

Nunnenkamp, Peter; Öhler, Hannes; Schwörer, Tillmann

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by Peter Nunnenkamp,
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US based NGOs in International Development Cooperation: Survival of the Fittest?*

Peter Nunnenkamp, Hannes Öhler and Tillmann Schwörer

Abstract:

The non-distribution constraint of non-governmental organizations (NGOs) would be harder, and financiers as well as recipients could expect more charitable output from them, if less efficient NGOs were squeezed out of international development cooperation. We employ Probit and complementary log-log estimations to analyze which factors determine the probability of “market” exit for almost 900 US based NGOs with overseas aid activities during the 1984-2003 period. Apart from their size and experience, we consider administrative overheads as an important aspect of NGO efficiency. We also account for other dimensions of NGO heterogeneity, including the importance of official refinancing. We find that larger administrative overheads increase the probability of exit for secular NGOs, though not for religious NGOs. Furthermore, we detect complex non-linear effects once the interactions between administrative overheads and official refinancing are taken into account.

Keywords: non-governmental organizations, foreign aid, NGO characteristics, market exit, Probit models, complementary log-log.

JEL classification: L31; F35

Peter Nunnenkamp

Kiel Institute for the World Economy
Hindenburgufer 66
D-24105 Kiel, Germany
phone: +49-431-8814209
E-mail:

peter.nunnenkamp@ifw-kiel.de

Hannes Öhler

Georg-August University Goettingen
Platz der Goettinger Sieben 3
D-37073 Goettingen, Germany
phone: +49 551 39 10782
E-mail:

hoehler@uni-goettingen.de

Tillmann Schwörer

Kiel Institute for the World Economy
Hindenburgufer 66
D-24105 Kiel, Germany
phone: +49-431-8814573
E-mail:

tillmann.schwoerer@ifw-kiel.de

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1. Introduction

Non-governmental organizations (NGOs) play a major role in international development cooperation, particularly for foreign aid from the United States (McCleary and Barro 2008). NGOs are widely believed to be more efficient than official agencies in delivering foreign aid to the poor and needy in recipient countries (e.g., McCoskey 2009). However, the relative importance of expenses that are not directly associated with charitable activity and overseas aid projects varies widely among NGOs. For instance, the share of expenses for administration and management ranges from zero to about half of the overall budget within the sample of US based NGOs used by Nunnenkamp and Öhler (2010). This raises the question of whether less efficient NGOs are more likely to exit the “foreign aid market” than their more efficient peers.

The answer to this question is highly relevant for the NGOs themselves, the private and official financiers of NGOs, and the aid receiving countries. The aid recipients are interested in higher and sustained project-related spending on the ground. The predictable amount of project financing would tend to be higher if more efficient NGOs survived, while less efficient NGOs left the market.¹ Private donors dislike NGOs spending heavily on administration and fundraising, i.e., items implying a higher ‘price of giving’ (e.g., Khanna and Sandler 2000).² Consequently, it would be reassuring for private donors to know that relatively inefficient NGOs were squeezed out of the market even if individual donors do not engage in systematic screening of various NGOs.³ Compared to private donors, official aid agencies should find it easier to screen the NGOs and allocate funding accordingly. However, official refinancing could weaken the link between NGO efficiency and market exit if NGOs anticipated that waste will not be effectively sanctioned by the principals due to bureaucratic slack. Finally, the exit threat is clearly relevant for the NGO themselves as it might reduce or even prevent so-called perquisite consumption. Unless NGO staff is purely altruistic, it may be tempted to divert part of the funds away from overseas aid projects to headquarter facilities, travel and similar perks. The exit threat could strengthen the non-distribution constraint according to which NGOs are not allowed to generate profits and disburse them to owners, managers and staff (Hansmann 1980).

¹ Arguably, aid recipients may prefer the survival of both efficient and inefficient NGOs. Overall resources for development may decline if surviving NGOs do not attract the private donations and official funding previously absorbed by exiting NGOs. While we do not capture the redirection of funding to surviving NGOs in the present paper, we show in Section 3 that exit probabilities reach 8-11 per cent in some subgroups of NGOs.

² In other words, private donors are expected to prefer NGOs with a stronger development orientation. Ribar and Wilhelm (2002: 400) use the term “efficiency price of NGO aid,” defined as the “reciprocal of the share of service expenditures (total expenditures less fund-raising and administrative expenses) in total expenditures.”

³ Nunnenkamp and Öhler (2011) find that donors hardly make use of publicly available information on NGO characteristics, notably the ‘price of giving’ and the degree of specialization, when deciding on donations.

Data on the expenditure and revenue patterns of NGOs engaged in international development cooperation are notoriously scarce. This applies all the more so when sufficiently long time series are required to assess the sustainability of NGO operations. The database on US NGOs compiled by Rachel McCleary provides a major exception, however. For the 1984-2003 period under consideration here, this database covers almost 900 NGOs. We employ these data in Probit and complementary log-log model estimations to assess whether NGOs with a higher efficiency price of aid are more likely to discontinue international development cooperation than more efficient peers. We control for other aspects of NGO heterogeneity, including the size and age as well as the type of NGOs. Furthermore, we account for their funding structure. By interacting the efficiency price of aid with funding from official sources we are able to identify, *inter alia*, whether inefficient NGOs could survive more easily when having access to public refinancing. In addition to NGO-specific characteristics, we consider “market” characteristics such as the density and concentration of NGO operations.

Section 2 portrays the analytical background and specifies the hypotheses. In Section 3, we describe the data and introduce our estimation strategy. Empirical results are presented in Section 4. We conclude in Section 5.

2. Analytical background and hypotheses

To the best of our knowledge, the present study is the first to provide an empirical assessment of the links between the efficiency and survival of NGOs in international development cooperation. However, our analysis clearly relates to well-developed strands of the literature. In particular, we draw on the theoretical and empirical insights from the rich literature on the determinants of exit and survival in industries dominated by profit-oriented firms.

The model of industry dynamics presented by Jovanovic (1982) provides an important theoretical foundation by generating patterns of growth and failure for profit-oriented firms. Firms are assumed to be heterogeneous with respect to efficiency and cost levels. Firms do not know about their ‘true’ efficiency when starting operations, but collect relevant information over the course of time. The size and age of a firm represent two critical characteristics from which its efficiency can be inferred: “Efficient firms grow and survive; inefficient firms decline and fail” (Jovanovic 1982: 649).⁴ In other words, firms differ in size because some of them discover in the process of ‘noisy’ selection that they are more efficient than others. Age matters as the firm’s uncertainty about its efficiency declines with the number of signals providing cost-related information.

⁴ See also Zingales (1998) on why size may be a proxy for efficiency.

The selection model predicts that larger and more experienced firms are less likely to exit the market. Such firms have received favorable cost information in the past (which allowed them to grow) and gained a more precise view of their ‘true’ efficiency so that additional cost information in the future is less likely to be unfavorable enough to trigger exit (Dunne et al. 1989: 679). By contrast, unfavorable cost signals prevent firms from becoming large and drive them out of the market as soon as the outside option of liquidation appears to be superior to continuing operations.

Harrison and Laincz (2008) present a modified version of Jovanovic’s model of industry dynamics for non-profits. These authors incorporate two defining features of non-profits into the selection model: the non-distribution constraint and altruism.⁵ Both features have the effect that the exit rates of non-profits are systematically lower than the exit rates of profit maximizers. Altruism acts like a subsidy on output; i.e., an altruistic NGO manager decides on output as if the NGO had lower effective costs. Conversely, for any given level of cost or efficiency, a profit maximizing firm is more likely to exit the market than the altruistic NGO. This is all the more so when the non-distribution constraint is taken into account. The non-distribution constraint implies a lower liquidation value of NGOs, compared to profit-oriented firms whose assets could be sold and distributed upon exit. Consequently, non-profits tend to incur higher costs than profit maximizers until the outside option becomes more favorable than continuing operations.

Importantly, the theoretical predictions of Jovanovic’s (1982) model on the role of firm size and age for the probability of market exit carry over to the case of non-profits, even though their defining features result in systematically higher survival rates compared to profit maximizers. The comparison of non-profits and profit maximizers is of principal interest in studies of “mixed” industries such as Deily et al.’s (2000) analysis of different types of ownership of hospitals (non-profits, for-profits and government-run) in the United States. By contrast, our focus is on the heterogeneity among NGOs in international development cooperation.⁶ As stressed by Lakdawalla and Philipson (2006) as well as Harrison and Laincz (2008), the survival and exit of non-profits can be modeled as by Jovanovic (1982) for profit-oriented firms. Specifically, the above noted reinterpretation of NGOs’ effective costs does not invalidate the reasoning that larger and more experienced market participants tend to be more efficient and, therefore, are less likely to exit than their peers. In research on organizational ecology, sociologists and political scientists have coined the notions of ‘liability of newness’ and ‘liability of smallness’ to stress the role of age and size for

⁵ Altruism weakens or removes the profit motive of NGO staff and managers. Hence, NGOs may be regarded as “profit-deviators” in the jargon of Lakdawalla and Philipson (2006).

⁶ It would be interesting to compare survival and exit between NGOs and profit-oriented contractors of official donor agencies as alternative aid channels. However, comparable data for profit-oriented contractors of USAID, for example, are not available to the best of our knowledge.

survival in different populations of organizations, including NGOs (e.g., Freeman et al. 1983; Twombly 2003; Wollebaek 2009).

The important role of firm size and age has been supported in empirical industry studies. Earlier analyses finding these firm characteristics to be positively associated with firm survival focus on manufacturing industries in the United States (e.g., Evans 1987; Dunne et al. 1989; Audretsch and Mahmood 1995). Similar results are reported for other countries, including Ireland (Görg and Strobl 2003), Portugal (Mata and Portugal 1994; 2002), and the United Kingdom (Disney et al. 2003).⁷ Likewise, size and age figure as key determinants of exit and survival in empirical studies on non-profits. Most of these studies analyze NGOs with local activities such as social services; examples include: Twombly (2003); Fernandez (2008); Harrison and Laincz (2008); and Wollebaek (2009). While NGOs engaged in international development cooperation have received only scant attention, we expect that the probability of exit decreases with the size and age of this type of NGO, too (*hypothesis 1*).

Refined measures of efficiency go beyond indirect proxies such as the size and age of firms and non-profits. Industry studies such as Zingales (1998) employ return on sales or assets, per-unit costs and technical efficiency (i.e., the estimated distance from the production possibility frontier) as additional or alternative measures of firm-level efficiency. Deily et al. (2000) assess the relative efficiency of specific ownership types of hospitals by using the residuals from estimations of a stochastic frontier cost function. Data limitations prevent us from employing such measures in the present context. Nevertheless, the database on NGOs in international development cooperation offers sufficient information to capture the so-called efficiency price of NGO aid. This frequently used concept considers NGO expenses for administration and fundraising to be unproductive in the sense that they are not (directly) related to the charitable activities of the NGO (e.g., Ribar and Wilhelm 2002; Castaneda et al. 2008; Aldashev and Verdier 2010). The higher the share of these expenses in total expenditures, the less efficient the NGO is supposed to be. We follow this literature and hypothesize that NGOs with higher unproductive expenses are more likely to exit international development cooperation (*hypothesis 2*). This does not necessarily imply, however, that administrative costs and fundraising resemble each other in reducing the probability of survival. The effect of fundraising is rather ambiguous to the extent that it helps mobilize additional financing.⁸

⁷ However, some empirical studies find more ambiguous effects of firm size on survival and exit; examples include Holmes et al. (2010) on micro-enterprises in the United Kingdom and Wagner (1994) on small German firms.

⁸ The distinction between mechanistic and organic NGO structures may qualify the expected effects of administrative costs, too. The reasoning of Wollebaek (2009: 272) implies that organic structures tend to be associated with less

The emphasis of recent studies often extends beyond the efficiency of firms and NGOs. Firm characteristics such as domestic versus foreign ownership and export orientation have received considerable attention as additional determinants of firm survival and market exit.⁹ The role of financing has been addressed for the survival of firms as well as non-profits. In a theoretical model, Clementi and Hopenhayn (2006) analyze the role of financing constraints on firm dynamics. These authors extend models such as Jovanovic (1982) by stressing the relevance of the structure of financing (i.e., by relaxing the Modigliani-Miller proposition). In addition to firm size and age, the model of Clementi and Hopenhayn (2006) predicts that the conditional probability of firm survival increases with equity financing. Likewise, Musso and Schiavo (2008) argue that it is more difficult for financially constrained firms to grow and to survive. Zingales (1998: 935) finds in an empirical study of the US trucking industry that “sometimes natural selection leads to the survival of relatively inefficient firms, which happen (or choose) to have deep pockets.” According to Görg and Spaliara (2009), financial health – proxied, inter alia, by a high ratio of equity to total assets and a low ratio of short-term debt to assets – is associated with better survival prospects for French and UK firms.

The dichotomy between equity and debt may play a minor role for non-profits compared to profit-oriented firms. Nevertheless, deep financial pockets and financial health may be related to the structure of financing in the case of NGOs in international development cooperation, too. Specifically, Harrison and Laincz (2008: 35) suspect that low exit rates of NGOs may result from “government grants keeping inefficient charities alive” (*hypothesis 3*). Fernandez (2008) also expects reliable and predictable government funding to improve the chances of NGO survival, even though it may erode the legitimacy of NGOs among private donors.¹⁰ On the other hand, government funding may be associated with better monitoring of NGOs which, in turn, might increase the probability of exit by exposing inefficiency. To the best of our knowledge, this hypothesis has not been addressed so far in the empirical literature on internationally active NGOs.

Finally, market exit may depend not only on firm-specific or NGO-specific characteristics but also on the competitive environment in which firms and NGOs operate. The density of organizations in a particular market and the concentration of resources in the largest organizations have received most attention in this context. For instance, Twombly (2003: 217-8) argues that “a

administrative costs due to low levels of formalization. All the same, this author expects that “a strongly organic structure is generally a liability for the survival of local voluntary associations.”

⁹ See, for instance, Mata and Portugal (2002), Görg and Strobl (2003), Bernard and Jensen (2007), Görg and Spaliara (2009), Holmes et al. (2010), and Bandick (2010).

¹⁰ However, private donors may react positively if government funding is regarded as a signal of official approval of the NGO and the urgency of its social cause. Indeed, empirical evidence on government funding of NGOs having negative effects on private donations (crowding out) is weak at best (e.g., Ribar and Wilhelm 2002).

central tenet of the population ecology theory is the degree of competition among groups that exists within systems,” and he expects that available “resources may be insufficient to sustain organizations when faced with many competitors.”¹¹ All the same, exits may be relatively frequent in the early stages of market development as long as the legitimacy of the still small population of organizations is rather weak (Fernandez 2008; Wollebaek 2009). In other words, the probability of exit may fall from a relatively high level before rising again when the population of organizations has become sufficiently large so that competition effects are likely to dominate the process of building legitimacy. Considering that most areas of international development cooperation are unlikely to suffer from insufficient legitimacy, we expect exits to be positively associated with the density of NGOs (*hypothesis 4*).¹² The density measure should be lower when market consolidation has taken place already. At the same time, resource concentration could be higher in consolidated markets. Exits might therefore become less likely with increasing resource concentration.

3. Data and method

We make use of the extensive database compiled by Rachel McCleary on US based NGOs with activities in international development cooperation in order to assess the hypotheses introduced in the previous section. The database offers annual information of major revenue and expenditures items that the NGOs are required to report when they register with the United States Agency for International Development (USAID). In the present context, the most relevant items include:

- total expenditures as a measure of NGO size, including both international and domestic activities;¹³
- the year in which the NGO registered with USAID, serving as our proxy of its experience in international development cooperation;¹⁴
- the costs for administration and management as well as the expenses for fundraising: higher shares of these two expenditure items in total expenditures are supposed to reveal relatively inefficient NGOs in terms of higher non-charitable spending;
- the financing structure of NGOs, notably the availability of public funds (from USAID and other public sources) and private donations.¹⁵

¹¹ A similar line of reasoning can be found in studies on firm survival (e.g., Bandick 2010).

¹² By contrast, Wollebaek (2009: 271) expects “legitimation effects to be more prevalent than competition effects” with respect to the survival of local NGOs in Norway.

¹³ The share of international activities is reported, too. We use this share as a control variable below.

¹⁴ Alternatively, we consider the founding year of the NGO.

¹⁵ The NGOs’ own resources raised, for example, through commercial activities (sales, fees, etc.) represent the third major source of revenues.

The subsequent analysis covers 887 NGOs and the 1984-2003 period. We chose 1984 as the starting point as the database offers uninterrupted time series since then, while some earlier years are completely missing. While the database extends to 2005, we consider 2003 as the final year to identify exits within our NGO sample.

We define entry, exit and experience (age) of NGOs in international development cooperation based on their appearance and disappearance in the database. This is in line with Zingales (1998: 913) who assumes that a (trucking) firm exits when it disappears from the files of the American Trucking Association. Specifically, we define exits from international development cooperation as previously active NGOs that are no longer listed in the database in the current year and do not re-appear in the files throughout the remaining period of observation. We take into account that an NGO may fail to report the required balance-sheet information to USAID in a particular year, though still being active in international development cooperation. If an NGO re-appears in the database after just one missing year, we keep the NGO in the sample treating as missing only the year without reporting.¹⁶ By contrast, we drop those NGOs from the sample which re-appear in the database after more than one year.¹⁷

While the database provides detailed information on a broad spectrum of NGOs, it does not cover the universe of relevant NGOs. Sample selection bias cannot be ruled out, even though the bias is probably smaller than in previous studies on foreign aid granted by a limited set of NGOs.¹⁸ NGOs have to meet several conditions when they register with USAID.¹⁹ They have to be US based, solicit cash contributions from the US general public, and conduct overseas program activities that are consistent with the general purposes of the US Foreign Assistance Act and/ or Public Law 480. Furthermore, they must be exempt from federal income taxes under Section 501(C)(3) of the Internal Revenue Code. Registered NGOs must be incorporated for not less than 18 months and provide financial statements to the public upon request, in line with generally accepted accounting principles (GAAP). They have to register in order to become eligible to compete for specific types of funding, e.g., development and humanitarian assistance grants. This implies that NGOs relying exclusively on private donations and own resources are likely to be

¹⁶ This applies to about four per cent of the overall sample of NGOs. We provide a robustness test below by excluding such NGOs.

¹⁷ As a consequence, 76 NGOs are dropped from the sample.

¹⁸ For instance, Ribar and Wilhelm (2002) use a sample of 125 US based NGOs. Koch et al. (2009) assess aid allocation based on a sample of 61 NGOs based in different countries. The sample of about 300 Swiss NGOs used by Dreher et al. (2011) is relatively large, though still much smaller than the sample in the present paper.

¹⁹ For more details, see: http://www.usaid.gov/our_work/cross-cutting_programs/private_voluntary_cooperation/conditions_us_organizations.pdf (accessed: June 2011).

underrepresented in the registry.²⁰ A related concern is that the frequency of registrations with USAID might depend on the overall pool of public refinancing available to registered NGOs. Indeed, the annual amount of public funding of all NGOs is correlated positively with the number of annual entries into the database in the subsequent year ($\rho=0.39$). However, the correlation of public funding with the number of annual exits is also positive and even stronger ($\rho=0.62$). If exits – our dependent variable in the following – were driven by NGO reactions to the overall pool of public funds, one would expect the latter correlation to be negative or at least weaker than the former one.

Table 1 provides some preliminary indications on unconditional exit and survival probabilities. The overall NGO sample is classified into sub-groups in terms of major characteristics such as size, age, non-charitable (“unproductive”) expenditures, and financing structure. Some interesting patterns emerge that will be analyzed more systematically below. For instance, the exit probability appears to be relatively low for larger and older NGOs. The exit probability of NGOs with a particularly high share of administrative costs in total expenditures exceeds eight per cent, compared to 3-3.5 per cent for NGOs which keep administrative costs in check. Public funding seems to be associated with better chances of survival, though this effect may level off once a certain degree of public funding is available. Exits are more common among secular NGOs than among religious NGOs.

Our estimation approach follows various studies on firm survival and market exit, including Zingales (1998) and Görg and Spaliara (2009). We start with a Probit model to estimate the probability that US based NGOs discontinue activities in international development cooperation in a particular year, conditional on a set of possible determinants observed in the previous year. In other words, we assume that the probability of exit, $Pr(Exit_{i,t}=1)$, is a function of the vector of determinants, $\mathbf{X}_{i,t-1}$:

$$Pr(Exit_{i,t}=1) = F(\mathbf{X}_{i,t-1} \beta + \delta_j + \lambda_t + \varepsilon_{i,t}) \quad (1)$$

with slope parameters β , NGO type-specific fixed effects, δ_j , time fixed effects, λ_t , and a normally distributed error term $\varepsilon_{i,t}$.

In line with the hypotheses introduced in Section 2, the vector of determinants includes the age of the NGO (logged: *Age*) as well as major expenditure and revenue items. Total expenditures (logged) reflect the size of NGOs (*Size*). The effect of both *Age* and *Size* on $Pr(Exit_{i,t}=1)$ should be

²⁰ It should be noted, however, that the sample includes various NGO-year combinations with public funding equal to zero (27 per cent of all observations).

negative if more experienced and larger NGOs have better chances to survive. We also enter NGO size in squared terms ($Size*2$) to account for non-linear effects on $Pr(Exit_{i,t}=1)$. The shares of administrative expenses and fundraising expenses in total expenditures, $Adminsh$ and $Fundsh$, should have negative effects on $Pr(Exit_{i,t}=1)$ if NGO efficiency in terms of containing non-charitable expenses improves the chances of survival. The impact of NGO financing is captured by the shares of public funding, $Publicsh$, and private donations, $Donationsh$, in total revenue – with the NGOs’ own resources from commercial activity serving as the base (revenue) category. We control for the share of international activities, $Intfrac$, expecting that NGOs are less likely to discontinue international development cooperation when it accounts for a larger share in their program expenditures.²¹

In addition, we account for the competitive environment in which NGOs operate (*hypothesis 4*). The density of NGOs in a particular “market” is proxied by the number of NGOs of a specific type ($NGOdensity$). The classification of NGOs into religious and secular types is also available from McCleary’s database. Religious NGOs are subdivided into several faith-based groups such as Evangelical, Catholic and Jewish. Secular NGOs are differentiated further according to the area of main activity such as education, health, infrastructure, or human rights.²² The concentration of resources – in terms of revenues – within these sub-groups is measured by Herfindahl indices ($Herfin$). The regressors are measured at time $t-1$ to mitigate endogeneity concerns.²³ Finally, we account for NGO type-specific fixed effects, δ_j , based on the above classification, as well as time fixed effects, λ_t .

In subsequent steps of the analysis, the baseline Probit model is modified in several ways (see Section 4 for details). First, we replicate the estimations for major sub-groups of the overall NGO sample. Notably, we separate between religious and secular NGOs. The structure of financing differs considerably between these two groups. Secular NGOs depend more strongly on public funding (31 per cent, compared to only 12 per cent for religious NGOs), and also on own resources from commercial activities, fees, etc. (15 versus 10 per cent). Second, we extend the specification by interaction terms. In particular, we are interested to evaluate in this way whether the effects of NGO efficiency in terms of $Adminsh$ depend on the NGO’s reliance on public funding ($Publicsh$) as well as its size. The interaction with $Publicsh$ could reveal whether the effects of NGO inefficiency

²¹ For detailed definitions, see Appendix A. Summary statistics are provided in Appendix B. It should be noted that we excluded some outliers (the highest percentile of NGO-year combinations) with extremely high shares of administrative costs and expenses for fundraising in total expenditures. After careful inspection of the data, it appears that these outliers are concentrated in the first year when NGOs register with USAID; charitable expenses are often still minor (or even zero) in the first year, resulting in exceptionally high values of $Adminsh$ and $Fundsh$.

²² Note that we combined some very small sub-groups (with specific religious affiliations and areas of activity) when no exit was observed for a particular sub-group. In this way, we avoided the loss of observations.

²³ See also below on IV Probit model results.

on the probability of exit weaken when NGOs have easier recourse to official financiers, or whether monitoring of NGOs by official financiers even strengthens this link.

Third, we employ complementary log-log (cloglog) estimations in order to test for the robustness of our results to methodological choices. The cloglog model is the discrete time version of the Cox proportional hazard model.²⁴ We prefer the Probit model as a benchmark, however, since the assumption of proportional hazards has been shown to be restrictive and empirically questionable (Hess and Persson, 2010). Fourth, we take into account that some of our explanatory variables may be endogenous. Hence, we follow Wooldridge (2002) and use the instrumental variable technique for Probit models (see also Görg and Spaliara 2009).

4. Empirical results

Basic Probit estimations

Table 2 presents the coefficients of the baseline estimations of our Probit model. All estimations reported here and in the subsequent tables include year fixed effects as well as fixed effects for specific sub-groups of NGOs (for details, see Section 3). Standard errors are clustered at the NGO level. In column (1) of Table 2, we consider only the size and age of the US based NGOs, i.e., the two proxies that the earlier literature on firm survival widely used to capture cost efficiency and experience. Indeed, we find support for *hypothesis 1* introduced in Section 2: Both measures enter with a significantly negative coefficient, at the one per cent level of significance.²⁵ This implies that larger and more experienced NGOs in our sample are more likely to continue their activities in international development cooperation than smaller and younger NGOs. Quantitatively speaking, the (unreported) marginal effects at the mean of the variables suggest that the exit probability decreases by 1.1 (0.8) per cent with an increase of size (age) by one per cent.

In columns (2) and (3), we consider our two measures of unproductive expenses in addition to the size and age of NGOs in order to assess *hypothesis 2* that NGOs with a higher efficiency price of NGO aid – i.e., spending relatively less on charitable activities – are more likely to exit international development cooperation. In line with this hypothesis, the coefficient of *Adminsh* proves to be significantly positive at the one per cent level. The marginal effect corresponding to

²⁴ Studies on firm exit often employ Cox proportional hazard models. However, the cloglog model is regarded as more appropriate than the Cox model when, as in the present case, the data are collected on an annual basis; see Musso and Schiavo (2008), Görg and Spaliara (2009), and Bandick (2010). Generally, proportional hazard models assume that explanatory variables have a multiplicative effect on the hazard.

²⁵ By contrast, the coefficient of *Age* turns out to be insignificant when the founding year, instead of the year of registration with USAID, is considered. This result also holds for the subsequent specifications. Throughout our analysis, however, the signs and significance levels of other coefficients are not affected by the applied definition of *Age*.

the coefficient shown in column (2) suggests that an increase in the share of administrative expenses in total expenditures by one standard deviation leads to an increase in the exit probability by 0.6 per cent. In contrast to *Adminsh*, *Fundsh* turns out to be insignificant at conventional levels of statistical significance. While both variables reveal unproductive expenses in the sense of not being directly related to charitable activities, the effect of fundraising could be expected to have ambiguous effects on exit and survival. Even though private donors may dislike NGOs engaging in “excessive” fundraising (Rose-Ackerman 1982), fundraising has often been found to result in higher donations which, in turn, may render exit less likely.²⁶ *Size* and *Age* keep their significantly negative coefficients, indicating that the extended specification compared to column (1) offers additional explanatory power with regard to NGO efficiency and the probability of exit.

Note that *Fundsh* is insignificant in columns (2) and (3), i.e., independently of how we deal with missing entries for fundraising. One option is to assume that fundraising expenses are zero whenever the costs for administration and management and the program-related expenditures add up to total expenditures of NGO *i* in year *t*. This assumption is underlying the estimation reported in column (3). Alternatively, we drop those NGO-year combinations (column 2). The latter option runs the risk of losing “true” zero observations when an NGO did not undertake any fundraising. Careful inspection of the data suggests, however, that fundraising is sometimes not reported. The zero assumption would then clearly be unwarranted. Fortunately, the choice between these two options hardly affects our results. The significance levels as well as the size of the coefficients for all variables are very similar in columns (2) and (3). In all subsequent estimations, we proceed with the more cautious option used in column (2).²⁷

In column (4) we refine the specification of the Probit model in three respects: We account for non-linear effects of the size of NGOs on exit and survival by adding the variable in squared terms (*Size*2*); we include *Donationsh* and *Publicsh* to assess the role of NGO financing; and we control for the international share of NGO activity (*Intfrac*). *Age* loses its significance in the extended specification in column (4).²⁸ The (positive) coefficient of *Size*2* also fails to pass conventional significance levels. However, Ai and Norton (2003) show that the significance levels of the coefficients of any kind of interaction terms (including squared terms) cannot be interpreted in non-linear models such as the present Probit model. Indeed, there is clear evidence for non-linear effects once the marginal effects are calculated conditional on the level of the variable *Size* itself.

²⁶ For a more detailed discussion and review of the relevant literature, see Nunnenkamp and Öhler (2011).

²⁷ As *Fundsh* turns out to be insignificant, we also performed estimations in which we dropped *Fundsh* completely. While these results are not shown in detail, we note the most relevant findings and differences in the subsequent text.

²⁸ In contrast, *Age* remains significant at the five per cent level when dropping *Fundsh*. On the other hand, *Publicsh* turns out to be insignificant at conventional levels in the unreported results without *Fundsh*.

Figure 1 reveals that the exit probability decreases considerably when NGOs at the lower end of the size distribution grow larger. This effect diminishes and eventually approaches zero when NGOs move up in the size distribution. Quantitatively, an increase by one per cent in size leads to a decrease in the exit probability by 5.7 per cent at the lower end of the distribution (1st percentile), to a decrease by 0.8 per cent at the median, and to a decrease by 0.1 per cent at the upper end of the distribution (99th percentile).

The evidence on the role of financing is mixed. A larger share of private donations in the NGOs' total revenues does not affect the probability of exit in a significant way.²⁹ In contrast, a higher share of public funding reduces the exit probability at the five per cent level of significance. Quantitatively, an increase by one standard deviation in the share of public funding reduces the exit probability by 0.8 per cent. This is in line with Fernandez (2008) who argues that reliable and predictable government funding improves the chances of NGO survival. However, it can not necessarily be inferred from this result that "government grants keeping *inefficient* charities alive" (Harrison and Laincz 2008: 35; emphasis added). We return to this issue below. The estimation in column (4) also shows – as expected – that NGOs are less likely to discontinue international development cooperation if it figures more prominently in their portfolio (*Intfrac*).

We further extend the specification by including two indicators on the competitive environment in which NGOs operate. The density of NGOs in a particular sub-group enters with a positive coefficient in column (5) of Table 2 – as one would expect when a larger number of market participants is associated with fiercer competition. However, *NGOdensity* does not pass conventional significance levels.³⁰ The concentration of resources turns out to be significantly negative at the five per cent level. As noted in Section 2, resources may be concentrated more strongly when market structures are consolidated so that further exits become less likely. Importantly, the inclusion of *NGOdensity* and *Herfin* does not affect previous results. The size and significance of all other coefficients are essentially the same when comparing columns (4) and (5). Previous results also hold when excluding those NGOs from the sample which re-appear in the database after one missing year, instead of treating as missing only the year without reporting (see Section 3; results not shown).

Secular versus religious NGOs

²⁹ As mentioned in Section 3, a higher share of private donations corresponds to a lower share the NGOs' own resources from commercial activity which represent the reference (revenue) category.

³⁰ *NGOdensity* proves to be significant at the ten per cent level, however, when dropping *Fundsh*.

In the next step of our analysis, we split the overall sample into secular and religious NGOs with activities in international development cooperation. This helps us identify different behavioral patterns between these two sub-samples with regard to hypotheses 1-4. The results of the sample split are reported in Table 3. There are some similarities between the two sub-samples when comparing the estimations in columns (1) and (4). In particular, both religious and secular NGOs are less likely to discontinue international development cooperation when they are larger (*Size*) and when overseas programs account for a larger share of total activity (*Intfrac*). Note that the non-linear effects of NGO size are also similar for both sub-groups, even though the coefficients of *Size* and *Size*2* are insignificant in the estimation for religious NGOs. In several respects, however, the estimations reveal striking differences between the two sub-samples.

The findings for the much larger sub-sample of secular NGOs closely resemble those for the overall sample shown before.³¹ A higher share of administrative costs increases the probability of exit for secular NGOs (*hypothesis 2*), while a higher share of public funding renders exit less likely for this sub-sample (*hypothesis 3*). The coefficient of *Adminsh* is positive for the smaller sub-sample of religious NGOs, too; but a larger administrative overhead does not increase the probability of exit in a significant way in columns (1)-(3). Higher expenses for fundraising even reduce the exit probability for religious NGOs at the one per cent level of significance. This is surprising as expenses for fundraising are widely considered to be as unproductive as administrative costs, in the sense of not being directly related to aid projects (Ribar and Wilhelm 2002; Aldashev and Verdier 2010). The considerably stronger reliance of religious NGOs on private donations, compared to secular NGOs, offers a possible explanation of this finding.³² Fundraising appears to be particularly important for religious NGOs to secure sustainable financing. With alternative sources of finance contributing relatively little to overall revenues, the survival of religious NGOs largely depends on mobilizing a sufficient amount of private donations through fundraising effort.

Religious NGOs also differ from secular NGOs insofar as the exit probability does not depend on the share of public funding. Once again, the particular financing structure may help explain the insignificance of *Publicsh* in columns (1)-(3) of Table 3. As noted in Section 3, public funding accounts for just 12 per cent of total revenues of religious NGOs. This share might have been too small to have a significant effect on the exit probability of religious NGOs.

Interaction terms and non-linear effects

³¹ The only exception is that *Age* turns out to be significant, though only at the ten per cent level, for secular NGOs, whereas NGO experience did not play a significant role for the full sample in columns (4) and (5) of Table 2.

³² Private donations contribute almost 80 per cent, on average, to overall revenues of religious NGOs; see also Section 3.

In Table 4, we return to the full sample of (secular and religious) NGOs. The Probit estimations reported in columns (2) and (4) account for interactions between *Adminsh* and public NGO funding. We refer to *Publicsh* as our standard measure of public funding in columns (1) and (2), while we replace *Publicsh* by a dummy variable set equal to one whenever an NGO receives public funding, irrespective of its share in total funding, in columns (3) and (4) (*PublicD*). Comparing the results between columns (1) and (2) and, respectively, between columns (3) and (4), it can be seen that the extension by the interaction terms hardly affects the coefficients of our standard regressors.

As concerns the coefficients of the interaction terms, we noted already that their significance cannot be interpreted in non-linear models (Ai and Norton 2003). Instead, we portray the marginal effect of *Adminsh* conditional on *Publicsh* in Figure 2, and the marginal effect of *Adminsh* conditional on *PublicD* in Figure 3. Taking the evidence in both figures together points to fairly complex non-linear effects of administrative expenditures on the probability of exit. While we found before that the exit probability increases with higher administrative expenditures, Figure 3 suggests that this only applies to the sub-sample with public funding (*PublicD* = 1). In contrast, the exit probability is essentially the same across the whole spectrum of *Adminsh* for the sub-sample without any public funding (*PublicD* = 0). While the effects of *Adminsh* depend on whether or not NGOs rely on public funds, they hardly depend on the relative importance of public funding as reflected in *Publicsh*. According to Figure 2, the marginal effect of *Adminsh* on the exit probability is significantly positive for all values of *Publicsh* of up to almost 70 per cent. The effect loses significance beyond this threshold, i.e., for about ten per cent of all observations.

The non-linearities revealed in Figures 2 and 3 may be explained as follows. It can reasonably be assumed that mainly the official financiers engage in monitoring of NGOs.³³ Inefficiency is thus more likely to be exposed in case of NGOs with public funding, and official financiers may put pressure on NGOs with larger administrative overhead to exit international development cooperation. As a matter of fact, USAID registration conditions require that NGOs do “not expend more than 40 percent of total expenses on supporting services.”³⁴ This leaves the question of why official monitoring does not appear to be particularly effective beyond the threshold of *Publicsh* in Figure 2. A possible explanation could be that both *Adminsh* and *Publicsh* are relatively high when NGOs just entered international development cooperation. While program activities as well as alternative sources of financing have still to be developed, official financiers may provide feed money – instead of insisting on administratively efficient operations immediately

³³ Nunnenkamp and Öhler (2011) show that private donors hardly make use of publicly available information on the administrative efficiency of NGOs when deciding on donations.

³⁴ See: http://www.usaid.gov/our_work/cross-cutting_programs/private_voluntary_cooperation/conditions_us_organizations.pdf (accessed: June 2011).

after entry already. Another explanation is that *Publicsh* exceeds 70 per cent for some fairly large NGOs in the sample. Similar to the “too big to fail”-argument in banking and finance, the threat of official financiers to enforce the exit of large and inefficient NGOs from international development cooperation may lack credibility.

The marginal effect of *Adminsh* conditional on *Size* in Figure 4, derived from the estimation in column (5) of Table 4, fits into this pattern. As can be seen, the effect of *Adminsh* on the exit probability is significantly positive over the broad middle range of the size distribution. However, the effect loses significance at both ends of the size distribution. At the lower end, NGOs may not only be relatively small but also relatively new and inexperienced in international development cooperation. They may incur relatively high administrative costs during the initial phase of developing program activities. Probably, they await additional information indicating whether they are likely to grow and become more efficient before they decide on exit. At the opposite end, the largest NGOs may be tempted to avoid exit especially when private as well as official tolerate administrative inefficiency.

Table 5 addresses non-linearities with regard to age and experience more systematically. Once again, the standard regressors (replicated in column 1) are hardly affected when considering different age groups in column (2) or splines in column (3). In column (2), the youngest NGO group represents the reference category.³⁵ Relative to the other age groups, the exit probability proves to be significantly higher (at the one per cent level) for the second group (3-5 years). In column (3) we replace the *Age* group dummies with natural cubic splines as suggested by Beck et al. (1998). In this way we additionally capture non-linearities within intervals of the age distribution.³⁶ The graphical representation in Figure 5 indicates that the exit probability decreases with age and experience after an initial peak at the lower end of the age distribution. This closely resembles the results from the estimation with the different age groups. Hence, it is no longer surprising that *Age* proves to be insignificant when entered in linear form (column 1).

Finally, the estimations reported in columns (4) and (5) of Table 5 point to strongly non-linear effects of the NGOs’ administrative overhead on the probability of exit. Instead of using the continuous definition of *Adminsh*, we classify all observations into five equally large sub-groups with increasing values of *Adminsh*. The lowest quintile represents the reference category, and a

³⁵ The five age groups are defined as follows: less or equal than 2 years, 3-5 years, 6-10 years, 11-20 years, and more than 20 years.

³⁶ We define five age intervals, divided by four so-called knots. The knots are located at the percentiles recommended in Harrell Jr. (2001: 23), i.e. the percentiles 5, 35, 65 and 95. The five age intervals translate into three spline parameters. From the estimates of these splines we can recover the non-linear effects of age on the exit probability. In principle, these non-linearities could also be captured by using a complete set of age dummies. However, we prefer splines, since we are losing less degrees of freedom and since the resulting representation of the non-linear effect of age on the exit probability is smooth.

dummy variable is set equal to one for each of the remaining four quintiles. Surprisingly, three out of four dummy variables prove to be insignificant at conventional levels. *Adminsh* offers additional information beyond the traditional proxies of size and age only for the highest quintile with particularly large administrative overhead. Our standard regressors are robust to this modification, too.

Alternative models

In Table 6 we employ complementary log-log (cloglog) estimations in order to test for the robustness of our results to methodological choices. The cloglog model is the discrete time version of the Cox proportional hazard model and is widely regarded as appropriate when using annual data (Musso and Schiavo 2008; Görg and Spaliara 2009; Bandick 2010), even though the assumption of proportional hazards may be questionable (Hess and Persson 2010). We also take into account that some of our explanatory variables may be endogenous. Hence, we follow Wooldridge (2002) and use the instrumental variable technique for Probit models (see also Görg and Spaliara 2009). We re-estimate three specifications of our basic Probit model for each cloglog (columns 1-3) and IV Probit (columns 4-6).

Comparing the cloglog estimation in column (1) with the corresponding Probit estimation in column (2) of Table 2, the sign and significance of all coefficients is exactly the same and the size of the marginal effects is also similar (not shown). Likewise, the results for the extended cloglog specifications in columns (2) and (3) are very close to those of the corresponding Probit specifications in columns (4) and (5) in Table 2. The only exception is that the coefficient of *Size* is no longer significant for the cloglog estimations. As discussed before, however, this is irrelevant for the marginal effect of NGO size on the probability of exit.

In contrast to cloglog, some results are affected when employing IV Probit. We use as instruments the level of *Size*, *Size*2*, *Fundsh*, *Adminsh*, *Donationsh*, *Publicsh* and *Intfrac*, all lagged by two and three periods. Most notably, the coefficients of *Adminsh* are no longer significant when accounting for possible endogeneity of our regressors. Importantly, this does not imply that NGO efficiency becomes irrelevant for the probability of exit. Size effects are hardly affected by employing IV Probit. Furthermore, it appears that the second traditional proxy of efficiency, *Age*, now captures part of the effect previously attributed to *Adminsh*.³⁷ Note also that the coefficient of *Age* remains significant at the one per cent level when extending the specification of the IV Probit

³⁷ However, *Adminsh* regains statistical significance at the ten per cent level when *Fundsh* is excluded from the specification in column (4) of Table 6 (not shown).

model in columns (5) and (6), which is in striking contrast to the corresponding Probit specifications in Table 2.

The impact of the financing structure of NGOs and that of market characteristics on the probability of exit is affected only modestly when running IV Probit estimations, instead of the Probit estimations in Table 2. The significance of *Publicsh* weakens to the ten per cent level. The same applies to the negative coefficient of *Herfin*, reflecting the concentration of NGO resources in the relevant market. On the other hand, the degree of competition among NGOs in the relevant market, reflected by *NGOdensity*, turns out to be significant (at the ten per cent level) in column (4) of Table 6, in contrast to Table 2 above. Most importantly perhaps, there appears to be little reason to be concerned about the endogeneity of our regressors. The Wald tests indicate that exogeneity of the regressors cannot be rejected. Consequently we tend to prefer the previous Probit results, while it is reassuring to find them to be robust to the choice of alternative models.

5. Summary and conclusion

The recipients of NGO aid are interested in high and sustained project-related spending on the ground. Likewise, private donors dislike NGOs spending heavily on administration, management and fundraising. All the same, private donors do not appear to engage in effective screening of NGOs when deciding on where to donate (Nunnenkamp and Öhler 2011). Official financiers may be better prepared to monitor spending patterns of NGOs. On the other hand, the non-distribution constraint of NGOs may be weakened if public funding is readily available. Hence, it is far from guaranteed that more efficient NGOs are more likely to survive in international development cooperation than their less efficient peers.

We employ Probit and complementary log-log estimations to analyze which factors determine the probability of “market” exit for almost 900 US based NGOs with overseas aid activities during the 1984-2003 period. To the best of our knowledge, the present study is the first to provide an empirical assessment of the links between the efficiency and survival of NGOs in international development cooperation. In addition to more traditional proxies of efficiency such as size and experience, we account for administrative overheads and fundraising as unproductive expenditures resulting in a higher efficiency price of NGO aid. We also consider other aspects of NGO heterogeneity such as their financing structure (notably, the role of public refinancing) as well as their type and field of activity. We control for market characteristics such as the density of NGO operations and the concentration of resources.

We tend to support the hypothesis on the liability of smallness and newness. The effects of NGO size on the probability of exit are more robust to extensions of the estimation equation than

the effects of their age. Size and age have in common that the effects are non-linear. For instance, the exit probability decreases considerably when NGOs at the lower end of the size distribution grow larger, while this effect diminishes and eventually approaches zero when NGOs move up in the size distribution.

Unproductive expenditures for fundraising do not threaten NGO survival in international development cooperation. In contrast, NGOs with a larger administrative overhead are more likely to exit. This applies to secular NGOs, though not to religious NGOs. Moreover, NGO survival appears to be threatened only when administrative overheads are particularly large. Secular and religious NGOs also differ in that official funding reduces the exit probability for the former, but not for the latter. It cannot be inferred that public funding keeps inefficient (secular) NGOs alive. To the contrary, it is only for publicly refinanced NGOs that administrative inefficiency is associated with a higher probability of exit.

Although we find some indications that more efficient NGOs are less likely to exit international development cooperation, the governance and monitoring of NGOs appears to be insufficient to ensure the survival of the fittest. Arguably, the predominance of private donations – in particular with a large number of small donors – weakens the incentive for effective monitoring of religious NGOs in the United States. Further analyses of religious NGOs from countries where official refinancing is more common could provide deeper insights in this respect. However, the monitoring of NGOs by official financiers might also be improved. It may help the survival of the fittest if official financiers applied stricter rules and intensified the monitoring in line with the NGOs' reliance on official funds. Governance and monitoring problems may be most difficult to overcome in the case of large, though inefficient NGOs. On the one hand, such NGOs may be tempted to avoid exit as long as private and official donors tolerate administrative inefficiency. On the other hand, effective monitoring may suffer from insufficient credibility once NGOs have grown “too big to fail.”

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Table 1: Exit and survival probabilities: stylized facts (overall sample of 887 NGOs)

NGO characteristic	Range of indicator	Survival probability	Exit probability
Size (total expenditures)	Smallest	89.1	10.9
	Lower-middle	95.1	4.9
	Upper-middle	96.9	3.1
	Largest	98.5	1.5
Age (since entry in USAID registry)	Youngest	92.9	7.1
	Young	90.3	9.7
	Middle	94.8	5.2
	Old	96.3	3.7
	Oldest	97.9	2.1
Administrative costs (share in total expenditures)	Lowest	96.5	3.5
	Low	96.9	3.1
	Middle	95.1	4.9
	High	95.6	4.4
	Highest	92.0	8.1
Fundraising expenses (share in total expenditures)	Lowest	95.8	4.2
	Low	95.5	4.5
	Middle	96.0	4.0
	High	96.2	3.8
	Highest	94.9	5.1
Public funding (share in total revenue)	Lowest	92.2	7.9
	Lower-middle	96.6	3.4
	Upper-middle	96.3	3.8
	Highest	96.0	4.0
Type	Secular	94.0	6.0
	Religious	95.2	4.9

Table 2: Baseline Probit estimations

Variables	(1) Probit	(2) Probit	(3) Probit	(4) Probit	(5) Probit
Size	-0.1404*** (0.0139)	-0.1421*** (0.0224)	-0.1343*** (0.0153)	-0.4143** (0.1807)	-0.4291** (0.1887)
Size*2				0.0087 (0.0063)	0.0092 (0.0066)
Age	-0.0990*** (0.0335)	-0.1226*** (0.0431)	-0.1160*** (0.0348)	-0.0709 (0.0442)	-0.0605 (0.0444)
Fundsh		-0.0002 (0.0072)	-0.0011 (0.0062)	-0.0076 (0.0073)	-0.0081 (0.0073)
Adminsh		0.0122*** (0.0041)	0.0090*** (0.0031)	0.0101** (0.0042)	0.0107** (0.0042)
Donationsh				-0.0010 (0.0018)	-0.0009 (0.0018)
Publicsh				-0.0051** (0.0022)	-0.0051** (0.0022)
Intfrac				-0.0055*** (0.0013)	-0.0055*** (0.0012)
NGOdensity					0.0062 (0.0050)
Herfin					-0.0097** (0.0042)
Constant	0.2142 (0.3362)	-0.0723 (0.5550)	0.0600 (0.3573)	2.5181* (1.3698)	3.0703** (1.4118)
Observations	5,949	4,319	5,673	4,316	4,316

Notes: Reports the coefficients; for marginal effects, see the text. All estimations include year fixed effects as well as NGO-type fixed effects that are not shown. Standard errors are clustered at the NGO level. *** (**; *) denote significance at the one (five; ten) per cent level.

Table 3: Probit estimations: sample split, religious vs. secular NGOs

Variables	Religious NGOs			Secular NGOs		
	(1) Probit	(2) Probit	(3) Probit	(4) Probit	(5) Probit	(6) Probit
Size	-0.2573*** (0.0413)	-0.5785 (0.3826)	-0.6012 (0.3827)	-0.1474*** (0.0267)	-0.3889* (0.1992)	-0.3796* (0.2014)
Size*2		0.0112 (0.0134)	0.0120 (0.0134)		0.0086 (0.0069)	0.0082 (0.0070)
Age	0.0392 (0.0866)	0.0257 (0.0877)	0.0263 (0.0872)	-0.0969* (0.0510)	-0.0960* (0.0506)	-0.0845* (0.0514)
Fundsh	-0.0395*** (0.0141)	-0.0394*** (0.0139)	-0.0395*** (0.0140)	0.0023 (0.0086)	0.0012 (0.0085)	0.0009 (0.0086)
Adminsh	0.0062 (0.0087)	0.0065 (0.0087)	0.0070 (0.0087)	0.0108** (0.0048)	0.0110** (0.0049)	0.0116** (0.0049)
Donationsh	0.0068 (0.0043)	0.0071* (0.0042)	0.0068 (0.0042)	-0.0023 (0.0021)	-0.0021 (0.0021)	-0.0019 (0.0020)
Publicsh	0.0021 (0.0061)	0.0027 (0.0059)	0.0023 (0.0058)	-0.0061** (0.0024)	-0.0060** (0.0024)	-0.0059** (0.0024)
Intfrac	-0.0091*** (0.0027)	-0.0089*** (0.0027)	-0.0089*** (0.0027)	-0.0046*** (0.0014)	-0.0046*** (0.0014)	-0.0046*** (0.0014)
NGOdensity			0.0020 (0.0071)			0.0101 (0.0088)
Herfin			-0.0034 (0.0063)			-0.0130*** (0.0047)
Constant	1.5614* (0.9469)	3.8540 (2.8182)	4.2336 (2.7296)	1.1342** (0.5562)	2.7810* (1.4626)	3.2149** (1.4928)
Observations	1,169	1,169	1,169	3,029	3,029	3,029

Notes: Reports the coefficients; for marginal effects, see the text. All estimations include year fixed effects as well as NGO-type fixed effects that are not shown. Standard errors are clustered at the NGO level. *** (**; *) denote significance at the one (five; ten) per cent level.

Table 4: Probit estimations, including interaction terms

Variables	(1) Probit	(2) Probit	(3) Probit	(4) Probit	(5) Probit
Size	-0.4291** (0.1887)	-0.4331** (0.1876)	-0.4307** (0.1884)	-0.4767*** (0.1814)	-0.4786*** (0.1809)
Size*2	0.0092 (0.0066)	0.0093 (0.0066)	0.0096 (0.0066)	0.0112* (0.0064)	0.0104 (0.0063)
Age	-0.0605 (0.0444)	-0.0598 (0.0445)	-0.0524 (0.0453)	-0.0471 (0.0459)	-0.0619 (0.0444)
Fundsh	-0.0081 (0.0073)	-0.0079 (0.0073)	-0.0071 (0.0073)	-0.0058 (0.0073)	-0.0089 (0.0272)
Adminsh	0.0107** (0.0042)	0.0095** (0.0048)	0.0110*** (0.0042)	-0.0021 (0.0060)	-0.0078 (0.0073)
Donationsh	-0.0009 (0.0018)	-0.0009 (0.0018)	0.0012 (0.0015)	0.0013 (0.0015)	-0.0007 (0.0018)
Publicsh	-0.0051** (0.0022)	-0.0063* (0.0033)			-0.0050** (0.0022)
Publicsh_x_Adminsh		0.0001 (0.0002)			
PublicD			-0.1603* (0.0952)	-0.4786*** (0.1392)	
PublicD_x_Adminsh				0.0245*** (0.0081)	
Size_x_Adminsh					0.0015 (0.0020)
Intfrac	-0.0055*** (0.0012)	-0.0056*** (0.0013)	-0.0062*** (0.0012)	-0.0064*** (0.0012)	-0.0055*** (0.0012)
NGOdensity	0.0062 (0.0050)	0.0062 (0.0051)	0.0062 (0.0051)	0.0055 (0.0051)	0.0062 (0.0051)
Herfin	-0.0097** (0.0042)	-0.0096** (0.0042)	-0.0097** (0.0043)	-0.0097** (0.0043)	-0.0098** (0.0042)
Constant	3.0703** (1.4118)	3.1066** (1.4037)	2.9059** (1.4037)	3.2949** (1.3515)	3.5000** (1.3694)
Observations	4,316	4,316	4,316	4,316	4,316

Notes: Reports the coefficients; for marginal effects, see the text. All estimations include year fixed effects as well as NGO-type fixed effects that are not shown. Standard errors are clustered at the NGO level. *** (**, *) denote significance at the one (five; ten) per cent level.

Table 5: Probit estimations, non-linear effects (administrative-cost quintiles, age group dummies and splines)

Variables	(1) Probit	(2) Probit	(3) Probit	(4) Probit	(5) Probit
Size	-0.4291** (0.1887)	-0.4774** (0.1928)	-0.4630** (0.1965)	-0.4216** (0.1785)	-0.4392** (0.1863)
Size*2	0.0092 (0.0066)	0.0109 (0.0067)	0.0104 (0.0069)	0.0088 (0.0062)	0.0094 (0.0065)
Fundsh	-0.0081 (0.0073)	-0.0080 (0.0073)	-0.0076 (0.0074)	-0.0072 (0.0074)	-0.0080 (0.0075)
Adminsh	0.0107** (0.0042)	0.0111*** (0.0043)	0.0114*** (0.0042)		
Adminsh dummies	lower quintile			-0.0179 (0.1348)	0.0043 (0.1369)
	middle quintile			0.0859 (0.1306)	0.1097 (0.1326)
	upper quintile			0.0374 (0.1287)	0.0656 (0.1299)
	highest quintile			0.2377* (0.1299)	0.2667** (0.1307)
Donationsh	-0.0009 (0.0018)	-0.0011 (0.0018)	-0.0008 (0.0018)	-0.0012 (0.0019)	-0.0011 (0.0018)
Publicsh	-0.0051** (0.0022)	-0.0053** (0.0022)	-0.0050** (0.0022)	-0.0052** (0.0022)	-0.0053** (0.0022)
Intfrac	-0.0055*** (0.0012)	-0.0053*** (0.0012)	-0.0053*** (0.0013)	-0.0056*** (0.0013)	-0.0056*** (0.0012)
NGOdensity	0.0062 (0.0050)	0.0061 (0.0051)	0.0063 (0.0051)		0.0062 (0.0051)
Herfin	-0.0097** (0.0042)	-0.0088** (0.0042)	-0.0092** (0.0043)		-0.0095** (0.0042)
Age	-0.0605 (0.0444)			-0.0699 (0.0442)	-0.0597 (0.0445)
Age_group_2		0.3089*** (0.1110)			
Age_group_3		0.0040 (0.1243)			
Age_group_4		-0.0427 (0.1297)			
Age_group_5		-0.1438 (0.1781)			
Spline_1			0.0554 (0.0393)		
Spline_2			-2.4162* (1.2373)		
Spline_3			3.7756** (1.9048)		
Constant	3.0703** (1.4118)	3.1949** (1.4363)	3.0655** (1.4575)	2.6644** (1.3519)	3.2147** (1.3893)
Observations	4,316	4,316	4,316	4,316	4,316

Notes: Reports the coefficients; for marginal effects, see the text. All estimations include year fixed effects as well as NGO-type fixed effects that are not shown. Standard errors are clustered at the NGO level. *** (**; *) denote significance at the one (five; ten) per cent level. Lowest quintile represents the reference category for Adminsh dummies.

Table 6: Complementary log-log and IV Probit models

Variables	(1) cloglog	(2) cloglog	(3) cloglog	(4) IV Probit	(5) IV Probit	(4) IV Probit
Size	-0.2905*** (0.0446)	-0.4153 (0.3325)	-0.4009 (0.3401)	-0.1097*** (0.0313)	-0.6427** (0.3157)	-0.6819** (0.3190)
Size*2		0.0030 (0.0122)	0.0024 (0.0125)		0.0165 (0.0104)	0.0177* (0.0106)
Age	-0.2259*** (0.0877)	-0.1220 (0.0890)	-0.1005 (0.0883)	-0.3170*** (0.0796)	-0.2418*** (0.0841)	-0.2245*** (0.0848)
Fundsh	-0.0048 (0.0145)	-0.0130 (0.0143)	-0.0140 (0.0143)	-0.0022 (0.0110)	-0.0132 (0.0125)	-0.0126 (0.0126)
Adminsh	0.0216*** (0.0077)	0.0171** (0.0079)	0.0183** (0.0077)	0.0076 (0.0083)	0.0034 (0.0094)	0.0039 (0.0095)
Donationsh		-0.0021 (0.0035)	-0.0016 (0.0035)		-0.0025 (0.0033)	-0.0022 (0.0033)
Publicsh		-0.0104** (0.0046)	-0.0103** (0.0046)		-0.0064* (0.0035)	-0.0065* (0.0035)
Intfrac		-0.0107*** (0.0025)	-0.0108*** (0.0025)		-0.0061*** (0.0019)	-0.0061*** (0.0020)
NGOdensity			0.0133 (0.0106)			0.0133* (0.0080)
Herfin			-0.0202** (0.0094)			-0.0112* (0.0062)
Constant	0.0197 (1.2787)	2.2032 (2.5477)	2.9893 (2.5560)	-2.9786 (239.2772)	2.1931 (163.5393)	2.5100 (164.5876)
Wald test of exog. (p-val.)				0.6201	0.8196	0.7846
Observations	4,319	4,316	4,316	2,856	2,852	2,852

Notes: Reports the coefficients; for marginal effects, see the text. All estimations include year fixed effects as well as NGO-type fixed effects that are not shown. Standard errors are clustered at the NGO level. *** (**; *) denote significance at the one (five; ten) per cent level. Instruments are the level of *Size*, *Size*2*, *Fundsh*, *Adminsh*, *Donationsh*, *Publicsh*, and *Intfrac*, lagged by 2 and 3 periods.

Figure 1: Exit probability depending on *Size*; non-linear relationship (according to column 3 in Table 2)

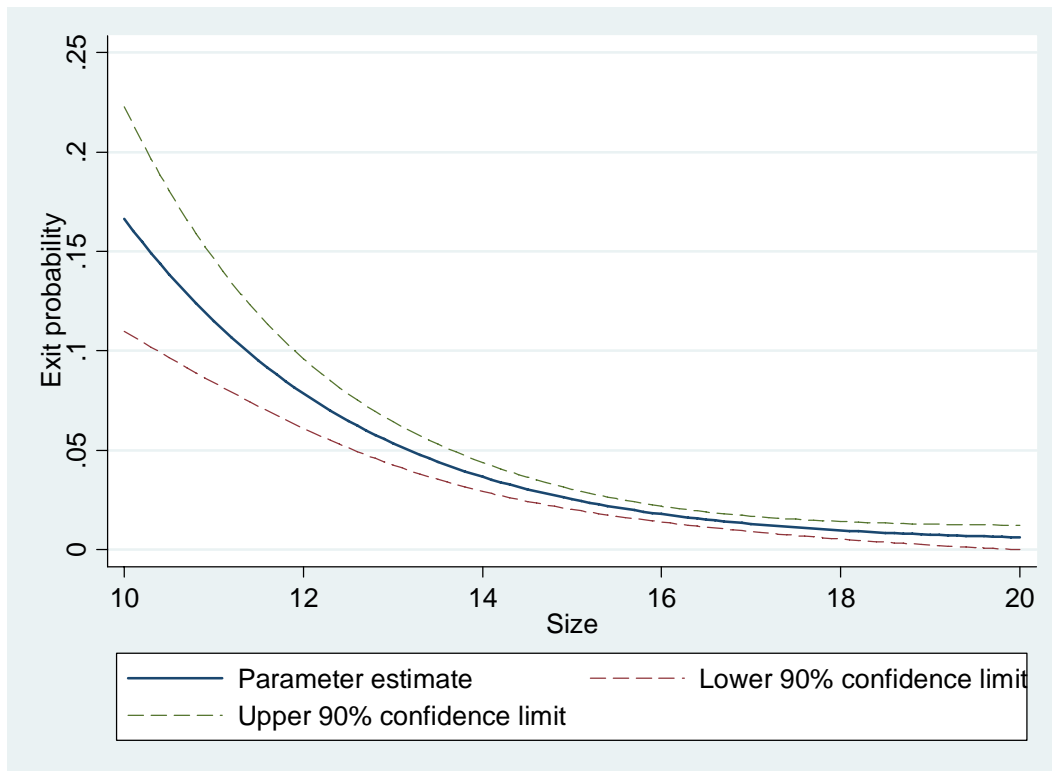


Figure 2: Marginal effect of *Adminsh* on exit probability; conditional on *Publicsh* (according to column 2 in Table 4)

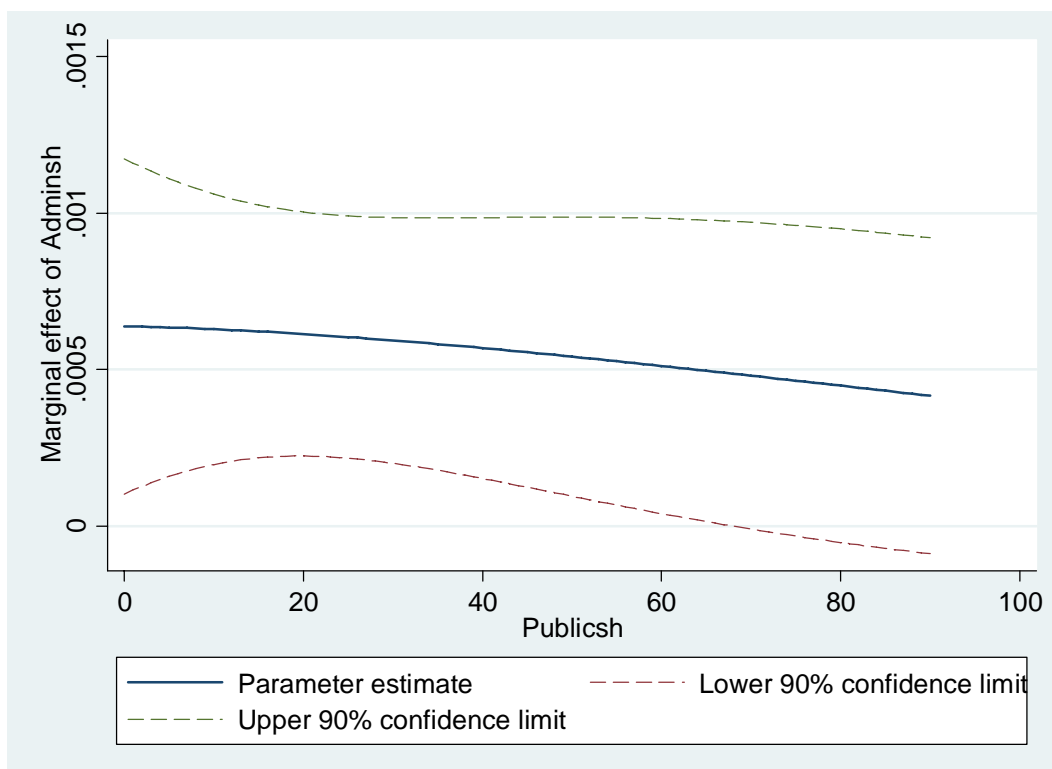


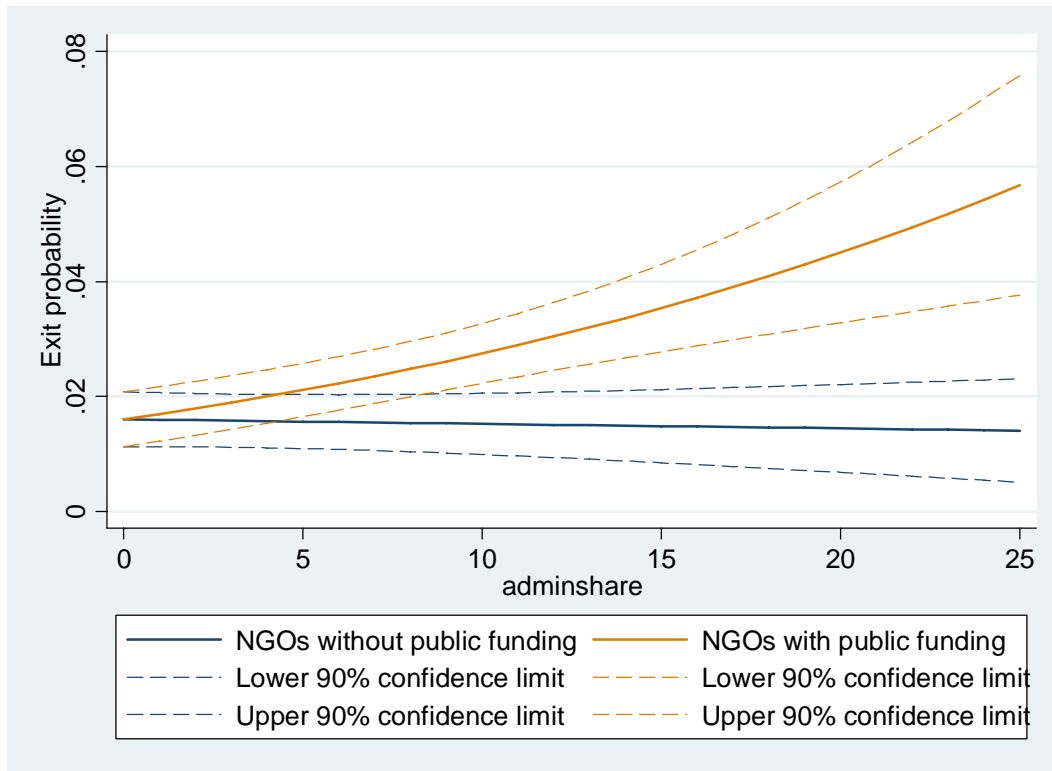
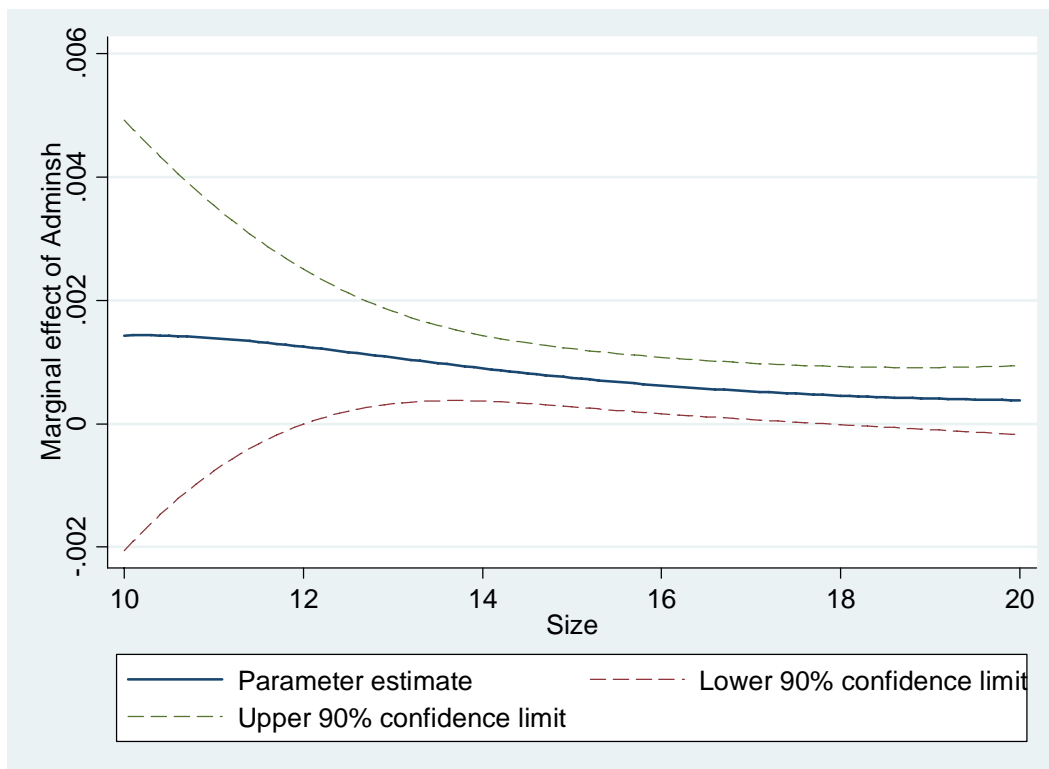
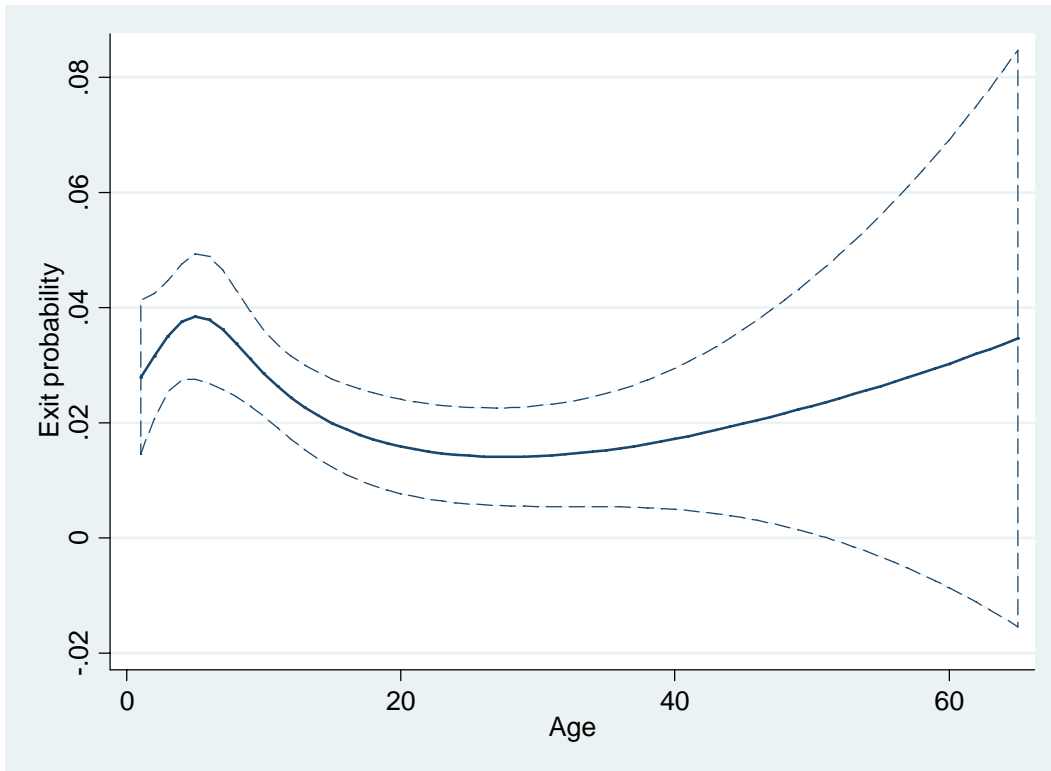
Figure 3: Exit probability depending on *Adminsh* and *PublicD* (according to column 4 in Table 4)Figure 4: Marginal effect of *Adminsh* on exit probability; conditional on *Size* (according to column 5 in Table 4)

Figure 5: Exit probability depending on *Age*; non-linear relationship (according to column 3 in Table 5)



Note: broken lines provide lower and upper 90% confidence limits.

Appendix A: Definition of variables

Variable	Definition
Size	Total expenditures of NGO _i in year t-1; logged
Size*2	Size squared
Age	Number of years since NGO _i registered with USAID; alternative measure: number of years since NGO _i 's foundation; logged
Fundsh	Expenses for fundraising of NGO _i in year t-1; share in total expenditures; if the database does not report a positive entry for fundraising in a particular year, the observation is considered to be missing; alternatively, we set fundraising to zero and include these observations; see text for details
Adminsh	Expenses for administration and management of NGO _i in year t-1; share in total expenditures
Donationsh	Private donations to NGO _i in year t-1; share in total revenues
Publicsh	Public funding of NGO _i in year t-1; share in total revenues; public funding includes funds from USAID, other US government sources, foreign governments and international organizations
Intfrac	Share of expenditures spent for international development cooperation in total (program-related) expenditures; note that various NGOs in the sample are active in both overseas programs and domestic programs within the United States
NGOdensity	Number of NGOs in the sample being active in the same sub-group as NGO _i ; sub-groups relate to different religious affiliations in the case of religious NGOs, and to different fields of activity in the case of secular NGOs; see text for details
Herfin	Herfindahl index reflecting the concentration of resources (total revenues) among NGOs belonging to the same sub-group, as defined above; higher index values reveal more concentrated resources

Note: the database collected by Rachel McCleary is the source of all variables listed; NGOdensity and Herfin are based on owned calculations

Appendix B: Summary statistics

Variables	Observations	Mean	Standard deviation	Minimum	Maximum
Size	6,182	14.9	2.3	3.9	21.4
Age	6,751	1.9	1.1	0.0	4.2
Fundsh	4,523	5.4	5.6	0.0	27.0
Adminsh	5,964	11.4	9.3	0.0	54.9
Donationsh	6,180	60.8	34.8	0.0	240.1
Publicsh	6,180	25.4	30.9	0.0	118.9
Intfrac	6,751	76.3	35.1	0.0	100.0
NGOdensity	6,684	27.5	18.6	1.0	83.0
Herfin	6,684	26.7	18.9	0.0	100.0

Note: the summary statistics refer to the overall sample of 887 NGOs underlying the stylized facts of Table 1. In a few cases the share of donations or public funds in total revenues exceeds 100 per cent due to losses from commercial activities, i.e., negative entries for the third source of NGO revenues.