Donations for overseas development: evidence from a panel of UK charities

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Abstract

We model the determinants of donations made to UK overseas development charities using panel data on charities' donation income covering a 25 year period. The paper starts by reviewing relevant theory and previous empirical work on donations to UK charities before outlining a framework in which donations are a function of fundraising, government grants, total household income, inequality in household income, disasters, Official Development Assistance, and unobserved fixed characteristics of charities. Models are estimated by the within groups estimator and also by Generalised Method of Moments (GMM). When using the GMM approach, fundraising and government grants are allowed to be endogenous. Fundraising has a powerful effect. Government grants appear to crowd in rather than crowd out donations. No impact is found from ODA. The hypothesis of a unitary income elasticity for donations cannot be rejected. Results are compared with those for non-development charities.

Keywords: charitable donations, overseas development, panel data.

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1. Introduction

Charitable donations to UK charities working for overseas development have grown enormously over the last 30 years. From 1978 to 2004, total contributions to development charities among the top 200 fundraising charities increased almost seven-fold in real terms, and donations grew more quickly than to other charitable causes (Atkinson et al 2008). By the end of the period these larger charities focusing on overseas development and emergency relief received nearly £1 billion in donations and bequests, equal to about a quarter of the figure for the UK Government's Official Development Assistance (ODA) at that time.

What are the determinants of this trend? The existing empirical literature on the determinants of changes in charitable giving in the UK is small and provides only partial answers. The works by Khanna, Posnett and Sandler (1995) [KPS henceforth] and Khanna and Sandler (2000) [KS] are closest to our own in that they use the same source of data as we do in this paper – information on the voluntary donated income of charities from the annual publication *Charity Trends* of the Charities Aid Foundation (CAF). The authors estimate models for the determinants of donations to four broad causes, including 'overseas'. They concentrate on the impacts of charities' fundraising expenditures and the grants that they receive from the government – seeking thereby to shed light on charities' revenue strategies on the one hand and on the extent of crowding out of donations on the other. However, KPS and KS do not consider the impact of changes in the underlying macroeconomy on charitable donations (their data cover only 8 years), something that the onset of the current recession has generated considerable interest in (eg NCVO, 2009). Nor do they estimate the extent of any crowding out of overseas donations by the the UK government's provision of Official Development Assistance (ODA). By contrast, Banks and Tanner (1995), using another source (data pooled from 23 years of the Family Expenditure Survey), have estimated the income elasticity of charitable giving in the UK, but their data did not distinguish different causes.

In this paper we extend the existing literature in several ways. First, our focus on giving for overseas development rather on a range of different causes allows us to give more consideration to the particular characteristics of giving to this cause – although we also model trends in giving to other causes to see if development really is different. In specifying an appropriate model we draw in part on new theory on giving

for development that has produced as part of the same project (Atkinson 2008). We look at the impact both of macroeconomic change as reflected in changing household incomes and at the 'charity level' variables that were the focus of KPS and KS. We also consider the UK government's spending on ODA, which stagnated in the 1980s and most of the 1990s but has grown hugely since the late 1990s, and the impact of disasters – a key feature in giving to international charities – of which the Ethiopian famine of the early 1980s and the Asian Tsunami 20 years later are the most prominent examples. Like KPS and KS, we construct a panel of charities from the annual CAF reports although we use data from a substantially longer period, 27 years rather 8 years.[1]

Section 2 reviews the relevant literature in more detail, including that mentioned above, and outlines our framework for modelling charitable giving for overseas development. Section 3 describes our data. Section 4 explains our econometric specification. Section 5 presents results. Section 6 concludes.

2. Modelling charitable giving for development

Models of giving

We wish to explain the donations received by development charities and to compare their determinants with donations to charities serving other causes. In doing so, we need to recognise that a charity's donations reflect both supply and demand: the impact of individuals' behaviour in giving and the charity's own efforts to collect money. This is underlined by the importance of what charity fundraisers call 'the ask': 'fund-raisers know that to get money donated, you have to ask for it' (Andreoni 2006). Unfortunately, as Andreoni goes on to emphasise 'the interaction between supply and demand for philanthropy has been largely neglected in both theoretical and empirical analysis'. Our empirical model contains elements suggested from work on both sides of the market.

On the supply side, there is a rich body of theory on charitable giving, based on the assumption that individuals derive utility either from the benefit it brings the object of the charity (i.e. the ultimate recipient) or from the act of giving itself. These

[1] A companion paper describes the construction of the panel and the trends in the data (Atkinson et al 2008).

are the public goods and 'warm-glow' motives. In general, models based on these approaches have not focused on any particular charitable cause. In this sense, giving has tended to be treated as a homogenous good. But in general people are not indifferent as to where their donation ends up – they think to give to a specific cause. In the case of overseas development, Atkinson (2008) argues that neither the public good model nor the warm-glow model succeed in capturing key aspects of the giving decision, including donor motivation and the ways that charities approach fundraising. He proposes a new 'identification' model that incorporates elements of both the existing approaches.

In Atkinson's model, individuals giving money to a development charity 'identify' with the ultimate recipients on a one-to-one or one-to-*m* basis, where *m* is a small number, e.g. the marginal poor family or village that the charity can extend help to with the individual's donation. Their wellbeing enters the donor's utility function, reflecting the notion that giving for development does arise from a concern for others and is not merely motivated by warm glow. But unlike in the pure public goods model, the donor's utility is not assumed to be affected by the well-being of <u>all</u> persons receiving help from the charity. Hence the standard problem of that model – that individuals will free ride on the donations of others – does not arise. The 'identification' model can therefore explain why people do contribute to large development charities. And it underlines why giving to different causes may be determined in different ways.

Donations are a function of donor income, reflecting in particular the warm glow approach, and, reflecting the public good approach, of leakages – the notion that not all of the amount given by the donor reaches the recipient. As Atkinson points out, the threat of leakage through corruption and misgovernment features prominently in debate about overseas aid.[2] Donor perceptions of need play a key role and these may be affected by both charity and government action. Government ODA affects need directly in the model: unlike other people's donations, it is assumed to influence the living standards of the recipients with whom the donor identifies – providing a possible source of crowding out. In this case ODA reduces perceived need. But government action, including ODA flows, may also raise the perception of need by drawing attention to problems of developing countries. Atkinson's model provides a

[2] For example, see the qualitative research carried out as part of our ESRC-funded project that is reported in Atkinson and Eastwood (2007).

framework for interpreting charities' actions: charities may increase the awareness of need through their fund-raising campaigns, but very high expenditure on fundraising may be seen by donors as excessive. It may therefore be seen as evidence of leakage .[3]

These two impacts of charity fundraising – one positive and one negative – have been analysed in the (smaller) literature that focuses on the demand side: the charities' behaviour e.g. Rose-Ackerman (1982) and Weisbrod and Dominguez (1986). Several papers have estimated empirical models of donations received by charities. Three UK studies are particularly relevant to our research. Posnett and Sandler (1989), KPS and KS all use the same source as us, data from the CAF publication *Charity Trends* (and its forerunners), and consider the impact of both fundraising and government grants. The empirical specification in the three papers is quite similar as the authors look to identify the objective function of fundraisers, any crowding out by government grants to the charities, and the impact of charities' alternative sources of income (e.g. bequests) which are also seen as potentially crowding out donations. In addition to estimating these effects for donations to all causes, all three papers estimate separate models for charities grouped under four headings of charitable cause: health, religion, social welfare, and overseas. In this they go against the run of the empirical literature on the supply side, which like the theoretical literature has tended not to distinguish the different charitable causes to which individuals give.[4]

Fundraising is allowed to have a direct impact on the donations received by a charity, hypothesized to be positive. But, following Rose-Ackerman (1982) and Weisbrod and Dominguez (1986), fundraising is assumed also to affect the 'price' of donations, which is a measure of the cost to a donor of increasing the charitable output of a charity by £1. This is specified as $(1 - t)/(1 - f - a)$ where t is marginal rate of tax faced by the individual and f and a are the proportions of total expenditure spent by the charity on fundraising and administration respectively. Both fundraising and administration are seen here as leakages, increasing the price of giving and hence hypothesized to reduce giving. All three papers ignore t in practice. Prior to 2000, tax

[3] Fundraising expenditure may also help to set m in the model, as in the case of 'adopt a child' programmes.

[4] Exceptions from the US include Feldstein (1975), Reece (1979), Schiff (1985), and Andreoni et al (1996). But as far as we are aware, the US studies have not separately identified giving for overseas development (other than Ribar and Wilhelm (1995), who look only at overseas giving).

deductions for charitable donations in the UK required giving through one's employer via a payroll deduction or agreeing to covenant income to a charity for several years.

Government grants to charities may crowd out their donations or may 'crowd in' more giving – they may be viewed by donors as a signal that a charity is worth supporting. In the case of the overseas development charities, these grants represented a total of about £250m in 2004-5, compared to donations of about £1bn (Atkinson et al 2008, charities among the top 200 in the CAF reports). Over the period we consider, they grew even more than donations – by a factor of 10 between the late 1970s and the mid-1990s, when there was a levelling off. In general, these grants are to fund programme work in developing countries, and therefore they are included in the UK government's ODA expenditure, although they constitute only a small part of the total (about 5 per cent in 2004). ODA is not included in the models for overseas donations in the KPS and KS papers, nor other variables motivated by consideration of the particular characteristics of any of the causes. (Much of the focus is on the modelling of donations to all causes taken together.)

Based on the above discussions, the general form of the models can be written as donations being a function of fundraising expenditure, price of giving, government grant receipts, other income receipts and the age of the charity. In summarising the existing results, we focus on the impacts of fundraising expenditure, price and government grants.

Posnett and Sandler use OLS on a cross section of 299 charities from *Charity Trends 1986/87*, the data typically referring to the 1985/86 accounting year. (At this time *Charity Trends* covered the top 300 fundraising charities and we return in Section 3 to the issue of the charity excluded from the analysis, Band Aid Trust.) All variables except age were entered in logs. Overseas was the smallest of the sub-samples, with 36 charities. The authors conclude that results are fairly similar for each of the four causes analysed 'with the notable exception of charities operating overseas, where autonomous income [other income] is the only significant variable' (1989: 196): fundraising, price and government grants are all insignificant in the model for overseas charities. For all three other causes, fundraising has a significant positive direct impact on donations and a significant negative impact via the price variable. For no cause is there evidence of significant crowding out by government grants (for overseas, the estimated parameter is -0.065, $t = -1.6$).

KPS and KS both use the CAF data to construct a balanced panel of 159 charities for the eight years 1983-90. This has two advantages. First, there are substantially more data than in a single cross-section, although for fewer charities – the overseas sub-sample had 20 charities. Second, unobservable charity effects can be allowed for in estimation, picking up reputation or donor loyalty for example. KPS address the potential endogeneity of fundraising expenditure, autonomous income, government grants and price with the 'quick fix' (KS: 1547) of replacing current values with the one period lag of these regressors. Their preferred approach is within-group estimation. Models are estimated in levels rather than with the log specification used by Posnett and Sandler. Nominal variables are deflated using the GDP deflator. Results for the whole sample (taking all charities together) are largely consistent with those obtained by Posnett and Sandler, at least with respect to the signs of the estimated effects. There is mild crowding in by government grants (i.e. a positive effect). Fundraising's direct effect is again positive and the impact of price is again negative. And, once more, overseas charities differ from other types of charity with both price and government grants having an insignificant impact (t-statistics of -1.2 and -0.4 respectively). However, the direct impact of fundraising is now significant for overseas charities (t = 3.0). Evaluating at the means (given the linear specification of the model), the total elasticity of donations with respect to fundraising (allowing for the impact also through the price variable) is estimated to be 0.23 for overseas charities. (This compares with 0.489 for social welfare, 0.221 for health, and 0.02 for religion.)

KS take the modelling a step forward by using instrumental variable (IV) methods. The motivation is the possible endogeneity of government grants – the notion that grants may be correlated with positive shocks to donations. For this variable, the IV methods are intended to overcome the 'quick fix' in the earlier paper of using single-period lagged values, treated as exogenous. Use of IV allows donations to be modelled as a function of current period government grants (the authors argue that fundraising campaigns emphasise current levels of government support). The instruments for government grants include 'macroeconomic' variables that do not vary with the charity: total central government grants to charities and the central government deficit as a proportion of GDP. The other variables that had previously been entered as single-period lags are now also entered in current values, and treated as exogenous – fundraising, price, and other income.

Exogeneity of government grants is rejected by the data in models for all charities taken together. Allowing for endogeneity, the positive impact of grants, i.e. crowding in, becomes much larger (a finding reflected in the title of the paper).

A varied picture is obtained when the model is estimated separately for each of the four causes. (As in the earlier papers, the switch from using the full sample to four sub-samples is accompanied by a reduction in the precision of estimates in line with the smaller sample sizes.) Government grants have no impact at all for overseas charities (t = -0.01), and the positive impacts for the other causes are significant (at the 5 percent level) only for social welfare charities. For overseas donations, this result is consistent with the findings of the earlier two papers. Again consistent with KPS (although not Posnett and Sandler), fundraising (now current rather than lagged as in KPS) has a positive impact for overseas giving (t = 3.4) and the total elasticity is very similar at sample mean values to that found earlier, 0.29.[5] Fundraising has a direct well-determined positive impact for the other three charity types too (with t-statistics ranging from 4.6 to 12.6). The big change for overseas charities from both the earlier papers' results is that the effect of price (now current, rather than lagged as in KPS) becomes significant (t = -2.7) and large – the elasticity at the mean values is estimated to be -2.0, twice the value for the full sample. The price variable is insignificant at the 5 percent level for the other three charity types.

Two obvious conclusions can be drawn from the results across the three papers. First, there seems evidence that the determinants of donations differ by cause. In particular, the results for overseas development charities are often different. Second, in some respects the three papers give similar results and in others they differ. In the case of overseas giving, government grants always have an insignificant impact. Fundraising expenditure has a positive impact in both papers using panel data (but not in the model estimated with a single year's cross-section), whether endogenised through the 'quick fix' of entering the lagged value or whether treated as exogenous with the current value entered. The same switch between methods has a dramatic effect on the effect of the price variable (which is insignificant in the cross section model).

[5] However, note that the elasticity in KPS is with respect to the one period lag, and not to the current value. The specification estimated in KPS may be thought of as a reduced form specification which can be arrived at from the specification in KS by substituting out the current values of the endogenous variables. This would imply that the estimated effects in the model with lagged values replacing the current values would be picking up not just the structural effects.

Specifying a model for donations to development charities

Our work builds on the Khanna-Posnett-Sandler papers. In doing so, we pay more attention to the supply side and, since we focus on overseas development charities, to the nature of giving to this particular cause. We model donations as a function of individuals' incomes, this reflecting the supply side in particular. Our data cover a reasonably long period, 27 years. This means that we can consider the impact of the economic cycle, which would not have been possible with the 8 year panel used by KPS and KS. But as in KPS and KS we also allow for the actions of charities and government, which are emphasised in both supply and demand side explanations of giving. We specify donations to overseas development charity *i* to be a function of the following observable factors: Fundraising of charity *i,* Government grants to charity *i,* Total household income, Inequality in household income, Disasters, and ODA. We also allow for unobserved fixed characteristics of charity *i*, as explained later in Section 4.

Income is suggested by Atkinson's identification model. Total household income rose by a factor of about 2½ over the period we consider, 1978-2004. The change from year to year was far from constant and there were periods of negative growth during the recessions of the early 1980s and early 1990s. What was the impact on donations to development charities? We also allow for changes in the distribution of income. As is well known, the rise in household incomes in the UK was accompanied by a change in its distribution. Over the period as a whole, inequality of incomes rose substantially. Has this had a favourable impact on giving for development, on account of a higher marginal propensity to give of those on higher incomes?

A model of giving that focuses on development charities needs to recognise emergency relief as an important influence on donations. A major humanitarian crisis can have an immediate and large impact on the donor perceptions of need that are at the heart of the identification model. Our data span the period of the Ethiopian famine in 1984/5. It ends with the Asian Tsunami of Christmas 2004. And there were many smaller emergencies at other times.

ODA affects perceived need in the identification model. As noted earlier, this may lead to crowding out, or it may crowd in further giving if donors view a rise in

ODA as a signal of increased need. There is also the issue of how ODA should enter an empirical model of giving. We experiment with a variable measuring the ratio of ODA to GDP. Donors may have little knowledge of ODA levels. However, there may well be greater awareness of the UK government's performance in relation to the UN target that ODA should be at least 0.7 per cent of national income. This figure is often referred to in commentary on the UK's development assistance effort. We have noted already the sharp rise in ODA from the late 1990s.

We include government grants in the model, notwithstanding the results of the Khanna-Posnett-Sandler papers. We use a substantially larger data set, which offers the hope of more precise estimates. The very large growth in government grants to overseas development charities since the late 1970s, noted earlier, makes grant income an important factor to consider. We do not hypothesise the sign of any impact, since as noted earlier there are arguments for both crowding out and for crowding in. There are also arguments for no impact: Horne et al (2005) find donors responding to a US survey to have little knowledge of the government grants received by the charities to which they give.[6]

Unlike government grants, fundraising was found in both the earlier studies using a panel of CAF data to have a positive impact on overseas donations. We have argued that fundraising may affect perceived need in developing countries and explanations of charitable giving from either the supply or the demand side provide a role for this influence.

A second effect of fundraising is allowed through a 'price' variable, which we calculated as in the Khanna-Posnett-Sandler papers as $1/(1-f-a)$ where f and a are the proportions of total expenditure spent by the charity on fundraising and administration. We have noted the marked change for overseas charities in the estimated impact of this variable between KPS and KS. Viewed as a measure of leakage of donations to overseas charities this is a far from ideal variable. It captures none of the loss of funds through corruption and misgovernment in developing countries that is the typical concern of giving to this cause (unless one can argue that this is reflected in higher administration costs resulting from charities' attempts to deal with the problem). However, we include it so as to aid comparability with the

[6] Andreoni and Payne (2008) argue that crowding out by grants may occur on the demand side, by reducing fundraising, as well as on the supply side. They find this to be important in their empirical work.

earlier literature. Like Khanna-Posnett-Sandler, we do not include a marginal tax rate in the variable's construction (given the restrictions on tax deductions prior to 2000). We considered but rejected the use of variables for the charity's age, and its other income. Given that we allow in our econometric model for unobserved fixed charity factors, which can be thought of as including date of foundation, charity age would merely measure a time trend.

3. Data and Variables

We assemble as long a run as possible of information from the CAF reports on the donations made to top fundraising charities. The reports began in 1978 and the last report for which information was collected on a consistent basis was published in 2006. There was no report in 1995, and we did not have access to the report for 1981. The reports document the donations, bequests, other incomes – for example government grants – and selected expenditures of the leading fundraising charities in the UK. (The figures for donations for each charity are obtained by subtracting the figure for legacies from the total given for 'voluntary income'.) The report at first analysed the top 200 fundraising charities in each year. Coverage increased to the top 300 in 1985, to the top 400 in 1986, and to the top 500 since 1991. (These dates refer to the year of publication.) Donations come largely from individuals, but also include those from the corporate sector and from grant-making charitable trusts. These cannot be separated in the data, but recent estimates for the top 300 charities serving all causes (not just development) indicate that corporate donations represent only about 1 per cent of total voluntary income (including legacies) and trusts about 8 per cent (Pharoah 2008: 63).

We assembled the data from spreadsheet files into a consistent format. (Full details of the assembly and cleaning of the data are given in Atkinson et al 2008.) Charity names often varied from year to year for one or more reasons (including simple changes in the abbreviated form of a name). Having homogenized the names, the next step was to assign the data for any charity from a given report to an appropriate year on a consistent basis – the financial years to which data referred in a given year's report could vary substantially.[7] We define as 'development' charities

[7] We applied the rule that where the charity's reporting year finishes before July 1st the observation is assigned to the previous year.

both the charities grouped under this heading in the CAF reports and the 'religious international' charities that are separately identified by CAF. The latter include such major development charities as Christian Aid and CAFOD.[8] The dataset contains a total of 70 overseas development charities that appear in *Charity Trends* at least once during the period we analyse, of which we drop two (see below) leaving us with 68. The names of these charities are listed in the Appendix, together with in each case the year of entry to the dataset, the number of annual observations for the charity, the number of these observations that have been 'filled-in' by us (see below), and the lengths of the charity's longest run of consecutive years, without and then with these filled-in values. The charities all have a principal focus on overseas development and relief, but include a number that serve domestic as well as overseas causes (e.g. the Red Cross and Save the Children). The median year of entry is 1989 and the median number of observations and median longest run (without filling-in) are 12 years and 6 years. The dataset also contains 742 non-development charities present in at least one year.

Filled-in data are data we have imputed where there are missing values (we impute the average of the values for the preceding and following years). Data may be missing for various reasons. The lack of the 1981 report is one cause.[9] We also impute if the same data were included by CAF in *Charity Trends* for two years running (as happens on occasion) or if data are missing for a single year for another reason. (See Atkinson et al 2008 for details.) However, we do not impute if data are missing because a charity has dropped out of the CAF rankings nor do we impute data for years before a charity enters the rankings.

Figure 1 shows the total donations going to development charities in real terms over 1978-2004, taking charities that were among the top 200 fundraisers in any year. (Years are defined on financial years, and not the CAF report years.) A series for total after-tax household income is also included, and this is the variable for household income that we include in the subsequent analysis. Both series are deflated by the Retail Price Index, as are all nominal variables that we use. We also include in the model a measure of inequality of income – we choose a measure that focuses on the

[8] We exclude the Priory of St John, commonly known as St John Ambulance, which is included by CAF in the first group.

[9] There is not always an interruption in the data for 1981 since the financial year covered by the CAF reports for any individual charity vary.

top half of the distribution, the ratio of the 90th to the 50th percentile of equivalised household income.[10]

Growth in overseas donations was far from steady over the period. The spike in 1984 and 1985 is on account of the response to the Ethiopian famine. This was in part stimulated by Bob Geldof, who organised the Band Aid Christmas single in 1984 and the Live Aid concerts in 1985. Geldof's Band Aid Trust was the charity with the most donations in the UK in 1985 (among all causes and not just overseas development), with £122m (in 2007 prices). We decided to exclude this charity from our econometric analysis since it was not founded in order to continue raising funds. Its removal still leaves a spike in the two years. For example, Oxfam had a record year in 1984, with its £109m of donations (in 2007 prices) nearly double the level of the year before. We also exclude Comic Relief from the analysis (but, like Band Aid, is included in Figure 1). This charity raises funds with a telethon and associated events every two years, so it does not raise funds each year like other charities.

Table 1 gives summary statistics on the variables we use in the model. Panels A and B report on the charity level variables for development and non-development charities respectively. The unit of analysis is the charity-year. Panel C reports on variables that vary with years, *t*, but not charities, *i*. The unit of analysis here is the year. The mean annual donations received by a development charity is £11m (2004 prices), nearly three times as large as for a non-development charity: development charities are larger than average (see Atkinson et al 2008 for more discussion). Donations vary greatly for both types of charity as shown by the large standard deviations. Statistics for fundraising and grants refer to positive values only. Information on fundraising is missing or is recorded as zero in 10 percent of cases for development charities and 15 percent of cases for non-development charities. The percentages of zeros or missing data are substantially higher for government grants – 34 percent and 58 percent respectively. In the case of fundraising, the absence of positive values is not easy to understand – these are all charities that are among the top 500 in terms of donated income and it does not seem likely that this status can be attained without spending money on raising funds. It seems more likely that fundraising expenditure has been absorbed into administration costs. Average fundraising costs for development charities are about 20 percent of donations and

[10] The variable is taken from http://www.ifs.org.uk/fiscalFacts and refers to equivalised after-tax (before housing costs) household income.

about 25 percent for non-development charities. Note that charities have other forms of income including legacies and investment income so the message is not one that charities are spending on average a fifth to a quarter of their donations on fundraising. In the case of government grants, zeros or missing values are easy to understand – many charities do not get government grants.[11] For both development and non-development charities, the mean values of the grants are large relative to donations.

Problems in estimation may arise if variables are trended. In broad terms, the ODA/GDP ratio trends downward for much of the period and total government grants trend upward. But the movements in the series are not monotonic. Grants to development charities exhibit a strong upward trend until 1994 before falling back somewhat and then rising uncertainly for the rest of the period. Figure 2 shows movements in ODA as a percentage of GDP, in log household income (as we explain below, we enter income in logs in the model) and the 90/50 ratio. As a percentage of ODA, falls until about 1998 as a result of the level of ODA stagnating in real terms. The trend is then reversed with ODA moving sharply upwards from 2009, reflecting the Labour government's commitment to meeting the UN target of 0.7 per cent national income. The 90/50 ratio rises until the early 1990s and then flattens out. Accompanying these medium to long-term trends, there is a significant variation in year to year changes.

4. Econometric Specification

Based on the discussions in Section 2, we consider the following log-linear specification for log donations y:[12]

$$y_{it} = x_{it}'\beta + z_t'\gamma + u_{it} \quad (1)$$

and $$u_{it} = \alpha_i + \varepsilon_{it} \quad (2)$$

[11] For the development charities, the time series of total government grants recorded in the CAF data matches quite well a series from a different source on grants made by the Department for International Development (Atkinson et al 2008, Figure 12).

[12] We find the log-linear model to be more appropriate given the highly skewed distribution of the un-logged donations. A dynamic specification of the above model was not supported by the data. That is, all observed persistence of the donations seemed to be adequately captured by unobserved charity specific variable.

i and *t* index charities and years respectively, α_i is a charity-specific effect (which may be correlated with observable variables), and ε_{it} is the error term. Fundraising expenditure, the 'price' variable, and the amount of government grant received by the charity enter x in log form. Without omitting a significant proportion of non-positive values of these variables, we include dummy variables to pick up these observations. (We have noted the prevalence of zeroes above.) The effect of these variables on donations is estimated therefore from the differences in the positive values only. The macro variables such as the ODA grants as a percentage of GDP, log household income, a measure of income inequality defined as the 90-50 ratio, and dummy variables to pick up the effect of the Ethiopian crises that occurred in 1984 and 1985 are included in z. Results from a model with time dummies instead of z are also presented for comparison.

There are several econometric issues that need to be addressed in the estimation of equations (1) and (2). The first issue concerns the endogenous nature of both the fundraising expenditure (and as a consequence the 'price' variable) and the amount of government grant received by the charity, due to possible correlation between these variables and the error term *u*. A positive shock to donations means that a charity can afford to spend more on fundraising. Such a shock could have positive or negative effects on the government grants it receives, depending on how these grants are allocated. Under the assumption that the correlation may be entirely captured by the unobserved heterogeneity α_i, within-group (WG) estimators of β and γ would be consistent and we present some WG results in what follows. On the other hand, if in addition, there is also correlation between the regressors and ε_{it} (as suggested by our discussion of the effects of shocks), the most appropriate technique would be instrumental variable (IV) estimation that also accounts for α_i. To allow for correlation between the regressors and the unobserved heterogeneity α_i, we first-difference (FD) the equation to eliminate the α_i and then apply the Generalised Method of Moments (GMM-diff) technique using different lags of the variables.[13]

[13] WG transformation also can be used to eliminate the unobservable α prior to the application of IV estimation using lags of the regressors as instruments. In the simple case with one endogenous regressor and no external instruments, this is equivalent to using WG estimation in the regression of the endogenous variable on the lagged endogenous regressors in the first stage. The predicted values from this regression are used as instruments in the second stage regression. As T $\rightarrow\infty$ the bias in the first stage WG regression estimator will go to zero. We have chosen to use first

The precise set of moment conditions that are used to generate the set of instruments depends on the assumptions about the above correlations. We shall return to the choice of lags we use as instruments when we discuss the results in the next section.

The second issue we have to address concerns the method of construction of our dataset and the possibility that this leads to an endogenously generated sample. As discussed in Section 3 earlier, whether a particular charity appears in the dataset for a particular year depends on whether the charity was ranked among the top R in terms of the amount of donations received by this charity in that year. The data collection procedure saw the value of R increased from 200 in 1978 to 500 in 1991. If the above selection can be captured using charity specific variable α_i, then the WG estimator or the FD estimator would be consistent. However, as we saw earlier, endogeneity due to correlation between the regressors and ε_{it} will also need to be addressed. In the absence of suitable instruments to deal with endogenous selection that might not be adequately captured by the lags of the regressors, we check for sensitivity of the results to different choices made with regard to the sample selected for the estimation.

One practical problem with the GMM approach is that the number of instruments can be numerous. Unlike in two-stage-least-squares (2SLS), where the estimation sample is restricted according to the choice of lags for the instrument, in standard applications of GMM a separate instrument is included for each time period. To illustrate this problem, consider the following example with one endogenous regressor x_{it}.

$$y_{it} = x_{it}\beta + \alpha_i + u_{it} \qquad t=1,..,5 \tag{3}$$

If we were to apply 2SLS to estimate (3) in first-differences, x_{it-2} and higher order lags of x can be used as an instrument for Δx_{it} under the assumption that $E[x_{it-s}\Delta u_{it}] = 0 \text{ for } s \geq 2$. This would imply that the estimation sample would be t=3,..,5 and every additional lag of a variable to the set of instruments would result in the loss of one extra time observation. In contrast, the standard GMM-diff approach includes separate instruments for each time period resulting in a sparse instrument set

differencing to eliminate the α and estimate the equation using GMM in order to be able to use more lags of the regressors as instruments without drastically reducing the available estimation sample, as discussed later in this section.

but larger estimation sample. In the case of GMM-diff, the instrument matrix for charity *i* would be:

$$Z_i = \begin{bmatrix} x_{i1} & 0 & 0 & 0 & 0 & 0 & 0... \\ 0 & x_{i1} & x_{i2} & 0 & 0 & 0 & 0... \\ 0 & 0 & 0 & x_{i1} & x_{i2} & x_{i3} & 0... \\ . & . & . & . & . & . & . \\ . & . & . & . & . & . & . \end{bmatrix}.$$

For example, the instruments for the regressor's observation $(x_{i3} - x_{i2})$ would be x_{i1}. Three practical problems can result with the use of a sparse instrument set (Roodman 2007). First, the instruments can be too weak to identify the relevant effects. Second, the precision of the weighting matrix that is used in the GMM estimation is affected. Third, some of the statistical tests that are used for model validation can have low power. Given these problems, we investigated the approach of a strand of the literature where the standard GMM-diff instruments are combined through addition to create a smaller instrument set (Roodman 2006, 2007). Taking the example discussed above, the new instrument matrix would be $Z_i = \begin{bmatrix} x_{i1} & 0 & 0 & . \\ x_{i2} & x_{i1} & 0 & . \\ x_{i3} & x_{i2} & x_{i1} & . \\ . & . & . & . \end{bmatrix}$.

This is achieved in *STATA* using the 'collapse' option in estimation command *xtabond2*. Based on the tests for over-identification and the tests for first and second order serial correlations, the preferred specification uses lags 4 to 9 of all the endogenous regressors (x_{it}) as instruments. All the macro variables are treated as strictly exogenous in all specifications.

We have used three tests to investigate the validity of our chosen instruments. The first is the Sargan/Hansen test for over-identification (Sargan 1958, Hansen 1982) which requires non-rejection of the null hypothesis being tested. The second and third are serial correlation tests (Arellano and Bond 1991) that tests for the presence of serial correlation in the first differenced errors ε_{it}. White noise errors ε_{it} would imply a MA(1) process for the $\Delta\ \varepsilon_{it}$, thus rejecting the null of no first order serial correlation but not rejecting the null of second order serial correlation. We use xtabond2 (Roodman 2006) in StataCorp (2005) to estimate our models using the GMM technique.

Finally, because of the number of lags that are used as instruments, when applying GMM the model is estimated using information on charities that appeared continuously in the sample for at least 7 consecutive years. We check for sensitivity of the choice of this sample.

5. Results

The results of various model specifications and estimations are presented in Table 2. (We do not report estimated coefficients of dummy variables for missing or zero fundraising, price or grant variables.) Columns [1] to [8] report models estimated for development charities only. Unless otherwise stated models are estimated for samples that exclude filled-in values. Column [1] presents the results from a pooled OLS regression. There is no allowance made for unobserved charity specific effects, although the estimation of the standard errors allows for clustering of observations at the charity level. Columns [2] to [4] present results from the Within Group (WG) estimation (i.e. OLS on variables entered in deviations from time-means). In the absence of any endogenous regressors, WG estimator will provide consistent estimators. All available observations are used in the estimations presented in column [1] and [2]. If the regressors are correlated with the charity specific unobservable α_i but not with the idiosyncratic error term ε_{it}, then WG estimators will be consistent. Most coefficient estimates change very substantially between columns [1] and [2], underlining the importance of allowing for these unobservable factors. We delay discussion of the size and significance of the estimates until describing other columns in the table.

As discussed earlier, due to the way the information was collected and recorded by CAF, the available data constitutes an unbalanced panel. Availability of information for a particular charity in a particular year was dependent on whether the charity existed in that year and also whether the amount of donations it received came in the top few hundreds to be eligible for inclusion in the CAF reports. In order to check for possible endogenous sample selection, we have estimated the same model using different sub-samples of data. The results from this exercise are presented in columns [3] and [4]. Both specifications use WG estimation. We use all observations

on those charities that entered the sample before 1985 and before 1991 respectively, years when the coverage was increased to the top 300 and then 500.

Column [5] presents results from estimating the model by GMM, allowing for fundraising, price, and government grants to be correlated with both the charity specific unobservable α_i as well as the idiosyncratic error ε_{it}. (As noted earlier, the model is estimated with 4-9 lags of the endogenous regressors as instruments.)[14] We select the longest continuous run of observations for each charity, imposing the condition that this must be at least 7 years. For example, if a charity was present for 2 consecutive years at the beginning, leaves the sample (whether through dropping out of the CAF rankings or because of missing data) and then re-enters and is present for 7 years continuously after this absence, we then keep only the last 7 years of observations for our estimation (a number chosen to ensure that we could use the appropriate lags for instruments). This leads to the model being estimated on somewhat less than half the charities and half the charity-years. We present in column [6] the results from WG estimation, using the same sample as used in column [5]. In column [7] we give results from estimating the model for for all charities for all years again, but now including the filled-in values. In these two columns we are back to allowing for correlation of the regressors with the α_i only.

The comparison of columns [2] to [4] helps gauge whether there might be a problem with sample selection that cannot be accommodated by allowing for unobserved fixed charity effects. The estimated coefficients are fairly stable for those that are statistically significant, although the impact of price in column [2] differs somewhat from that in the other two columns. The lack of much change is encouraging. The GMM model in column [5] passes the three specification tests (the number of lags used as instruments was chosen to ensure this). The results obtained using WG estimation in column [6] are reasonably similar to those obtained with GMM and the same sample in column [5]. Column [8] shows results obtained with the same sample as column [2] in which the macroeconomic variables are replaced with time dummies. The estimated coefficients for the charity variables are almost unchanged.

[14] 9 lags are used if the charity's longest run of data is 9 years or more, 8 lags if it is 8 years long and 7 lags if it is 7 years.

What do the results tell us about the determinants of donations to overseas charities? First we consider charity variables, which were the focus of the Khanna-Posnett-Sandler papers. The *ceteris paribus* direct impact of fundraising is reasonably well determined, with an elasticity of 0.2 when we use the GMM approach and 0.27-0.37 in the models estimated by WG. This is broadly similar to the level found by KPS and KS (evaluating at the mean in their case given the linear functional form used). At mean values of donations and fundraising, an elasticity of 0.2 implies that an increase in fundraising of £100k would bring forth additional donations of over £200k. However, this calculation ignores the indirect impact of fundraising coming through the price variable, which is negative and well determined (as in KS but not KPS). Given the definition of this price variable, the total elasticity of donations with respect to fundraising, including both direct and indirect impacts is given by the following expression (where net total expenditure is defined as total expenditure less fundraising and administration):

fundraising coeff. + price coeff. × (ratio of fundraising to net total expenditure).

The negative impact of price has a large dampening effect. But the estimated total elasticity is still positive in all columns [1] to [7] given the mean sample value of the ratio of fundraising to net expenditure (0.057) and typically positive at the top quartile (0.076). Government grants are estimated to have a positive effect, indicating crowding in. But the effect is small – the elasticity varies between 0.05 and 0.09 – and is not well determined. The coefficient just fails to be significant at the 5 percent level in the results obtained with GMM in column [5].

We now turn to the other variables in the model, not included in the KS and KPS analyses. Ceteris paribus, donations are estimated with the GMM approach to be a third higher in 1984, a result of the response to the Ethiopian famine. Note that this is the year before the large spike shown in Figure 1. But that spike is largely associated with The Band Aid Trust, which we have excluded from the sample used here. In fact an additional dummy for 1985 proved insignificant. The coefficients on log household income range from 0.81 in column [5] to 1.12 in column [6]. The impact of income is reasonably well determined (and in contrast to the charity variables there is only temporal variation to be exploited) but we can never reject the hypothesis of a unitary elasticity. The effect of the 90/50 ratio proves rather unstable.

It is not significant at conventional levels in either set of results obtained with runs of data of 7 years or more (columns [5] and [6]) but is significant at the 10 percent level in columns [2] and [4] and (just) at the 5 percent level in column [3] in the model estimated for charities existing prior to 1985. The coefficient of about 1.0 implies that a one standard deviation rise in the 90/50 ratio reduces donations by 12 percent. Finally, the variable for ODA as a percentage of GDP is not significant in any model. We can find evidence neither of crowding out nor of crowding in from this measure of the level of government spending on development assistance relative to national income.

In column [9] we estimate the same model for non-development charities using GMM. The specification tests reported at the foot of the table are again passed. (The sample is restricted to the longest continuous run of observations for each charity of at least 10 years.) On the one hand this is a much larger sample of data than for the development charities, which should improve the precision of the estimates. On the other, it is a much more heterogenous sample being composed of charities serving a wide range of causes, which will reduce precision if the determinants of donations vary from cause to cause. In practice, the latter effect tends to dominate for the charity level variables and the former for the macro variables (judging by the size of the estimated standard errors compared to those in column [5]). The direct effect of fundraising and of price are both less than for the development charities while we cannot reject the hypothesis that the (positive) government grants elasticity is the same. Surprisingly there is small positive impact from the 1984 dummy, albeit significant only at the 10 percent level: the obvious hypothesis was for a negative effect of the Ethiopian famine on giving to other causes. The log income coefficient is well determined. It is very similar to that in column [5] for development charities but because it is better determined we can just reject the hypothesis of a unitary elasticity at the 5 percent level, implying that giving to non-development causes (taken together) is a necessity. The 90/50 ratio is once more insignificant, as is ODA as a percent of GDP (where we would not have expected otherwise).

6. Conclusions

In this paper we have modelled the determinants of donations received by overseas development charities in the UK, using panel data that span over 25 years. In doing so

we have built on a small existing literature using the same source of data, but one that has not focused in particular on development (or any other cause) and which used substantially less data. In thinking about how to model giving for development, we have been able to draw on new theoretical insights in Atkinson (2008).

Our results may be summarised as follows:

- Fundraising has a powerful effect on donations received by development charities but the effect appears not to be monotonic. Forcing an indirect impact from fundraising through the price variable used by earlier authors, we find that the overall impact eventually turns negative. However, this price variable does not capture many of the leakages with which donors to overseas development are concerned, which have nothing to do with excessive fundraising.
- We find no evidence of crowding out of giving by government grants. Grants appear to have a modest although not very well determined positive impact. This supports the existing results in the UK literature.
- We can't reject the hypothesis that giving to overseas development has a unitary income elasticity. This is in line with results from survey microdata on individuals and their giving (Micklewright and Schnepf 2009). The estimated elasticity is similar for donations to non-development causes. A unitary elasticity implies that the current recession will not have the devastating impact on charitable donations that has been predicted in some of the mass media. We find no robust significant impact from changes in the inquality of household incomes, holding constant total income.
- We find no evidence that ODA has crowded out donations for development.

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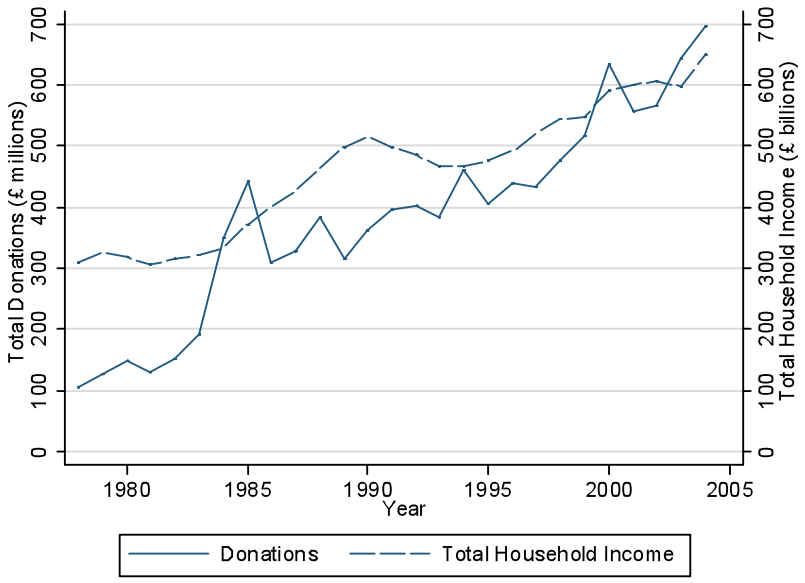
Figure 1
UK charitable donations for overseas development and total household income: 1978-2004 (constant 2007 prices)



Note: the donations refer to all overseas charities (defined as in the text) among the top 200 fundraising charities in each year.

Figure 2
Trends in macroeconomic variables, 1978-2004

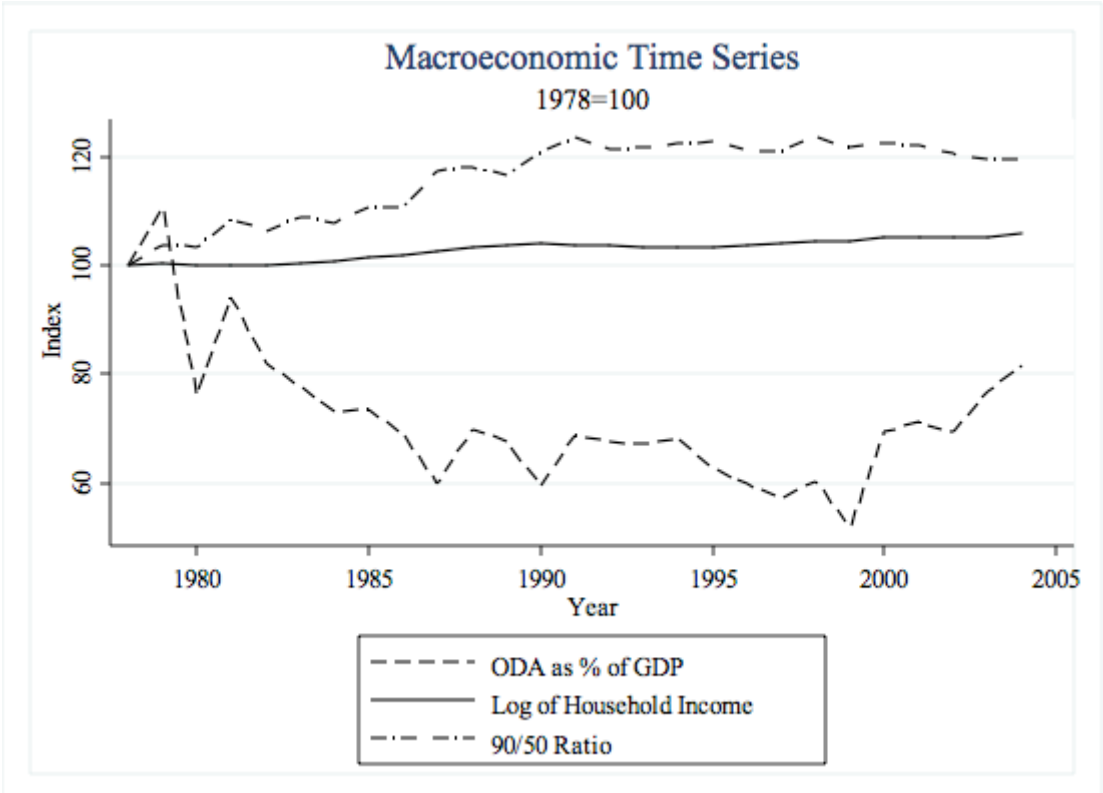


Table 1: Descriptive statistics

A: Charity Level Variables for Development Charities

	Non-Zero Observations	Mean	Standard Deviation
Donations (£000s)	800	11,176	17,677
Fundraising (£000s)	718	2,332	4,084
Government Grants (£000s)	503	8,099	12,967

B: Charity Level Variables for Non-Development Charities

	Non-Zero Observations	Mean	Standard Deviation
Donations (£000s)	8,032	4,039	9,486
Fundraising (£000s)	6,873	1,049	2,957
Government Grants (£000s)	3,343	3,824	10,063

C: Macroeconomic Variables

	Years	Mean	Standard Deviation
Household Income (£m)	27	461,260	106,211
90/50 Ratio	27	1.96	0.12
ODA as % of GDP	27	0.32	0.06

Note: The unit of analysis in Panels A and B is the charity-year and in Panel C is the year. Panels A and B refer to data for 68 overseas charities and 742 non-development charities present in the data at any time. Statistics for fundraising and grants in Panels A and B refer to positive values only. Monetary variables are in 2007 prices.