

MONEY AND TIME DONATIONS TO SPANISH NON GOVERNMENTAL ORGANIZATIONS FOR DEVELOPMENT AID

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This paper presents an empirical analysis of the determinants of money and time donations to Spanish Non Governmental Organizations for aid to less developed countries. A basic model inspired on the theory of monopolistic competition is formulated and tested taking into account that some of the explanatory variables, such as fundraising expenditures and price are endogenous in our model. The results show that the average donor is different for money and time donations and that the preferences of the government differ from those of the private donors. Partial evidence is also found that time and money donations are complementaries, but no empirical association is detected between time donations and total monetary income (money donations, plus government subsidies).

Keywords: nonprofit organizations, voluntary contributions, volunteer labour, monopolistic competition.

(JEL L31, H41)

1. Introduction

The not for profit (*NFP*) activities are steadily growing in most developed countries. Salamon and Anheier (1994) estimate that, in 1990, they amount to 6.3% of *GDP* in the USA, 4.8% in the UK and 3.2% in France. Estimates for Spain show that only in the provision of social services, not-for-profit organizations represent, in the early nineties, 0.6% of *GDP*. The growth of *NFP* activities and organization has raised the concern for evaluating their economic efficiency, together with the search for internal and external factors that may determine such

The authors thank to the Coordinadora of ONGD for kindly providing the data for this study and to Eduardo Ley and two anonymous referees for comments to an early version of the paper.

efficiency. Our purpose in this paper is to contribute to the literature on economic analysis of *NFP* organizations providing an extension of a theoretical model of monopolistic competition between such organizations, and presenting empirical evidence contrasting some predictions of the model, using data on Spanish non government organizations for development aid¹.

NFP organizations compete for private donations and public subsidies, needed to finance their activities in the provision of collective goods. Weisbrod and Domínguez (1986) establish that competition will be a disciplinary device for *NFP* organizations as it is for lucrative ones. Therefore, market competition should be a factor of external efficiency for *NFP* organizations. The authors postulate that if *NFP* organization are subject to market competition, then we should empirically observe demand functions for private donations of individual organizations which depend upon variables such as price, advertising and service quality. That is, the same variables that we would expect for any good or service. Posnett and Sandler (1989), Khanna, Posnett and Sandler (1995) and Callen (1994), follow up the line of research opened by Weisbrod and Domínguez and provide empirical support for the hypothesis of market competition as a driving force towards economic efficiency.

Our paper continues this line of research with two main contributions. First, we complete the model of monopolistic competition which is behind the demand functions estimated by the authors listed above. The model is an straight-forward extension of Dixit and Stiglitz (1977), but we assume now that competing organizations set up prices equal to average costs. Therefore, price is an endogenous variable and donations are market equilibrium solution. The model is also extended to allow for the behavioural model of *NFP* organizations postulated by Steinberg (1986), where fundraising expenditures are also endogenous.

Second, the paper presents an empirical analysis of the theoretical model using cross-section data from a sample of Spanish *NFP* organizations which provide aid to less developed countries. These organizations are the most dynamic group among the non profit Spanish organizations, with total income of 11,000 millions of pesetas (100 millions of dollars) in 1993. The empirical application provides new microeconomic evidence on performance for a group of organizations

¹For a recent survey on the economic analysis of *NFP* organizations see Rose-Ackerman (1996).

not studied before in a country, Spain, with social institutions quite different from the Anglo-Saxon countries where most previous studies were based. Our data allows us to distinguish between money and time donations (volunteers) and government subsidies. Therefore, we are able to compare the determinant factors behind the three sources of income. Moreover, we test for the complementarity between time and money donations, as well as for efficiency in fundraising expenditures decisions.

The paper is organized as follows. In section two we present the theoretical model and the empirically testable hypothesis that are derived from it. Section three describes the empirical data for the *NFP* organizations studied in the paper. In section four we show the results of testing the model. The conclusion summarizes the main results of the paper.

2. The Model

2.1 Theory

Demand side

Consider a situation where each donor makes time and/or money donations which will be consumed by others (pure altruism). There are n varieties of excludable goods or services produced and consumed, each provided by a different *NFP* organization. In the empirical part of the paper each *NFP* organization is a non-government organization providing aid to less developed countries. It is assumed that the average donor has preferences represented by the utility function²,

$$U = U(Q_0, (\sum b_i Q_i^\rho)^{1/\rho}) = Q_0 + (\sum b_i Q_i^\rho)^{1/\rho},$$

where Q_0 is the quantity consumed of other goods, $Q_i, i = 1, \dots, n$, is the quantity consumed of variety i , and $b_i, i = 1, \dots, n$, are parameters. The value of b_i is a measure of the intensity of preferences for variety i , we assume that $\rho \leq 1$ to assure that U is a concave function.

Let $p_o, p_i, i = 1, \dots, n$, be the prices of goods and services. The average donor would choose $Q_0, Q_i, i = 1, \dots, n$, such that U is maximized

²The modelling of preferences for the representative donor follow closely the methodology proposed by Dixit and Stiglitz (1977); see also Tirole (1988, chapter 7). Anderson *et al.* (1992) show how to aggregate from individual demand functions into the average consumer demand.

subject to the income, I , constraint³,

$$\begin{aligned} &Max Q_0 + (\sum b_i Q_i^\rho)^{1/\rho}, \\ &Q_0, Q_1, \dots, Q_n \\ &subject\ to\ \sum p_i Q_i + Q_0 = I \end{aligned}$$

Substituting $Q_0 = I - \sum p_i Q_i$ in the objective function and taking the derivative with respect to Q_i we obtain the first order conditions, for each i ,

$$-p_i + 1/\rho(\sum b_i Q_i^\rho)^{1/\rho-1} b_i Q_i^{\rho-1} = 0$$

or

$$Q_i = B b_i^{1/1-\rho} p_i^{-1/1-\rho}$$

where $B = (\sum b_i Q_i^\rho)^{1/\rho}$ is the total utility received from the varieties of public goods. In what follows it is assumed that n is sufficiently large so that changes in Q_i do not affect significantly the value of B . Under this assumption, the consumption of variety i , Q_i , increase with b_i , the intensity of preferences, and decreases with the price, p_i . Moreover, $-1/1 - \rho$ is approximately equal to the price elasticity of demand for variety i . This elasticity increases, in absolute value, with ρ , so that in the limit when $\rho = 1$ all varieties of public goods are perfect substitutes and the price-elasticity of demand would be infinite.

It is assumed that each variety of public good is produced by a single *NFP* organizations. Therefore variety i is associated with organization i . Donors "purchase" variety i making money and time donations to organization i . Therefore, the donations received by organization i , D_i , will be, under the previous assumptions, equal to,

$$D_i(p_i) = p_i Q_i = B b_i^{1/1-\rho} p_i^{-\rho/1-\rho} \quad [1]$$

Equation [1] may be considered a demand function for variety i which determines the donations received by organization i as a function of the attraction parameter b_i and the price p_i .

Supply side

Each *NFP* organization uses donations to pay operating and promotional expenditures and to produce the public good i . Therefore, the output Q_i produced by organization i will be equal to,

$$Q_i = D_i(F_i) - F_i - A_i \quad i = 1, \dots, N. \quad [2]$$

³We assume $p_0 = 1$.

where, F_i , is the promotional expenditure and A_i is the operating cost. Advertising and promotion activities are an important input in *NFP* organizations since in many cases those organizations are precisely justified when there are acute problems of information asymmetries between consumers and producers (Krashinsky, 1986; Ben-ner, 1986). Notice that the buyer of the services (the donor) is most often different from the actual consumer (those receiving the services provided by the organization), and the production technology of the organization is complex (as when the receiver of the donation is a research institution). Therefore the organizations will use internal resources to develop promotional and advertising campaigns in order to inform potential donors about themselves and the activities they perform, and convince them to financially support each particular program.

In what follows, it will be assumed that promotional expenditures, F_i , will affect the attraction parameter b_i of the demand function of donations given in [1], i.e., we will write,

$$D_i(F_i; p_i) = B(b_i(F_i))^{1/1-\rho} p_i^{-\rho/1-\rho} \quad [3]$$

where $b_i(F_i)$ is an increasing and concave function of F_i .

Under the assumptions above, the *NFP* organization i will be subject to the financial constraint

$$D_i(F_i; p_i) = p_i Q_i(F_i; p_i) = Q_i(F_i; p_i) + F_i + A_i$$

Therefore, the price p_i charged by the organization i will be its average cost, c_i ⁴,

$$p_i = c_i = \frac{D_i(F_i; p_i)}{Q_i(F_i; p_i)} = \frac{D_i(F_i; p_i)}{D_i(F_i; p_i) - F_i - A_i} \quad [4]$$

In other words, if a donor wants to buy one unit of net output it will have to pay a price equal to average cost as defined by [4].

The economic model defined by equations [3] and [4] is consistent, in its mathematical formulation, with the model proposed by Weisbrod and Domínguez (1986) and often used in the literature (see for example Posnett and Sandler (1989)). In this model the donations received by organization i are increasing with quality and decreasing with price.

⁴This assumption, or the financial constraint where it comes from, is a consequence of the fact that any difference between income and costs has to be transformed into output

Moreover, quality it is assumed to increase with fundraising expenditures but, at the same time, an increase in these expenditures implies a higher price (and cost) for the donor, since there will be less resources available for the provision of the public good.

However, in our theoretical model we assume that *NFP* organizations compete in a market with product differentiation with a pricing policy of price equal to average cost as given by [4]. Therefore the donations of organization i are in fact equilibrium solutions of a competitive process in a monopolistic competition market. This has implications for the empirical analysis, since price p_i can not be considered a predetermined variable (equal to previous period cost) but a decision variable of the organization chosen equal to current average costs.

Another important issue in the model above is the choice of F_i , the fundraising expenditures. Steinberg (1986) assumes that donors do not take into account the effect of these expenditures on the price-cost and postulates a behavioural model for the *NFP* organization which, in our notation, could be formulated as

$$\underset{F_i}{\text{Max}} B[b_i(F_i)]^{1-\rho} p_i^{-\rho/1-\rho} - k_i F_i - k_i A_i \quad [5]$$

where p_i is assumed to be exogenous and k_i is the opportunity cost of fundraising of the *NFP* manager. The value of k_i is between zero and one. A value of zero would imply that the manager maximizes donations, while a value of $k_i = 1$ (assumed to be the social opportunity cost) implies that managers maximize the production of the public good, Q_i .

Weisbrod and Domínguez (1986), on the other hand, consider that fundraising is a measure of reputation (quality) of the organization which can be taken as given in a period of time, t , and which can be approximated by previous period expenditures. Therefore according to Steinberg F_i is endogenous (as the price), while according to Weisbrod and Domínguez is predetermined.

2.2 The empirical formulation

The empirical model is formulated taking into account equations [3] and [4] and the behavioural process described in the theoretical subsection. For each organization in the sample we have data on the total income received in a given year, on operating expenditures and

on some characteristics which can be related to reputation indicators, such as age, ownership and legal form. Therefore, taking logs in [3] we obtain a log-linear function,

$$\ln D_i = \alpha_0 + \alpha_1 \ln F_i + \alpha_2 \ln c_i + \alpha_3 \ln Rep_i + u_i \quad [6]$$

where Rep_i is the vector of reputation indicators of organization i ; price, p_i , is substituted by average unit cost, c_i ; and u_i is the error term. Notice that $\alpha_2 = -\rho/1 - \rho$ is an approximation to the price-elasticity of donations⁵.

Total income, D_i , is separated into money donations, time (volunteers) donations and government subsidies. Since it may be argued that government subsidies are determined by other reasons (i.e. political interests) than the economic factors outlined above, the empirical analysis will consider different assumptions on the treatment of such subsidies. Information is also available on whether volunteers are placed in the central office or they are assigned to development projects. Central office volunteers will be considered production inputs of the organization. In order to be able to aggregate time and money donations in a single measure of total donations, volunteers time is transformed into monetary units by applying an estimated year salary⁶. The disaggregated information on time and money donations allows us to postulate several empirical models to investigate whether each type of donations is determined by the same theoretical model and to test whether they are complements or substitutes.

Another important empirical issue is the measurement and econometric treatment of the variables F_i and p_i . No precise data on promotion expenditures is available and consequently F_i has to be estimated by total operating costs of organization i (excluded the imputed cost of volunteers in central office). Price is taken equal to average cost as defined in [2], where $D_i(F_i, p_i)$ is equal to the total income of the organization (money donations, imputed monetary value of volunteers time and government subsidies); F_i is equal to operating costs as reported by the organization; and A_i is the imputed cost of volunteers in central office.

⁵It is assumed that $b_i(F_i)$ is a potential function $b_i(F_i)^\delta$, $0 < \delta < 1$. Therefore, taking into account [3], $\alpha_1 = \delta/1 - \rho$; this assumption simplifies the econometric estimation.

⁶Each volunteer-year it is assumed that works 1,600 hours with an estimated cost per hour of 3,000 pesetas. These values are representative of working time and labor costs in Spain, during the early nineties.

Following the different assumptions of the previous literature on the actual behaviour of the organization, alternative estimations of the empirical model will be presented with F_i , and p_i treated either as predetermined (as Weisbrod and Domínguez or Posnett and Sandler), or treated as endogenous. In the second case F_i and p_i will be instrumented by their previous year values, while in the first case they will be set equal to their previous year values.

3. The Spanish non Government Organizations for Development Aid

The model presented above will be tested with data from Spanish Non Government Organizations for Development Aid, NGODA. There are over 150 such organizations, most of them born in the past 10 years, whose main purpose is summarized as follows: *To channel public and private resources in order to carry out autonomous development projects in non developed countries, complementing those carried out by governments and international organizations. They also take actions in order to inform and educate Spanish people about social and economic situation of Third World Countries, and they act as lobby groups to influence government and political bodies in their decisions about development aid* (Zavala Matulic, 1994, p. 215)⁷.

In 1992, 82 of the total NGODA were federated into a Coordination Unit and data on activities and performance of such organizations started to be collected. From these data we were able to obtain complete information for 50 of the 82 federated organizations corresponding to the years 1992 and 1993. Those 50 organizations obtained a total income of around 120 million dollars, half of which from private donations and the rest from public subsidies. They had 14,508 workers of which 79% were volunteers⁸.

According to the descriptive data of Table 1, 44% of the NGODA have a total estimated income not higher than 100 millions of pesetas, and only 18% of them have income above 500 millions of pesetas. Total estimated income is equal to monetary private donations, public subsidies and the estimated monetary value of time donations. Two thirds

⁷As these organizations spend resources to "inform and educate", it may be argued that part of the promotion expenditures should be considered as output. However, we can not distinguish what part of the expenditures go to that end.

⁸The 50 organizations of the sample represent 72% of total monetary donations to NGODA.

of the *NGODA* in the largest size class belong to religious organizations. The legal form of foundation is also more frequent among large organizations (45%) than among the total sample (24%).

TABLE 1
Descriptive information on *NGODA*

Classification	Number	Religious	Foundations	Age*	Partners*	Delegations Spain	Delegations other countries†
<i>Total Income (I)</i>							
I ≤ 100 mill.	22	5	2	9.68	3120.73	4.36	0.27
100 > I ≤ 500 mill	19	9	6	9.37	6054.68	6.58	1.42
I > 500 mill	9	6	4	19.56	11575.11	18.11	0.56
<i>Ownership</i>							
Non Religious	30	-	7	9.40	2552.87	5.10	0.67
Religious	20	-	5	14.25	7714.25	11.55	0.90
<i>Legal form</i>							
Associations	38	15	-	10.39	4043.37	5.42	0.61
Foundations	12	5	-	14.33	6435.25	14.83	1.25
Total sample	50	20	12	11.34	4617.4	7.68	0.76
Median				8.00	199.00	2.50	0.00

Source: Own elaboration from Coordinadora de *NGODA* 1994, 50 *NGODA*

* Average values in each class

NGODA are fairly young, average age of 11.34 years; as expected, age and size are positively related and larger organizations have an average age of 19.60 years. Size is also positively correlated with the number of partners and with the number of delegations inside the country, but no relation is detected between size and number of delegations in foreign countries.

For each of the 50 selected organizations we have information on all the variable listed in Table 2, which will be later used in the empirical test of the model. Total operating cost include advertising and promotion expenditures together with other general expenses (labour, materials, depreciation...). Since no disaggregated data are available, we will use total costs as a measure of expenditures in advertising and fundraising. Descriptive statistics for the variables listed in Table 2, as well as some complementary information, are presented in Table 3. The sample mean of each variable is larger than the median which implies that the distribution of values is skewed to the right. The estimated unit cost has a mean value of 1.37, in line with the figures obtained in data of other countries. However monetary donations over total income represent lower percentage values than those reported by

Posnett and Sandler (1989) for the UK, while operating cost represent higher percentage of monetary donations than in other studies.

TABLE 2
List of variables and their definitions

Variable	Definition
<i>Monetary donations</i>	Pesetas received annually from private donations
<i>Volunteers</i>	Number of persons-year working as volunteers for the organization
<i>OPERC</i>	Operating costs per year (includes advertising and promotion expenditures).
<i>AGE</i>	Number of years since the organization was created
<i>DRE</i>	Dummy variable which takes the value of 1 if the organization is controlled by religious group, and 0 otherwise
<i>DFUN</i>	Dummy variable which takes the value of 1 if the organization has adopted the legal form of foundation, and 0 otherwise.
<i>SUBCEN</i>	Pesetas received annually as subsidies from the central government
<i>SUBLOC</i>	Pesetas received annually as subsidies from the local government
<i>UNCOST</i>	Unit costs for the donors of obtaining one unit of output. Estimated as $UNCOST = Total\ Income / (Total\ Income - OPERC - Volunteer\ in\ office)$ Where Total Income is obtained as the sum of monetary donations, public subsidies and the monetarized value of time donations.

We want to explain the donations received by each organization as a function of attraction/preference attributes and unit costs (equation [3]). The variables *OPERC*, *AGE*, *DRE*, *DFUN* are selected as proxies of parameter b_i . Operating costs have to be used as substitutes of advertising expenditures and promotion expenditures since no separate data on these expenditures is available. The number of years since the organizations was created, *AGE*, will be considered a measure of reputation and experience which may influence the preference of the donors⁹. The ownership dummy variable, *DRE*, distinguish between religious and no religious organizations; we could expect that donors may have different preferences depending upon the group that controls the organizations, for ideological, specialization or internal efficiency reasons. Similar arguments are used to justify the presence of the variable legal form, *DFUN*; the choice of the legal form may affect the internal controls that the organization has to follow and this in turn may act as a bonding signal for the donors.

In some specifications, public subsidies from central, *SUBCEN*, and local, *SUBLOC*, governments will also be included among the explana-

⁹This assumption is made in all empirical papers.

tory variables of donations. This inclusion is justified from the theories on “crowding-out”¹⁰, but we also consider the case where the government contributions may serve as quality index for private donors¹¹. The former postulate a negative value for the coefficient of the subsidy variables, while the later postulate a positive coefficient.

TABLE 3
Descriptive statistics of selected variables**

	Mean	Median	Standard deviation
<i>Monetary Donations</i>	193,207.8*	18,114.95	673,161.8
<i>Number of Volunteers</i>	228.5 ^a	14.88	651.8
<i>UNCOST</i>	1.37	1.16	0.54
<i>OPERC</i>	54,335.3*	15,173.01	115,800.0
<i>SUBCEN</i>	111,703.2*	19,717.24	197,095.7
<i>SUBLOC</i>	17,964.2*	5,052.1	37,108.9
<i>AGE</i>	11.3 ^b	8.0	9.7
<i>DRE</i>	0.20		
<i>DFUN</i>	0.12		
<i>Monetary Donations</i>			
<i>Total Income</i>	0.30	0.15	0.22
<i>Time Donations</i>			
<i>Total Income</i>	0.39	0.30	0.34
<i>Gov. subsidies</i>			
<i>Total Income</i>	0.30	0.37	0.32
<i>OPERC</i>			
<i>Monetary Donations</i>	0.89	0.82	0.94
<i>OPERC</i>			
<i>Total income</i>	0.18	0.09	0.21
<i>OPERC</i>			
<i>(Total Income-OPERC-Vol of.)</i>	0.37	0.24	0.17
<i>Volunteers in projects</i>			
<i>Total volunteers</i>	0.08	0.54	0.30

** Values referred to 1993

* In pesetas

^a Number of persons-year

^b In years

4. Estimation of the empirical model

The basic equation to be estimated is [6], where reputational variables include age, control group and legal form. The dependent variable will change according to the purpose of the estimation.

Table 4 shows the results of estimating the model when the dependent variable only distinguish between total income and private donations,

¹⁰ See Bergstrom *et al.* (1986), Cornes and Sandler (1984), Andreoni (1990) and Ley (1996).

¹¹ See Rose-Ackerman (1986) and Steinberg (1991).

where private donations are equal to total income minus government subsidies. The first two columns of the table show the parameters estimated when *OPERC* and *UNCOST* are considered predetermined and their values in the regression are set at their values in the previous year-period. As it was mentioned above, this has been the common practice in the literature so far. The last two columns, on the other hand, consider *OPERC* and *UNCOST* endogenous variables and the estimation is made by the method of instrumental variables using as instruments *OPERC* and *UNCOST* lagged one year.

TABLE 4
Parameters estimation of model [6]

Variables	Openc and Uncost equal to their previous year value (predetermined)		Openc and Uncost instrumented by their previous year value (endogenous)	
	Total income	Private donations	Total income	Private donations
<i>Constant term</i>	7 940 (8 003)***	8.282 (7.587)***	-2 411 (-2 021)**	-2.404 (-1.291)
<i>ln OPERC</i>	0 273 (2 351)**	0.114 (0.809)	1 181 (10.216)***	1.143 (5.844)***
<i>ln UNCOST</i>	-0 385 (-2.655)*	- 0.204 (-1.341)	-1.244 (-10.680)***	- 1 127 (-7 067)***
<i>AGE</i>	0.071 (3 379)***	0 086 (3 999)***	0.028 (2.365)**	0 034 (2 112)**
<i>DRE</i>	1.074 (2.821)***	1.914 (4 706)***	0.065 (0 281)	0 574 (1 687)*
<i>DFUN</i>	- 0 111 (- 0 243)	-0.066 (- 0 139)	-0 343 (-1 317)	-0 616 (-1.837)*
<i>ln SUBCEN₋₁</i>		-0.017 (-0.480)		-0.038 (-1.592)
<i>ln SUBLOC₋₁</i>		0 084 (2 527)**		0.004 (0.164)
<i>n</i>	50	50	50	50
<i>R² Adj.</i>	0 46	0 52	0.82	0.77
<i>Breusch-Pagan</i>	4.07(5)	4 46(7)	5.80(5)	6.72(7)
<i>F</i>	9 33***	8.54***	47 34***	24 52***

Note t-values in brackets ***, **, *, indicate significantly different from zero (two tails test) at 1%, 5% and 10% respectively The Breusch-Pagan statistic does not reject the null hypothesis of non heteroskedasticity of the regression residuals

The goodness of fit of the model is significantly higher when *OPERC* and *UNCOST* are treated as endogenous variables. Moreover, in this case the coefficients of the two variables are significantly different from zero at the 1 per cent level of significance. Therefore, the empirical evidence appears to be consistent with the predictions of the theoretical model in which firms set price equal to average cost and choose fun-

draising expenditures to maximize output. The estimated coefficients confirm that fundraising expenditures increase the total donations, while price has a negative effect on them, with an approximate price-elasticity of -1.2. i.e., a price elasticity greater than one, in absolute value. The coefficient of *AGE* is positive and significant, which indicates that older organizations are perceived as more reputed than new ones.

Results change slightly when the dependent variable excludes government subsidies (last column of the Table). Operating costs, price and age maintain their estimated coefficients, but now the coefficient of *DRE* and *DFUND* are also significantly different from zero, the first with a positive sign and the second with a negative one. Therefore private donors view religious control as a positive reputational signal, while the legal form of foundation is viewed as negative. The estimation of private donations includes local and central government subsidies, lagged one year period¹², as explanatory variables, but neither of them has a statistically significant coefficient. This means that no evidence of crowding out or quality index for the government subsidies is detected, although the non statistical significance may also indicate that the two effects cancel out.

4.1 *Is there and homogeneous average donor?*

When donations and government subsidies are aggregated into a total income measure, it is implicitly assumed that there is an homogeneous average donor, in terms of preferences, for money donations, time donations and government funding. This assumption can be tested by postulating and estimating a separate model for each source of income. Table 5 presents the results of such estimation, obtained by the *SURE* methods¹³.

The assumption that money donations, time donations and government subsidies all respond to the same preference function, is clearly rejected by the empirical evidence. Monetary donations are the donations better explained by model and the evidence confirms that they are positively associated with fundraising expenditures and age (as a reputation variable), but negatively associated with price. Control

¹²We assume that private donors look at previous year value when make the decision.

¹³The seemingly unrelated regression estimation. *SURE*, is used to account for possible relations among the error terms of the three models.

group, legal form and government subsidies (lagged) are no longer statistically significant. Notice also that the price elasticity of monetary donations almost doubled, in absolute terms, compared with the elasticity of total income (see Table 4).

TABLE 5
Results of the sure estimation of model [6] for each type of donation and for government subsidies

	Money Donations	Time Donations	Governments Subsidies
<i>Constant term</i>	-0 205 (-0 166)	-0.534 (-0.199)	-3.408 (-0.823)
<i>ln OPERC</i>	1 144 (7.131)***	0 279 (0.803)	1.531 (3 156)***
<i>ln UNOCOST</i>	-2.351 (-5 524)***	- 1.749 (-1 891)*	- 2.623 (-1.744)*
<i>AGE</i>	0.025 (1.678)*	0 088 (2 688)**	0 088 (1.593)
<i>DRE</i>	0.391 (1.293)	2.371 (3.605)***	-4.696 (-4.489)***
<i>DFUN</i>	-0.209 (-0 626)	- 0 979 (-1 344)	0.572 (0.453)
<i>ln SUBCEN₋₁</i>	0 002 (0.064)	- 0 086 (-1 636)*	
<i>ln SUBLOC₋₁</i>	0.007 (0 296)	0 106 (2.025)**	
<i>n</i>	50	50	50
<i>R² Adj.</i>	0.76	0.49	0.39

Note. t-values in brackets. ***, **, * indicate significantly different from zero (two tails test) at 1%, 5% and 10% respectively. *OPERC* and *UNOCOST* are instrumented by its lagged value

Time donations, on the other hand, are less price elastic but more highly sensitive to reputation variables, such as age and control group than money donations. In other words, time donations are higher for older organizations and for organizations under religious control. The *OPERC* variable is non statistically significant, so fundraising efforts do not seem to have any significant effect on time donations. Notice also that central government subsidies show a “crowding-out” effect for time donations, while local government subsidies appear as quality index. Finally, government subsidies respond to price and fundraising expenditures in a similar way as time donations do, except that government subsidies are much lower for religious organizations than for non religious ones.

In conclusion, the representative average donor of money seems to be different, in terms of preferences, from the representative donor of time

(volunteer). The former is more sensitive to “advertising” and price, while the latter responds to religious convictions, to organizational age, and, to less extent, to price. The preference function of the government differs from the function of the private donor since it shows preference for non religious organizations, while private donors are indifferent or show negative preference for them. There is some evidence that government subsidies may have a crowding-out effect, when they come from the central government, and a quality index effect, when they come from local government, on time donations.

4.2 *Time and money donations: complements or substitutes?*

There is empirical evidence that money and time donations are complements at the individual donor level. That is, those that donate money are also more likely to be volunteers¹⁴. Callen (1994) also finds evidence of such complementarity looking at data from *NFP* organizations. Table 6 presents the evidence on such complementarity from our data.

Time donations, volunteers, are treated as an endogenous variable and therefore, we have two simultaneous equations which are estimated by two stages least squares. The coefficient of time donations in the monetary donations equation is consistent with the assumption of complementarity. Organizations with more time donations also receive more private money donations, although the estimated coefficient is only statistically significant at the 10 per cent level¹⁵. The last column of Table 6 shows the results of estimating the model when the dependent variable is the total monetary income of the organization, equal to monetary donations plus government subsidies. The coefficient of the time donations variable is no longer statistically significant, so total monetary income would be independent of time donations¹⁶.

¹⁴Brown and Lankford (1992).

¹⁵The positive association between time and money donations may also be due to supply factors; for example, it could happen that some volunteers are dedicated to fund-raising activities

¹⁶Two sets of simultaneous equations are estimated, one composed of monetary donations and time donations as dependent variables, and the other set with monetary income and time donations as dependent variables. Only one estimation of the time donations model is reported in Table 6, the one for the first set of equations, since they both give equal results.

TABLE 6
Results of the test of complementary between time and money donations
Simultaneous Equation Estimations

	Money Donations	Time Donations	Governments Subsidies
<i>Constant term</i>	-0.063 (-0.052)	-0 061 (-0 023)	0 654 (2 614)
<i>ln Volunteers</i>	0 114 (1 807)*		0 060 (0 953)
<i>ln OPERC</i>	1 099 (7.037)***	0.203 (0.581)	1 193 (9.501)***
<i>ln UNCOST</i>	-2.131 (-5 011)***	-1.624 (-1.752)*	1 840 (-4 471)***
<i>AGE</i>	0.016 (1 011)	0 090 (2 762)**	0.03 (0.173)
<i>DRE</i>	0 138 (0.417)	2.471 (3.750)***	-0.549 (-1.796)*
<i>DFUN</i>	-0.089 (-01.268)	-0.922 (-1.264)	-0.06 (-0 258)
<i>ln SUBCEN₋₁</i>	0 013 (0.560)	-0.073 (1.387)	
<i>ln SUBLOC₋₁</i>	-0.003 (- 0 131)	0 116 (2 193)**	
<i>n</i>	50	50	50
<i>R² Adj.</i>	0.77	0.49	0 76

Note t-values in brackets ***, **, *, indicate significantly different from zero (two tails test) at 1%, 5% and 10% respectively. *OPERC* and *UNCOST* are instrumented by its lagged value

4.3 Are non-governmental organizations for development aid efficient?

The behavioural model of the *NFP* organization given in [4], adapted from Steinberg (1986), postulates that the organization will choose promotion expenditures, F_i , such that the marginal return is equal to the marginal private cost, k_i , i.e.,

$$\frac{\delta[B(b_i(F_i)^{1/1-\rho} p_i^{-\rho/1-\rho})]}{\delta F_i} = k_i$$

If we can calculate the marginal return from the empirical models, then, assuming that the marginal condition above is satisfied for the actual value of F_i and p_i , it will be possible to obtain an estimate of k_i . Since the marginal social cost of fundraising expenditures is assumed to be equal to one, an estimated value of k different (lower) than one will indicate that private and social costs are different and the *NFP* organizations are socially inefficient.

Given the empirical results of the models estimated above, time donations, (volunteers) are not sensitive to F_i , promotion expenditures,

so the behavioural model is reformulated to account for this result. Moreover, in what follows it is assumed that k_i will be the same for all i , assumption usually made in the literature. The actual derivation of the optimal condition is presented in Appendix 1. There, it is shown that the implicit value of k is obtained from

$$k = \frac{\eta_F}{F/M(F, p)}$$

where η_F is the elasticity of total income with respect to fundraising expenditures, equal to

$$\eta_F = \left[\beta_2^v \frac{V(p)}{\text{Total income}} + \beta_2^m \frac{M(F, p)}{\text{Total income}} \right] \times \frac{F}{\text{Total income} - F - A} + \beta_1 \frac{M(F, p)}{\text{Total income}} = k \frac{F}{\text{Total income}}$$

where β_2^v is the price-elasticity of time donations, β_2^m is the price-elasticity of monetary income (money donations + government subsidies), β_1 is the partial elasticity of monetary income with respect to fundraising expenditures, $V(p)$ is total time donations, $M(F, P)$ is total monetary income.

TABLE 7
Estimated Elasticities

	Total Income	Private Donations	Money Donations	Time Donations	Government Subsidies	Monetary Income
<i>Uncost</i> (β_1)	-1.24 (0.116)	-1.13 (0.171)	-2.35 (0.425)	-1.75 (0.925)	-2.62 (1.504)	-1.84 (0.411)
<i>Partial F</i> (β_2)	1.18 (0.116)	1.14 (0.195)	1.14 (0.015)	0.28 (0.348)	1.53 (0.485)	1.20 (0.126)

Note: Standard errors in brackets

To calculate η_F , the values of β_2^v , β_2^m and β_1 are taken from the estimations of model [5] summarized in Table 7, while the rest of the variables are taken from the Table of descriptive statistics. Notice that η_F will vary from one organization to the other depending upon their respective values of $V(p)/\text{Total Income}$, $M(p, F)/\text{Total Income}$ and $F/(\text{Total income} - F - A)$. Following the usual practice in the literature, we evaluate η_F at the mean sample values of these variables to obtain,

$$\eta_F = -(1.75 * 0.4 + 1.84 * 0.6) * 0.37 + 1.20 * 0.6 = 0.052$$

with a standard error of 0.17. Since the mean value of $F/\text{Total income}$ is 0.18, the estimated value of k will be $0.052/0.18 = 0.29$, with a standard error approximately equal to $1(0.17/0.18)$. So, both extreme values of k , 0 and 1, are within $+/-2$ standard errors of the estimated value $k = 0.29$. This means that the test of efficiency is inconclusive

However, these results have to be taken with caution. First, because the estimated value of η_F is highly sensitive to the values of the weight variables chosen from the sample. For example if the median values instead of the mean values are used to weight the elasticities, then the estimated value of η_F is 0.53, and the estimated value of k is higher than one. Second, because, as Steinberg (1986), pp. 513-515, points out, we can not be sure that there are not side effects derived from promotion expenditures, not considered in the model and/or in the estimation¹⁷.

5. Discussion and conclusion

The empirical evidence provided in this paper shows that money and time private donations to Spanish not-for-profit organizations who channel development aid to Third World Countries, respond to the same determinant factors of attraction/quality and cost/price attributes that determine the sales of goods and services in for-profit enterprises. This evidence may be interpreted, in line with other related work in this subject, in the sense that competition forces may act as disciplinary devices for not for profit organizations and, consequently, the restriction of competition forces those organizations towards private and social efficiency.

Monetary donations show a unit cost/price elasticity of -2.35 i.e., the demand function of donations to individual organizations is price-elastic. The elasticity of monetary donations to our proxy measure of fundraising expenditures is slightly greater than one: 1.14. These elasticities are similar to the elasticities estimated by Weisbrod and Domínguez (1986) and by Posnett and Sandler (1989) for charity donations in the US and UK, respectively. Differences in the social and economic institutions of Spain with respect to the Anglo-Saxon coun-

¹⁷Notice that another of the possible sources of error mentioned by Steinberg (1986) in this estimation of k , the possible complementarity or substitutability between time and money donations, does not apply here since we explicitly take into account the two types of donations.

tries do not seem to affect the behaviour of donors towards not-for-profit organizations¹⁸.

No evidence is detected of crowding out of private donations by government subsidies. This will be consistent with predictions from the public finance literature, in the sense that such crowding out may not occur when government subsidies come from revenues collected by the tax system from a larger population than the population of donors (theorem 6 of Bergstrom et al. (1986)), as well as consistent with the argument that government financing may be a quality signal for the donors: the fact that government subsidies do not affect monetary donations may indicate that crowding out effects cancel out with quality signal effects.

The paper compares the determinants of time donations, volunteer's work, with the determinants of money donations. Age and religious control of the organizations are positive factors in receiving time donations, while operating costs do not seem to affect this dependent variable. The price elasticity of time donations is also lower than for money donations. Therefore the attraction of time donations seems to depend more on intangible attributes such as experience (age) and religion, while the attraction of money donations seems to depend more on economic variables such as fundraising expenditures and price. This empirical evidence contrasts with the results of Callen (1994) who finds a positive influence of fundraising expenditures on time donations, while the rest of the variables (price, age and government subsidies) have non statistically significant coefficients.

Government subsidies determine time donations, but, as stated above, they do not affect monetary donations. The positive and significant coefficient of the variable subsidies from local government may be evidence that local governments are more able to provide quality signals than central governments, since they are closer to the donor and to the organizations that receive the donation. When the government is considered a donor, the estimated model shows that the preference function is different from the function of the representation private donor.

¹⁸Taking into account that the price elasticity of demand is equal to $-\rho/1-\rho$ and $1/1-\rho$ is the elasticity of substitution among varieties in the utility function of the donor, from the estimated value of -2.35 we obtain an elasticity of substitution for money donations equal to 3.3. and the estimated value of $\rho = 0.7$. On the other hand, from note 5, we have $\delta = \alpha_1(1-\rho) = 1.14 * 0.3 = 0.342$. Therefore, all the estimated values of the parameters are consistent with the initial assumptions. The elasticity of substitution for time donations is 2.7.

Another result of the paper is that time and money donations appear as complements, i.e., those organizations which receive more volunteers also receive more money donations. However, the estimated coefficient which measures the impact of volunteers in money donations has a relatively high error term and the coefficient is only statistically significant at the 10 per cent level. Secondly, when the dependent variable is total monetary income, money donations plus government subsidies, then the volunteers variable is no longer statistically significant, which implies that volunteers and monetary income, as defined, can be considered independent.

Finally, the answer to the question: are Spanish *NFP* organizations for development aid efficient?, can not be answered with precision since the result is highly sensitive to the sample values used to estimate the parameter which corresponds to the private cost of fundraising expenditures. In any case, for the mean sample values, the test of efficiency gives unconvulsive results.

Appendix

Solution of Steinberg's (1988) behavioural model

Given that only monetary donations and government subsidies are sensitive to our proxy of fundraising expenditures, we write, for any i ,

$$\underset{F}{Max} \quad Total \text{ Income } (F, p) - kF = V(p) + M(F, p) - kF - kA$$

where $V(p)$ is time donations, as a function for price, and $M(F, p)$ is the total monetary income of the organization as a function of fundraising expenditures and price,

$$\begin{aligned} V(p) &= \gamma_1 p^{\beta v_2} \\ M(F, p) &= \gamma_2 F^{\beta_1} p^{\beta m_2} \end{aligned}$$

where and γ_1 are γ_2 positive constants.

The first order conditions of the problem can be written as,

$$\begin{aligned} \frac{\delta \text{ Total income}}{\delta F} &= \beta_2^v \frac{V(p)}{p} p'_F + \beta_2^m \frac{M(F, p)}{p} p'_F + \quad [A1] \\ \beta_1 \frac{M(F, p)}{F} &= k \end{aligned}$$

The derivative of

$$p = \frac{\text{Total income}}{\text{Total income} - F - A}$$

with respect to F , holding Total Income constant, is

$$p'_F = \frac{p}{Total\ income - F - A} \quad [A.2]$$

Define

$$\eta_F = \left[\frac{\delta Total\ income}{\delta F} \times \frac{F}{Total\ income} \right]$$

as the elasticity of total income with respect to fundraising expenditures. Multiplying both sides of [A.1] by $F/Total\ Income$, and substituting p'_F according to [A.2], we obtain,

$$\eta_F = \left[\beta_2^v \frac{V(p)}{Total\ income} + \beta_2^m \frac{M(F, p)}{Total\ income} \right] \times \frac{F}{Total\ income - F - A} + \beta_1 \frac{M(F, p)}{Total\ income} = k \frac{F}{Total\ income}$$

Finally,

$$k = \frac{\eta_F}{F/Total\ income}$$

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Resumen

El trabajo contiene un análisis empírico de los determinantes de las donaciones de tiempo y dinero a las Organizaciones No Gubernamentales Españolas de Ayuda al Desarrollo. Este análisis se basa en un modelo inspirado en la teoría de la competencia monopolística, a partir del cual se obtiene que los gastos de promoción y el precio son variables endógenos y deben ser tratadas como tales en la estimación econométrica. Los resultados obtenidos indican que el donante medio de tiempo es diferente en sus preferencias del donante medio del dinero y que las preferencias del gobierno difieren de las del donante privado. También se detectan evidencias parciales de complementariedad entre donaciones de tiempo y dinero, si bien las donaciones de tiempo y los ingresos monetarios totales (dinero privado y subsidios gubernamentales) no muestran asociación estadística alguna.

Keywords: Organizaciones no lucrativas, contribuciones voluntarias, trabajo voluntario, competencia monopolística.

Recepción del original, mayo de 1997

Versión final, febrero de 1999