reports that they donate to charity and the child reports that they do not donate to charity. The

[2] The definition of a charitable organization in the *PSID* includes 'religious or non-profit organizations that help those in need or that serve and support the public interest'. It is clearly stated in the questionnaire that the definition used does not include political contributions.

data also reveals that in the case where the parent talks to the child about donating to charity, 77% of children report that they donate to charity.

We model the donating behaviour of children via a system of three equations which capture the parent's decision to donate to charity (equation 1a below), whether the parent talks to the child about donating to charity (equation 1b below) and, finally, whether the child donates to charity (equation 1c below). Our focus lies in ascertaining the effects of the parent's donating behaviour and whether the parent talks to their child about donating on the probability that the child donates to charity. The key advantage of estimating a system of equations is that it allows us to account for the correlation via unobservable individual or household characteristics that may affect all three decisions. Thus, our system framework allows for the endogeneity of the parent's donating behaviour and whether the parent talks to the child. We specify a system of three latent equations as follows:

$$Y_1^* = \boldsymbol{X}_1'\beta_1 + \varepsilon_1; \tag{1a}$$

$$Y_2^* = \boldsymbol{X}_2'\beta_2 + \gamma_{21}Y_1 + \varepsilon_2; \tag{1b}$$

$$Y_3^* = \boldsymbol{X}_3'\beta_3 + \gamma_{31}Y_1 + \gamma_{32}Y_2 + \varepsilon_3. \tag{1c}$$

where Y_1^* and Y_3^* represent the propensity to donate by the parent and the child, respectively, and Y_2^*, the propensity of the parent to talk to their child about donating. Assume that the error terms in the three latent equations are independently and identically distributed and jointly follow a multivariate normal distribution with mean 0 and covariance matrix $\sum$. That is, $(\varepsilon_1, \varepsilon_2, \varepsilon_3)' \sim MVN[0, \sum]$ where the covariance matrix is given by

$$\sum = \begin{pmatrix} 1 & \rho_{12} & \rho_{13} \\ \rho_{12} & 1 & \rho_{23} \\ \rho_{13} & \rho_{23} & 1 \end{pmatrix},$$

ρ_{jk} being the correlation coefficient between ε_j and ε_k $(j,k=1,2,3; j \neq k)$ and Var(ε_1)= Var(ε_2)=Var(ε_3)=1 for identification purposes. Under this assumption, the set of equations given by (1a, b and c) above results in an endogenous Multivariate Probit (MVP) model with a recursive simultaneous structure. Identification is ensured through exclusion restrictions and a highly non-linear specification. For instance, $\boldsymbol{X}_1$ and $\boldsymbol{X}_2$ contain separate instruments that do not appear in $\boldsymbol{X}_3$. The MVP specification with potentially non-zero off-diagonal elements in $\sum$ allows for correlations across the disturbances of the three latent equations which embody unobserved characteristics. The system of equations allows for the estimation of several joint and conditional probabilities, such as, $\text{Prob}[Y_1=1, Y_2=1, Y_3=1]$, $\text{Prob}[Y_2=0 \mid Y_1=1]$ and $\text{Prob}[Y_3=1 \mid Y_1=1, Y_2=0]$.

We also estimate treatment effects of the endogenous variables, i.e. the impact of the parent donating to charity on whether he/she talks to the child about donating to charity, the impact of whether the parent donates on whether the child donates to charity and the impact of whether the parent talks to the child about donating to charity on whether the child donates to charity. Three widely used measures of treatment effects are ones that average over all individuals (*ATE*), ones that average over only the treated (*ATET*) and ones that average over only the untreated (*ATEUT*). For instance, the three measures of the treatment effects of Y_1 on $P(Y_2=1)$ can be obtained as follows:

$$ATE = E\left[Y_2^1 - Y_2^0; \boldsymbol{X}_2\right] = \Phi\left(\boldsymbol{X}_2'\beta_2 + \gamma_{21}\right) - \Phi\left(\boldsymbol{X}_2'\beta_2\right) \tag{2}$$

$$\begin{aligned} ATET &= E\left[Y_2^1 - Y_2^0 \mid Y_1=1, \boldsymbol{X}_1, \boldsymbol{X}_2\right] \\ &= \left\{\frac{\Phi_2\left(\boldsymbol{X}_1'\beta_1, \left(\boldsymbol{X}_2'\beta_2 + \gamma_{21}\right); \rho_{12}\right)}{\Phi\left(\boldsymbol{X}_1'\beta_1\right)}\right\} - \left\{\frac{\Phi_2\left(\boldsymbol{X}_1'\beta_1, \boldsymbol{X}_2'\beta_2; \rho_{12}\right)}{\Phi\left(\boldsymbol{X}_1'\beta_1\right)}\right\} \end{aligned} \tag{3}$$

$$ATEUT = E\left[Y_2^1 - Y_2^0 \mid Y_1 = 0, \boldsymbol{X}_1, \boldsymbol{X}_2\right]$$
$$= \left\{\frac{\Phi_2\left(-\boldsymbol{X}_1'\beta_1, \left(\boldsymbol{X}_2'\beta_2 + \gamma_{21}\right); -\rho_{12}\right)}{\Phi\left(-\boldsymbol{X}_1'\beta_1\right)}\right\} - \left\{\frac{\Phi_2\left(-\boldsymbol{X}_1'\beta_1, \boldsymbol{X}_2'\beta_2; -\rho_{12}\right)}{\Phi\left(-\boldsymbol{X}_1'\beta_1\right)}\right\} \quad (4)$$

where Y_2^1 and Y_2^0 denote the respective values of Y_2 when Y_1 takes values 1 and 0 and Φ and Φ_2 denote the univariate normal cumulative density function and the bivariate normal cumulative density function, respectively.

The computation of marginal effects in this model is fairly complex given the endogenous structure of the model and the presence of common variables across the three equations. We therefore estimate them via numerical derivatives of the multivariate normal distribution functions with respect to the exogenous variables. In addition, we can obtain marginal effects not only on marginal probabilities but also on joint and conditional probabilities. Consider, for example, $\boldsymbol{X}^*$, which appears in all three equations. If we were to compute the marginal effect of $\boldsymbol{X}^*$ on Y_3, this would comprise of a direct effect of $\boldsymbol{X}^*$ on $\text{Prob}\left[Y_3 = 1\right]$ and indirect effects through $\text{Prob}\left[Y_2 = 1\right]$ and $\text{Prob}\left[Y_1 = 1\right]$ given that Y_2 and Y_1 enter equation (3) (Greene, 2012). Standard errors of the estimated marginal effects and treatment effects are computed using the delta method.

In order to specifically explore the effects of parental religious donations, we repeat the analysis detailed above replacing whether the parent donates with whether the parent makes religious donations, which is defined as total donations to 'religious purposes or spiritual development'. 43% of households report that they make religious donations, with 34% of the matched observations characterised by the child donating and the parent making religious donations. Finally, we also estimate the model for parental donations to non religious causes, where 59% of parents report that they donate to such causes and 44% of the

matched observations are characterised by parents donating to non religious causes and children reporting that they donate to charity.

In terms of the explanatory variables in $\boldsymbol{X}_1$, we control for the following head of household characteristics: age, gender, ethnicity, years of schooling, an index of self-reported health status,[3] religious denomination and the number of hours volunteered by the head of household over the past year for unpaid work. We also control for household labour income, household non-labour income, household wealth and whether the home is owned, either outright or via a mortgage. Following the existing literature, we control for the price of donating to charity, which is determined by taxation as income donated to recognised charities in the U.S. is not subject to income tax. Hence, disposable income falls by less than the full amount donated: the price of the donation becomes the donation net of the saving in tax since each dollar donated to a recognised charity leads to less than one dollar sacrificed for consumption purposes (Auten et al., 2002). For households who itemise charitable donations in their tax return, the price of the donation is defined as one minus the household's marginal tax rate on the contribution made, whereas for households who do not itemise charitable donations, the price of the donation is one: donating one dollar means that there is one dollar less for consumption. Households who itemise are assigned the relevant tax rate using the National Bureau of Economic Research TAXSIM programme,[4] which calculates federal state tax liabilities for survey data based on a range of factors such as earnings, marital status and children.[5]

[3] The categories are as follows: 0=poor; 1=fair; 2=good; 3=very good; and 4=excellent.
[4] See http://www.nber.org/~taxsim/.
[5] One remaining issue, however, is that the decision to itemise is arguably not fully exogenous, i.e. the decision to itemise may be influenced by the level of donations. To account for this, as is common in the existing literature (see Auten et al, 2002), we exclude 'endogenous itemisers' who are defined as those who have itemised but would not have done so in the absence of their actual charitable donations. Due to an additional source of possible endogeneity relating to the price of a charitable donation being a function of both the donation and income, following Auten et al (2002), we calculate the price variable firstly by assuming that charitable donations equal zero (i.e. the first dollar price) and then after including a predicted amount of giving, set at 1% of average income. As stated by Auten et al (2002), p.376, 'this procedure yields a tax price consistent

In $\boldsymbol{X}_2$, in addition to the above head of household and household characteristics, we include controls for: whether the parent would like their child to complete a college degree; indexes of the frequency at which, in the last 12 months, the parent has discussed the following with their child: school activities or events of particular interest to the child; things the child has studied in class; the child's experiences of school;[6] finally, we control for whether the parent selects 'helping others when they need help' as the most important (out of a list of five options) for a child to learn, to prepare him or her for life.[7]

In terms of the explanatory variables in $\boldsymbol{X}_3$, we allow the following household characteristics to have a direct influence on whether the child donates, namely: household labour income, household non-labour income, household wealth and home ownership. The additional variables in $\boldsymbol{X}_1$ and $\boldsymbol{X}_2$ listed above indirectly influence whether the child donates via whether the parent donates and whether the parent talks to the child about donating, respectively. We also include in $\boldsymbol{X}_3$ a set of additional variables that have a direct influence on whether the child donates including the following characteristics of the child: gender; age; ethnicity; and self-assessed health, where health is defined as a categorical variable.[8] We control for the amount of the allowance/pocket money received by the child, the number of friends that the child has, whether the child is involved in any after-school sports or recreational programmes and whether the child was involved in any volunteer service activities or service clubs in the past 12 months. In order to control for other aspects of the child's behaviour, we control for whether the parent states that the child does each of the following, without adult encouragement, most days or everyday: helps siblings; is kind

---

with the actual costs of giving, but not endogenous to the individual donation decision.' Following the existing literature, we then take an average of the two price variables.

[6] The index is defined on a six-point scale: never (0); once or twice in the past 12 months (1); a few times in the past 12 months (3); about once a week (4); more than once a week (5); and every day (6).

[7] The other four options are: 'to obey'; 'to be well-liked or popular'; 'to think for himself or herself'; and 'to work hard'.

[8] The categories are as follows: 0=poor; 1=good; 3=very good; and 4=excellent.

towards siblings; cooperated with siblings; takes turns with play materials with siblings; or listens to siblings. We also control for: whether the child has given emotional support to their friends over the last 6 months; whether the child has helped friends with things they had to get done, such as homework or chores, a few times a week or more over the last six months; and whether the child has helped parents with things they had to get done, such as chores or running errands, a few times a week or more over the last six months.

Finally, we control for general aspects of the child's behaviour, as perceived by the parent, based on the parent's responses as to whether the following ten descriptions are 'not at all' like the child up to 'totally like' the child:[9] 'is cheerful, happy'; 'waits his/her turn in games and other activities'; 'does neat, careful work'; 'is curious and exploring, likes new experiences'; 'thinks before he/she acts, is not impulsive'; 'gets along well with other people his/her age'; 'usually does what you tell him/her to do'; 'can get over being upset quickly'; 'is admired and well-liked by other people his/her age'; and 'tries to do things for himself/herself, is self-reliant'. We use cronbach's alpha to create an aggregate measure of the child's behaviour and specify two binary dummy variables which represent the 'totally like' and 'like' categories. Summary statistics for all of the explanatory variables employed in our empirical analysis are presented in Table 1 in the appendix.

3. Results

The results from estimating the system of three equations are presented in Tables 2 to 4 in the appendix. In Table 2A, we present the *ATE*s, *ATET*s and *ATEUT*s for the endogenous variables of the model, namely whether the parent donates to charity and whether the parent talks to their child about donating to charity, based on parental total donations, whilst in Tables 2B and 2C we present the corresponding results for parental religious donations and non religious donations, respectively. It is apparent from Table 2A that the treatment effects

[9] The responses are based on a five-point ordinal scale.

of whether the parent donates to charity on whether the parent talks to their child about donating to charity are all positive, statistically significant and of a similar order of magnitude, approximately fifteen percentage points, indicating a relatively large positive effect. In the case of the treatment effects of whether the parent donates to charity on whether the child donates, the three effects are again positive and broadly similar, yet smaller in magnitude, at approximately six percentage points, as compared to the effect on whether the parent talks to the child about donating, as well as being on the borderline of statistical significance. In contrast, the *ATE*, *ATET* and *ATEUT* related to the effect of whether the parent talks to the child about donating on whether the child donates are all strongly statistically significant. The three estimated effects are all positive and relatively large, indicating a sizeable positive influence of the parent talking to the child about donating on whether the child donates to charity.

A similar pattern of results is presented in Table 2B relating to whether the parent donates to religious causes. It is apparent that the effects related to whether the parent makes religious donations are all greater in magnitude than in the case of whether the parent makes any donation irrespective of the cause. This is particularly apparent in the case of the effect of whether the parent donates to religious purposes on whether the child donates, where both the size and the statistical significance of the three effects are all considerably increased from around six percentage points in Table 2A to around fifteen percentage points in Table 2B. Positive and statistically significant treatment effects of approximately thirteen percentage points are also found relating to the effect of whether the parent talks about donating to the child on whether the child actually makes a donation. The findings presented in Table 2C mirror those presented in Table 2A given the considerable overlap between the binary indicators for parents donating regardless of cause and parents donating to non religious causes.

Overall, it is apparent that whether the parent donates to charity and whether the parent talks to the child about donating to charity both have positive influences on the probability that the child donates to charity. In the case of whether the parent makes any donation to charity, the role of parental donating behaviour on whether the child donates appears to operate mainly via its influence on whether the parent talks to the child about donating to charity. In addition, our findings highlight a positive effect of whether the parent talks to the child about donating on whether the child donates, suggesting that parents are able to influence this aspect of their offspring's behaviour and help to nurture the generosity and altruistic behaviour of their children. Interestingly, the effects of whether the parent donates to charity are particularly pronounced in the case of parental religious donations, especially in terms of the effect of whether the parent makes such donations on the probability that the child donates to charity with respect to both magnitude and statistical significance, indicating a particularly important intergenerational effect in the context of this type of donation.

Table 3A presents the marginal effects relating to the exogenous variables for the probability of whether the parent makes any donations as well as for the probability of whether the parent talks to the child about donating. In Table 3B, the associated direct and indirect marginal effects related to the probability that the child donates are presented. We comment briefly on the estimated marginal effects given that the focus of our analysis lies in the effects of the endogenous variables as reported in Tables 2A, 2B and 2C.[10]

It is apparent from Table 3A that head of household characteristics such as ethnicity, health and years of schooling all influence the probability that the parent donates to charity. Statistically significant positive effects are also apparent from household labour income, wealth and home ownership, signalling the importance of financial factors. The positive

[10] For brevity, we do not present the marginal effects related to parental religious and non religious donations, which are in line with those presented in Tables 3A and 3B in terms of sign, size and statistical significance. These additional results are available on request.

marginal effect relating to volunteering ties in with the notion that donating money and donating time to charitable causes are complementary activities. Noticeable positive direct effects on the probability that the parent talks to the child about donating are apparent relating to the frequency at which the parent has discussed school activities over the last 12 months, whether the parent would like their child to complete a college degree and whether the parent regards 'helping others when they need help' as particularly important for a child to learn in preparation for life. For example, whether the parent deems that it is important for the child to learn about 'helping others when they need help' is associated with an 8.3 percentage point higher probability of the parent talking to the child about donating. Indirect effects operating via the probability that the parent donates are found for household labour income, wealth and home ownership, once again highlighting the importance of economic and financial factors. Statistically significant indirect effects are also apparent relating to head of household characteristics such as ethnicity, education and health, as well as volunteering.

Turning to Table 3B, statistically significant positive direct effects on the probability that the child donates are apparent for positive evaluations of the child's general behaviour as well as for whether the child has provided emotional support to their friends. Similar direct effects are also found relating to the child's participation in volunteer service activities or service clubs and participation in sports or recreational programmes. Indirect effects on the probability that the child donates operating via the probability that the parent talks to their child about donating are found for the frequency at which the parent has discussed school activities over the last 12 months, whether the parent would like their child to complete a college degree and whether the parent regards 'helping others when they need help' as particularly important to prepare a child for life. The latter is associated with a 1.3 percentage point increase in the probability that the child donates. Finally, positive total effects on the probability that the child donates are found for the head of household's years of education as

well as for the number of hours volunteered by the head of household for unpaid work, whereas a negative total effect is found for non labour income.

In order to explore the robustness of our findings, we repeat the analysis replacing the binary indicator of whether the parent donates to charity, Y_1, with the natural logarithm of the amount that the parent donates to charity.[11] Equation (1a) in our multivariate framework is then estimated as a tobit model, with the natural logarithm of the amount of charitable donations as the dependent variable, given that donations to charity are truncated at zero, with equations (1b) and (1c) in the system framework estimated as probit specifications as before.[12] The data reveals that 40% of observations are characterised by zero donations for total donations.[13] The amount donated to charity is then included as a covariate in equations (1b) and (1c) replacing the binary indicator of whether the parent donates to charity.

The results are summarised in Tables 4A and 4B. Table 4A presents the estimated marginal effects associated with the amount donated to charity for all donations (Panel A), the amount donated to religious causes (Panel B) and the amount donated to non religious causes (Panel C), whilst Table 4B presents the treatment effects related to the effects of whether the parent talks to the child about donating on the probability that the child donates for all parental donations (Panel A), parental religious donations (Panel B) and parental non religious donations (Panel C). It is apparent from Table 4A Panel A that the amount donated to charity, irrespective of cause, has a positive and highly statistically significant influence on the probability that the parent talks to the child about donating. For example, regardless of the type of parental donation a one percent increase in the level of the donation is associated with around a 2.6 higher probability of the parent talking to the child about donating. Positive direct and indirect influences from the amount that the parent donates to charity are also

[11] We add one to the series of charitable donations to deal with the logarithmic transformation.
[12] The error terms in the three equations are again assumed to jointly follow a multivariate normal distribution. The system of equations is estimated using the conditional recursive mixed process estimator (Roodman, 2007).
[13] The means (standard deviations) of the natural logarithm of total donations, religious donations and non religious donations, deflated using 2007 prices, are 4.49 (3.86), 2.80 (3.37) and 4.14 (3.71), respectively.

found on the probability that the child donates to charity. The results presented in Panels B and C, which are related to the amount donated to religious causes and non religious causes, respectively, mirror those in Panel A, with those presented in Panel B all being larger in magnitude relative to those in Panels A and C.

It is apparent from Table 4B that the treatment effects associated with the influence of the parent talking to the child about donating on the probability that the child donates to charity are all positive as in Tables 2A, 2B and 2C for total parental donations (Panel A), parental religious donations (Panel B) and parental non religious donations (Panel C). It is noticeable that the sizes of the effects have increased relative to those presented in Tables 2A, 2B and 2C, with increases of around 15% to 17-18% for all donations and donations to non religious causes and from 13% to around 14% for religious donations. Our findings thus accord with those related to the endogenous multivariate probit framework with the probability that the child donates to charity being positively influenced by the amount that the parent donates to charity and whether the parent talks to their child about donating to charity.

4. Conclusion

In this paper we have contributed to the empirical literature on the analysis of charitable donations by exploring the relationship between the donating behaviour of parents and their offspring aged less than 18, i.e. pre-adulthood. The lack of existing literature in this area, which may reflect a shortage of data, is in stark contrast to the growing interest in intergenerational relationships in other areas of economics such as the link between the human capital, income and wealth of parents and their children.

Our findings suggest that whether the parent donates to charity and whether the parent talks to the child about donating to charity both have positive influences on the probability that the child donates to charity. In the case of whether the parent donates to charity, the role of parental donating behaviour on whether the child donates appears to operate via its

influence on whether the parent talks to the child about donating to charity. In addition, our finding of a positive effect of whether the parent talks to the child about donating on whether the child donates suggests that parents are able to influence this aspect of their offsprings' behaviour and help to nurture the generosity and altruistic behaviour of their children. Interestingly, the effects of whether the parent donates to charity are particularly pronounced in the case of parental religious donations, especially in terms of the effect of whether the parent makes such donations on whether the child donates to charity with respect to both magnitude and statistical significance, indicating a particularly important intergenerational effect in the context of this type of donation.

Philanthropic behaviour has already attracted considerable attention in the economics literature yet to date little is known about the intergenerational relationship between the donating behaviour of parents and their offspring. Our empirical findings have served to shed some light on how parents influence the donating behaviour of their children and hopefully will serve to stimulate further interest in this research area.

References

Andreoni, J. (2006) Philanthropy. In The Handbook of the economics of giving, altruism and reciprocity, volume 2, edited by S. C. Kolm and J. M. Ythier, Elsevier.

Auten, G. E., Sieg, H. and Clotfelter, C. T. (2002) Charitable giving, income, and taxes: an analysis of panel data. *American Economic Review*, 92, 371-82.

Blanden, J., Gregg, P. and Macmillan, L. (2007) Accounting for intergenerational income persistence: noncognitive skills, ability and education. *Economic Journal*, 117, pp. C43-C60.

Charles, K. and Hurst, E. (2003) The correlation of wealth across generations. *Journal of Political Economy*, 111, 1155-1182.

Cunha, F. And Heckman, J. (2007) The technology of skill formation. *American Economic Review*, 97, 31-47.

Dohmen, T., A. Falk, D. Huffman and Sunde, U. (2007) The intergenerational transmission of risk and trust attitudes. IZA Discussion Paper Number 2380.

Glenday, G., Gupta, A. K. and Pawlak, H. (1986) Tax incentives for personal charitable donations. *Review of Economics and Statistics*, 68, 688-93.

Greene, W. (2012) Econometric analysis. International Edition, 7th Edition, Prentice Hall.

Grusec, J. E. (1991) The socialization of altruism. In Prosocial behavior, edited by Clark, M. S., Sage Publications.

Guiso, L., P. Sapienza and Zingales, L. (2008) Social capital as good culture. *Journal of the European Economic Association*, 6, 295-320.

Okumura, T. and Usui, E. (2010) Do parents' social skills influence their children's sociability? IZA Discussion Paper Series Number 5324.

Roodman, D. (2009) Estimating fully observed recursive mixed-process models with cmp, Working Papers 168, Center for Global Development.

Schokkaert, E. (2006) Empirical analysis of transfer motives. In The handbook of the economics of giving, altruism and reciprocity, volume 1, edited by S. C. Kolm and J. M. Ythier, Elsevier.

Solon, G. (1999) Intergenerational mobility in the labor market. In The handbook of labor economics, volume 3, edited by O. Ashenfelter and D. Card, Elsevier.

Wilhelm, M. O., E. Brown, P. M. Rooney and Steinberg, R. (2008) The intergenerational transmission of generosity. *Journal of Public Economics*, 92, 2146-56.

TABLE 1: Summary statistics and variable definitions

	DEFINITION	MEAN	*SD.*
Age	Age of parent (head or spouse): 16 to 81	40.46	*7.56*
Age squared	Age of parent squared	1,693.90	*638.49*
Male	Gender of parent: 1=male, 0=female	0.69	*0.46*
White	Ethnicity of parent: 1=white, 0=non white	0.45	*0.49*
Years of schooling	Schooling of parent: 8 (8^{th} grade or below) to 17 (post graduate)	12.69	*2.45*
Health[1]	Health of parent: 0=poor,...,4=excellent	2.66	*1.01*
Log labour income[2]	Natural logarithm of annual labour income of husband & wife	9.73	*2.83*
Log non labour income[2]	Natural logarithm of annual transfer income husband & wife	3.49	*4.13*
Log wealth[2]	Natural logarithm of annual stocks/shares, checking/savings	5.22	*4.03*
Own home	Housing tenure: 1=owned outright/or mortgage, 0=other	0.63	*0.48*
Catholic	Family religious denomination: 1=catholic, 0=other	0.22	*0.42*
Protestant	Family religious denomination: 1=protestant, 0=other	0.65	*0.48*
Other religion	Family religious denomination: 1=other religion, 0=other	0.06	*0.24*
Number of hours volunteer	Unpaid hours parent(s) volunteered over past year 0-3,650	65.75	*201.73*
Price	One minus the tax rate	0.83	*0.12*
Discuss school activities[3]	Last year discussed school activities: 0=never, 5=daily	3.65	*1.41*
Discuss school experience[3]	Last year discussed school experience: 0=never, 5=daily	4.19	*1.18*
Discuss studies[3]	Last year discussed class studies: 0=never, 5=daily	4.08	*1.22*
Important to help others	Most important for child to learn to help others: 1=yes, 0=no	0.08	*0.28*
Want child to get degree	Would like child to get degree: 1=yes, 0=no	0.88	*0.32*
Male child	Gender of child: 1=male, 0=female	0.51	*0.50*
White child	Ethnicity of child: 1=white, 0=non white	0.23	*0.42*
Age of child	Age of child 8 to 17	13.26	*2.56*
Age of child squared	Age of child squared	182.32	*66.50*
Health of child[4]	Health of child (defined by primary care giver): 0=poor,...3=excellent	2.34	*0.81*
Child behaviour 1[5]	Parent thinks it is like their child to be: 1=yes, 0=no	0.53	*0.50*
Child behaviour 2[5]	Parent thinks is it totally like their child to be: 1=yes, 0=no	0.35	*0.48*
Log child allowance[2]	Natural logarithm of child's weekly allowance	1.34	*1.71*
Cooperate with siblings[6]	Cooperates with siblings most /every day: 1=yes, 0=no	0.52	*0.50*
Help siblings[6]	Helps siblings most/every day: 1=yes, 0=no	0.41	*0.49*
Kind to siblings[6]	Considerate to siblings most /every day: 1=yes, 0=no	0.56	*0.50*
Listen to siblings[6]	Listens to siblings most/every day: 1=yes, 0=no	0.49	*0.50*
Play with siblings[6]	Take turn to play with materials with siblings most/every day: 1=yes, 0=no	0.45	*0.50*
Emotional support[7]	Given emotional support to friends few times a week or more: 1=yes, 0=no	0.44	*0.50*
Help friends[7]	Help friends few times a week or more: 1=yes, 0=no	0.25	*0.43*
Number of friends	Number of friends child has: 0,...,4+	2.63	*1.21*
Helps parents	Help parents few times a week or more (6 months): 1=yes, 0=no	0.57	*0.49*
Child volunteers	Child volunteered during past 12 months: 1=yes, 0=no	0.32	*0.46*
Child sports programme	Spent time on sport/recreation last summer: 1=yes, 0=no	0.48	*0.49*
OBSERVATIONS	3,130		

Notes: [1]Parent health outcomes 0=poor, 1=fair, 2=good, 3=very good, 4=excellent. [2]All monetary variables are given in 2007 prices. [3]Frequency parent discusses school issues with child during past year 0=never, 1=once or twice, 2=a few times, 3=about once a week, 4=more than once a week, 5=daily. [4]Child health outcomes 0=poor, 1=good, 2=very good, 3=excellent. [5]Child's personality: happy/take turn/neat/curious/not impulsive/get along with other kids\obedient\gets over getting upset quickly\well liked\self-reliant. [6]Child's interaction with siblings during past month without any adult encouragement. [7]During the past 6 months.

TABLE 2A: ATEs, ATETs and ATEUTs: All Donations

	ATE	*T STAT*	ATET	*T STAT*	ATEUT	*T STAT*
	E[Y2(1)-Y2(0)]		*E[Y2(1)-Y2(0)|Y1=1]*		*E[Y2(1)-Y2(0)|Y1=0]*	
Parent donates to charity	0.152	*3.45*	0.153	*3.25*	0.151	*3.87*
	E[Y3(1)-Y3(0)]		*E[Y3(1)-Y3(0)|Y1=1]*		*E[Y3(1)-Y3(0)|Y1=0]*	
Parent donates to charity	0.061	*1.53*	0.062	*1.48*	0.060	*1.62*
	E[Y3(1)-Y3(0)]		*E[Y3(1)-Y3(0)|Y2=1]*		*E[Y3(1)-Y3(0)|Y2=0]*	
Parent talks to child about donating	0.154	*3.42*	0.155	*3.23*	0.149	*3.92*

TABLE 2B: ATEs, ATETs and ATEUTs: Religious donations

	ATE	*T STAT*	ATET	*T STAT*	ATEUT	*T STAT*
	E[Y2(1)-Y2(0)]		*E[Y2(1)-Y2(0)|Y1=1]*		*E[Y2(1)-Y2(0)|Y1=0]*	
Parent donates to religious charity	0.199	*4.85*	0.203	*4.14*	0.196	*5.60*
	E[Y3(1)-Y3(0)]		*E[Y3(1)-Y3(0)|Y1=1]*		*E[Y3(1)-Y3(0)|Y1=0]*	
Parent donates to religious charity	0.147	*3.80*	0.157	*3.34*	0.140	*4.24*
	E[Y3(1)-Y3(0)]		*E[Y3(1)-Y3(0)|Y2=1]*		*E[Y3(1)-Y3(0)|Y2=0]*	
Parent talks to child about donating	0.133	*3.02*	0.132	*2.87*	0.134	*3.44*

TABLE 2C: ATEs, ATETs and ATEUTs: Non religious donations

	ATE	*T STAT*	ATET	*T STAT*	ATEUT	*T STAT*
	E[Y2(1)-Y2(0)]		*E[Y2(1)-Y2(0)|Y1=1]*		*E[Y2(1)-Y2(0)|Y1=0]*	
Parent donates to non religious charity	0.132	*2.99*	0.132	*2.82*	0.132	*3.30*
	E[Y3(1)-Y3(0)]		*E[Y3(1)-Y3(0)|Y1=1]*		*E[Y3(1)-Y3(0)|Y1=0]*	
Parent donates to non religious charity	0.055	*1.43*	0.056	*1.40*	0.054	*1.50*
	E[Y3(1)-Y3(0)]		*E[Y3(1)-Y3(0)|Y2=1]*		*E[Y3(1)-Y3(0)|Y2=0]*	
Parent talks to child about donating	0.158	*3.50*	0.160	*3.32*	0.151	*4.07*

TABLE 3A: Marginal Effects: Probability (parent donates = 1) and Probability (parent talks to the child about donating = 1): All Donations

	Prob. (parent donates=1)		**Prob. (parent talks to child about donating=1)**					
			Direct effect		Indirect effect from parent donates		Total effect	
	M.E.	*T STAT*	M.E.	*TSTAT*	M.E.	*TSTAT*	M.E.	*TSTAT*
Age	0.0173	*1.73*	0.0033	*0.40*	0.0028	*1.52*	0.0060	*0.73*
Age squared	-0.0001	*0.86*	-0.0003	*0.35*	-0.0002	*0.82*	-0.0005	*0.52*
Male	0.0365	*1.36*	0.0230	*0.99*	0.0058	*1.26*	0.0288	*1.21*
White	0.0950	*3.69*	-0.1565	*6.79*	0.0151	*2.59*	-0.1414	*6.09*
Years of schooling	0.0430	*8.90*	0.0075	*1.78*	0.0068	*3.29*	0.0143	*3.46*
Health	0.0247	*2.34*	0.0044	*0.50*	0.0039	*2.02*	0.0083	*0.93*
Log labour income	0.0124	*2.98*	-0.0030	*0.87*	0.0020	*2.32*	-0.0010	*0.29*
Log non labour income	0.0025	*1.00*	0.0012	*0.55*	0.0004	*0.96*	0.0016	*0.72*
Log wealth	0.0342	*11.74*	0.0001	*0.02*	0.0054	*3.36*	0.0055	*2.04*
Own home	0.1428	*5.99*	0.0488	*2.28*	0.0227	*3.04*	0.0715	*3.39*
Catholic	-0.0313	*0.65*	-0.0387	*1.06*	-0.0050	*0.63*	-0.0437	*1.17*
Protestant	0.0023	*0.05*	-0.0106	*0.32*	-0.0004	*0.05*	-0.0110	*0.30*
Other religion	0.0512	*0.87*	0.0037	*0.08*	0.0081	*0.76*	0.0118	*0.25*
Number of hours volunteered	0.0002	*3.11*	0.0005	*1.31*	0.0004	*2.31*	0.0009	*2.19*
Price	0.0073	0.09	–		0.0012	*0.09*	0.0012	*0.09*
Discuss school activities	–		0.0278	*3.75*	–		0.0278	*3.75*
Discuss school experience	–		0.0033	*0.31*	–		0.0033	*0.31*
Discuss studies	–		0.0133	*1.29*	–		0.0133	*1.29*
Important to help others	–		0.0837	*2.71*	–		0.0837	*2.71*
Want child to get degree	–		0.0774	*2.88*	–		0.0774	*2.88*
Probability of event; p value	0.6414; *p=[0.000]*		0.7183; *p=[0.000]*					
Chi Squared (159); p value			1,314.87; *p=[0.000]*					
OBSERVATIONS			3,130					

TABLE 3B: Marginal Effects: Probability (child donates = 1): All Donations

	Prob. (child donates=1)							
	Direct effect		Indirect effect from parent donating		Indirect effect from talking to child		Total effect	
	M.E.	*T STAT*	M.E.	*T STAT*	M.E.	*T STAT*	M.E.	*T STAT*
Age	–		0.0015	*1.38*	0.0005	*0.40*	0.0020	*1.23*
Age squared	–		0.0001	*0.81*	0.0001	*0.35*	0.0002	*0.79*
Male	–		0.0032	*1.11*	0.0036	*0.96*	0.0068	*1.40*
White	–		0.0084	*1.86*	-0.0245	*3.10*	-0.0161	*1.77*
Years of schooling	–		0.0038	*2.14*	0.0012	*1.59*	0.0050	*2.64*
Health	–		0.0022	*1.65*	0.0007	*0.49*	0.0029	*1.45*
Log labour income	-0.0043	*1.33*	0.0011	*1.81*	-0.0005	*0.85*	-0.0037	*1.13*
Log non labour income	-0.0054	*2.74*	0.0002	*0.88*	0.0002	*0.54*	-0.0050	*2.53*
Log wealth	-0.0020	*0.67*	0.0030	*2.16*	0.0001	*0.02*	0.0011	*0.46*
Own home	-0.0076	*0.38*	0.0127	*2.10*	0.0077	*1.95*	0.0128	*0.66*
Catholic	–		-0.0028	*0.61*	-0.0061	*1.03*	-0.0089	*1.20*
Protestant	–		0.0002	*0.05*	-0.0017	*0.32*	-0.0015	*0.22*
Other religion	–		0.0045	*0.52*	0.0006	*0.07*	0.0051	*0.42*
Number of hours volunteer	–		0.0002	*1.82*	0.0001	*0.97*	0.0003	*2.26*
Price			0.0006	*0.09*	–		0.0006	*0.09*
Discuss school activities	–		–		0.0044	*2.70*	0.0044	*2.70*
Discuss school experience	–		–		0.0005	*0.31*	0.0005	*0.31*
Discuss studies	–		–		0.0021	*1.24*	0.0021	*1.24*
Important to help others	–		–		0.0131	*2.11*	0.0131	*2.11*
Want child to get degree	–		–		0.0121	*2.14*	0.0121	*2.11*
Male child	-0.0307	*1.78*	–		–		-0.0307	*1.78*
White child	-0.0242	*1.08*	–		–		-0.0242	*1.08*
Age of child	-0.0269	*0.83*	–		–		-0.0269	*0.83*
Age of child squared	0.0012	*0.94*	–		–		0.0012	*0.94*
Health of child	-0.0124	*1.18*	–		–		-0.0124	*1.18*
Child behaviour 1	0.0539	*2.16*	–		–		0.0539	*2.16*
Child behaviour 2	0.0502	*1.82*	–		–		0.0502	*1.82*
Log child allowance	-0.0017	*0.34*	–		–		-0.0017	*0.34*
Cooperate with siblings	-0.0181	*0.75*	–		–		-0.0181	*0.75*
Help siblings	-0.0038	*0.19*	–		–		-0.0038	*0.19*
Kind to siblings	0.0396	*1.67*	–		–		0.0396	*1.67*
Listen to siblings	-0.0160	*0.75*	–		–		-0.0160	*0.75*
Play with siblings	0.0214	*1.01*	–		–		0.0214	*1.01*
Emotional support	0.0505	*2.61*	–		–		0.0505	*2.61*
Help friends	0.0324	*1.52*	–		–		0.0324	*1.52*
Number of friends	0.0077	*1.09*	–		–		0.0077	*1.09*
Helps parents	0.0223	*1.21*	–		–		0.0223	*1.21*
Child volunteers	0.1222	*6.25*	–		–		0.1222	*6.25*
Child sports programme	0.0565	*3.36*	–		–		0.0565	*3.36*
Probability of event; p value	0.7422; *p=[0.000]*							
Chi Squared (159); p value	1,314.87; *p=[0.000]*							
OBSERVATIONS	3,130							

TABLE 4A: Marginal Effects: The Amount of Parental Donations

	Prob. (parent talks to child about donating=1)		**Prob. (child donates=1)**					
PANEL A: All Donations	Direct effect		Direct effect		Indirect effect from talking to child		Total effect	
	M.E.	*T STAT*	M.E.	*T STAT*	M.E.	*T STAT*	M.E.	*T STAT*
Log (donations)	0.0263	*9.67*	0.0076	*2.36*	0.0045	*2.39*	0.0122	*4.76*
PANEL B: Religious Donations	**Prob. (parent talks to child about donating=1)**		**Prob. (child donates=1)**					
	Direct effect		Direct effect		Indirect effect from talking to child		Total effect	
	M.E.	*T STAT*	M.E.	*T STAT*	M.E.	*T STAT*	M.E.	*T STAT*
Log (donations to religious causes)	0.0331	*11.29*	0.0168	*4.73*	0.0047	*2.01*	0.0215	*7.92*
PANEL C: Non Religious Donations	**Prob. (parent talks to child about donating=1)**		**Prob. (child donates=1)**					
	Direct effect		Direct effect		Indirect effect from talking to child		Total effect	
	M.E.	*T STAT*	M.E.	*T STAT*	M.E.	*T STAT*	M.E.	*T STAT*
Log (donations to non religious causes)	0.0252	*8.66*	0.0066	*2.02*	0.0047	*2.54*	0.0113	*4.20*
OBSERVATIONS	3,130							

TABLE 4B: ATEs, ATETs and ATEUTs: The Amount of Parental Donations

	ATE	*T STAT*	ATET	*T STAT*	ATEUT	*T STAT*
PANEL A: All Donations						
	E[Y3(1)-Y3(0)]		*E[Y3(1)-Y3(0)|Y2=1]*		*E[Y3(1)-Y3(0)|Y2=0]*	
Parent talks to child about donating	0.171	*2.48*	0.175	*2.46*	0.159	*2.45*
PANEL B: Religious Donations						
	E[Y3(1)-Y3(0)]		*E[Y3(1)-Y3(0)|Y2=1]*		*E[Y3(1)-Y3(0)|Y2=0]*	
Parent talks to child about donating	0.138	*2.02*	0.140	*2.01*	0.131	*2.02*
PANEL C: Non Religious Donations						
	E[Y3(1)-Y3(0)]		*E[Y3(1)-Y3(0)|Y2=1]*		*E[Y3(1)-Y3(0)|Y2=0]*	
Parent talks to child about donating	0.184	*2.68*	0.189	*2.68*	0.169	*2.64*