THE OBJECTIVE OF NONPROFIT ENVIRONMENTAL GROUPS:
ARE THEY MAXIMIZING SERVICES
OR THEIR BUDGETS?

by

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ABSTRACT

The purpose of this thesis was to determine the objective of prominent nonprofit environmental groups. Two possible objectives have received considerable attention in the nonprofit literature: service maximization and budget maximization. Accordingly, this study examines whether environmental organizations attempt to maximize the services they provide or maximize the budgets they control? A linear model using procedures to handle pooled data was used in the estimation. The results imply that the environmental groups tested tend to maximize their own budget rather than the services they provide, but the results are not entirely conclusive. There is some evidence that these organizations have mixed motivation. Future studies would be aided by additional data, including both more years and organizations.
CHAPTER 1

INTRODUCTION

Many prominent environmental groups recently have been criticized for deviating from their stated purpose. Critics claim that the actions of these environmental organizations are motivated by the pursuit of donations, membership and power, not only sound environmental concerns. Such accusations are in conflict with the widely held and promoted notion that environmental groups are passionate defenders of the public’s interest in the environment, natural resources, and wildlife.

The controversy is illustrated by comparing the following statements. One is the "mission" statement of the Audubon Society (1985), and the other a criticism of the Audubon Society by R. J. Smith (1993).

The Society’s mission is expressed by the Audubon Cause: to conserve plants and animals and their habitats, to further the wise use of land and water, to promote rational energy strategies, to protect life from pollution, and to seek solutions to global environmental problems (National Audubon Society Annual Report 1985, 3).

As staff, overhead and costs had soared throughout the 1980’s, and its [Audubon’s] annual budget had reached $40 million, growth became not only a necessity, but an end in itself -- the holy grail... But growth to what end? Some argued Berle’s [Audubon’s president] goal
was to increase membership from 500,000 to 1.2 million . . . Others thought his ultimate goal for the Society was a gigantic multimillion dollar skyscraper in New York City -- a new Audubon House . . . . Whatever the goal, it clearly had nothing to do with protecting birds (Smith 1993, 26-27).

One of the first books to criticize the modern environmental movement is Chase (1986):

National environmental organizations began to look like clones of the corporations they had been created to resist. Explosive growth had turned groups such as Audubon and Sierra into bureaucracies, wherein vested lobbyists replaced rough-edged activists. They practiced politics as usual . . . (Chase 1987, 340-1).

Gifford (1990) is an article in Outside Magazine that critiques and rates the major environmental organizations. Each of the 25 groups the article addresses is judged by such criteria as "what they've done lately" and "where the money goes." Such an article would not be necessary if "only there weren't quite so many groups, and if only they weren't so susceptible to the usual foibles of business and human nature" (Gifford 1990, 69).

Bonner (1993) is critical of "western" environmental groups operating in Africa. According to Bonner, these organizations went against their own better judgment, and the urging of the scientific community, when they supported the international ban on ivory in 1989. Bonner claims that before 1989 not a single respected scientist or environmental group favored the ivory ban because the sale of ivory was an important source of income for the African people, wildlife departments in particular. In addition, the elephant was far from endangered in
much of Africa. In some areas they were so numerous that they wreaked havoc on their range and nearby towns. Because of their numbers, the elephants would overeat the existing forage (that all wildlife depended on) and be forced to go looking for food in populated areas. As a result, they often trampled crops, occasionally injuring or killing children. The practice of culling elephants was traditionally used to reduce elephant numbers so as to prevent overgrazing and crop loss, as well as finance other wildlife protection efforts. The environmental groups eventual decision to support the ban was made, Bonner argues, in order to enhance the image of these organizations with American and European donors. It had the intended effect. The result of the ivory ban was an outpouring of contributions resulting from the favorable western press. In short, supporting the ban was a boon to environmental groups at the expense of African wildlife and the African people’s standard of living.

Even more critical of the intentions of environmental organizations is the caustic attack by Arnold and Gottlieb (1993). According to them, environmental groups range from badly misguided, to purely self-interested job destroyers. Arnold and Gottlieb contend that the environmental sector has abused its exempt tax status and favorable public image to stymie legitimate development and reap untaxed profit, all at the expense of the taxpayer and the working man.¹ Take, for example, their view of The Nature Conservancy (TNC).

¹ Most environmental groups are tax exempt, as discussed below, under section 501c(3) of the Internal Revenue Code.
The Nature Conservancy is so secretive because it is a big money non-profit upperclass real estate firm. TNC buys private land in the United States, sometimes at the request of the federal government, and then sells the bulk of it—about two thirds—to that federal government at substantial markups. TNC also builds commercial housing developments on its "saved" properties. TNC has also operated commercial farms, including cotton plantations, on its "saved" properties. TNC also runs a "save the rainforest" project with no accountability to prove it did anything beyond selling its donors a promise of pie-in-the-sky (Arnold and Gottlieb 1993, 81).

The theme of their book is clear: "Conservation has been taken over by Big Money" (Arnold and Gottlieb 1993, 81).

Such criticisms do not go unchallenged. The "wise use" movement is criticized by Jay Hair, President of the National Wildlife Federation: "This is a classic example of a lie galloping across the range while the truth is still pulling its boots on. The self proclaimed ‘Wise Use Agenda’ is merely a wise disguise for a well financed, industry-backed campaign that preys upon the economic woes and fears of U.S. citizens" (quoted in Lewis 1992, 6). Of the "wise use" movement, George Frampton Jr., the president of the Wilderness Society claims "It’s an assault by commercial interests trying to preserve their traditional freedom to plunder the West without restriction--indeed, with taxpayer subsidies. They claim they lead a grass-roots movement, but they are in fact speaking for industry and their grass is watered by corporate money" (Lewis 1992, 7).

Chase (1986) is criticized for being one sided and overstated. "His case is marred . . . by selective use of the facts, hyperbole and the use of anonymous quotations meant to ‘prove’ points . . . ." (Shabecoff 1986, 17).
Bonner's book is challenged by environmentalist Kenneth Brower (1993, 127). "Errors in fact, flaws in logic, and an unmitigated tendentiousness mar Bonner's case throughout." Bonner is chastised by Brower for being hypocritical when judging environmentalists and guilty of leveling ad hominem attacks against anyone speaking out in favor of the ivory ban. About the kindest thing that Brower has to say about Bonner's book is this: "Somewhere in all the smoke Bonner smells there is clearly a little fire. But the fact that conservation organizations have flaws is not much of a revelation."

The Nonprofit Status of Environmental Groups

If environmental groups are acting with an alternative agenda to legitimate service provision, the problem (from society's standpoint) is compounded by their nonprofit status. Environmental organizations are not only free from government taxation, contributors also do not pay taxes on the money they donate to environmental groups. Tax law affords these organizations a double tax break. The work of such firms is rewarded in the tax laws because it is deemed to be beneficial to society. "A qualified charity [such as a nonprofit environmental group] is placed on a pedestal above all other exempt organizations and above the many more non-exempt corporations in this country. . . . They wear white hats" (Houck

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2 The Sierra Club, Clean Water Action and Environmental Action are exceptions in the data that are used in this thesis. Contributions to these groups are not tax exempt for the donor because these groups lobby more than is permissible for 501c(3) charities. However, these three groups do not themselves pay taxes.
1984, 1429-30). The main requirement for such preferential treatment is that no part of the net earnings of a qualified organization may go to the direct benefit of any private individual, officer, director, or trustee. A nonprofit group operating with the objective of financial gain for the management is essentially an untaxed business with an unfair advantage over its taxed competitors. This is not the intent of nonprofit charters.

Purpose of the Thesis

The purpose of this thesis is to analyze the objective of the environmental groups in the data set. Are they attempting to maximize the charitable services they provide donors, is their goal based purely on self interest, or is it some combination of the two? In addition, it will be tested if indicators of inefficiency such as the percentage of a groups total budget devoted to management and fundraising are taken into consideration by donors when they make decisions about contributing.

The organization of the thesis is as follows. Chapter 2 will discuss the relevant literature on the subject of organizational efficiency and objectives, specifically with regard to nonprofit groups. Chapter 3 will develop a theoretical model that will be used to test the objective of the environmental groups. Chapter 4 will outline the data and the justification for the variables in the empirical model. Chapter 5 will discuss the empirical model and presents the results of the analysis.

3 Net earnings in this situation means pure profit, earning in excess of that needed to cover the services provided by the organization.
The conclusions of the thesis will be summarized and the shortcomings addressed in chapter 6.
CHAPTER 2

LITERATURE REVIEW

General Literature

The controversy discussed in Chapter 1 is really a question of whether the managers of environmental groups are behaving as contributors (and society) would like them to behave. Donors have certain expectations about how their money is going to be spent by an environmental group.\(^4\) Once the money is given, however, donors have precious little say in its actual use. This separation of "ownership" and control is similar to the traditional principal-agent problem. In the case of environmental groups, the principal (donors) does not own the firm, as a stockholder does, but instead donates money to the organization (agent) to further its goals.\(^5\)

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\(^4\) Although donor motivation is rather poorly understood, it will be assumed that donors contribute to an environmental organization in order to pay for the charitable or environmental services that organization provides.

\(^5\) Donors also cannot transfer shares as stockholders can.
Nonetheless, as pointed out by Jensen and Meckling (1976, 308-09), agency costs occur in any situation where cooperative effort is required to achieve an end.

If both parties to the relationship are utility maximizers, there is good reason to believe that the agent will not always act in the best interest of the principal. The principal can limit divergences from his interest by establishing appropriate incentives for the agent and by incurring monitoring costs designed to limit the aberrant activities of the agent. In addition in some situations it will pay the agent to expend resources (bonding costs) to guarantee that he will not take certain actions which would harm the principal or ensure that the principal will be compensated if he does take such actions. However, it is generally impossible for the principal or the agent at zero cost to ensure that the agent will make optimal decisions from the principal’s viewpoint. In most agency relationships the principal and the agent will incur positive monitoring and bonding costs (non-pecuniary as well as pecuniary), and in addition there will be some divergence between the agent’s decisions and those decisions which would maximize the welfare of the principal.

Therefore, three costs are associated with the agency problem: the cost of monitoring by the principal, the cost of bonding by the agent, and the cost of the residual loss resulting from the reduction in the principal’s welfare due to the remaining divergence in the agent’s behavior.

In addition, Jensen and Meckling (1976, 311) stress that a firm is not an individual. "It is a legal fiction which serves as a focus for a complex process in which the conflicting objectives of individuals... are brought into equilibrium within a framework of contractual relations." It is important to note the similarity between the inner workings of a firm and problems of shirking and monitoring in team production addressed by Alchian and Demsetz (1972, 780). With team production it is difficult, if not impossible, to determine each individual’s
contribution to the output produced. Therefore, "each input owner will have more
incentive to shirk when he works as part of a team, than if his performance could be
monitored easily or if he did not work as a team." The result is the potential for
shirking in team production. These points provide a useful backdrop for the
discussion of the nonprofit literature.

Nonprofit Literature

Hansmann (1980) recognized that nonprofit organizations arise, in large part,
to provide public goods. For-profit firms generally produce goods with well
defined personal property rights; consumers of such goods are rivals in consumption.
Many nonprofit groups produce public goods which, by their nature, have poorly
defined property rights (e.g., environmental quality). Because the consumption of
such goods by one person does not reduce the amount available to others
(consumers are not rivals in consumption), public goods are difficult or impossible
to sell on the market. Recognizing this, Hansmann (1980, 845) proposed that
nonprofit firms arise in response to this type of market failure. "Nonprofit enterprise
is a reasonable response to a particular kind of ‘market failure’, specifically the
inability to police producers by ordinary contractual devices." Such contractual
devises are rendered useless by the lack of property rights in these goods. However,
rather than a market failure, as Hansmann termed it, it is more useful for this paper

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6 Public goods in the economic sense. "A good is ‘public’ if providing the good
to anyone makes it possible, without additional cost, to provide it to everyone" (Hirshleifer and Glazer 1992, 461).
to think of nonprofit management as taking on extreme bonding costs to induce donations. Since donors are unable to observe the output of environmental groups, they cannot determine the quality or quantity of that output. In markets such as this, there is asymmetry of information between producer and those paying for the product. Producers know what they are producing but donors do not; the donors to nonprofit firms do not directly consume the output. Monitoring the agent is, therefore, prohibitively costly for the principal. The result is that there is substantial room for shirking by the agent. Donors to environmental groups are as aware of the potential for shirking as is the management of the organization. In order to induce the donors to give money, the organization forgoes profit as a bonding cost. If the profit incentive is removed, theoretically, donors are less vulnerable to self interested management by the organization. Nonprofit firms arise to assure the consumers that their money is being well spent.

Non-Profit Objectives

If nonprofit organizations forgo profit to induce donations, what then motivates the management? What is their objective? Two possibilities have received attention in the nonprofit literature: service maximization and budget maximization.

Service maximization embodies the traditional view of nonprofits as philanthropic organizations providing needed services; they carry out the desires of the donors. There is intuitive appeal in service maximization as a goal in nonprofit
groups. Most nonprofit managers would profess a strong belief in what their organization is trying to accomplish. Therefore, on ideological grounds, they presumably have a personal interest in seeing the organization accomplish its goals; other considerations may be secondary. In addition, competition between various nonprofits for donations as well as relatively free entry into the environmental nonprofit market may limit how far a group can stray from its stated purpose. Also, monitoring activities such as the presence of government supervision, watchdog groups, concerned citizens, and potential legal action may provide an adequate check to self-interested management.

Budget maximization is another possible objective. Nonprofit firms "freed for the discipline of the market" may pursue managerial goals of power and prestige maximization, and this entails [the] choice of a budget maximizing allocation" (Steinberg 1985, 3). The possibility of budget maximization in nonprofits was perhaps first recognized by Niskanen (1971) in the context of government bureaucracies. The incentive to expand a government organization is also recognized by Johnson and Libecap (1989, 431). "It is commonly asserted that government employees, acting in their own self-interest, will foster the growth of their organizations. Growth of the organization is seen as a means for increasing salaries, as well as the other arguments in the utility function." Although, strictly speaking, nonprofits are legally prohibited from directly distributing "profits" among the management, the parallel between governmental agencies and nonprofit groups may still be valid. There is good reason to think that there would be positive
correlation between an organization's size and the utility the management derives. Prestige, travel, plush accommodations, and a larger supporting staff may accompany organizational growth. If budget maximization is the primary goal of nonprofit organizations, then such firms are probably inefficient in meeting their stated charitable purposes.

Fundraising as a Measure of Nonprofit Objectives

In order to assess the goal of nonprofit groups, an objective measure of behavior is needed. Economists have attempted for some time to determine what brings about contributions to nonprofit groups in an attempt to understand what motivates donors to give. That pursuit led to using such information to try to ascertain how efficiently an organization uses its resources.

In the framework of production analysis, if one thinks of donations as an output and spending on fundraising as an input, the question of organizational efficiency can be approached by analyzing the implied production function. If we hold other inputs constant, at the margin, the productivity of fundraising expenses will shed light on the effectiveness of a fundraising campaign.

Boyle and Jacobs (1978) were probably the first to estimate nonprofit contribution functions in order to test a fundraising efficiency hypothesis. They

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7 In this study by Boyle and Jacobs (1978) and the following paper by Rose-Ackerman (1982) the implicit assumption was that nonprofit organizations were trying to maximize net contribution (service maximization). "Efficiency" was tested with that in mind. The work of Steinberg challenged this assumption as will be discussed later in this chapter.
conducted a study comparing 171 United Way divisions, 48 chapters of the American Heart Association and 48 chapters of the American Cancer Society. In the study, they tried to determine how effective fundraising was in inducing donations. This was done by estimating a production function by regressing donations (the output) against relevant input variables. Such inputs were of two kinds: 1) endogenous inputs under the control of the organization such as per-capita fundraising cost, type of fundraising, and the strategy of fundraising and 2) exogenous inputs dependent on socio-economic variables including per-capita income, population density, and the "need" of the organization. They found that choice factors [endogenous inputs] were overwhelmingly more important in determining donations than were socio-economic and other factors [exogenous inputs]. Almost all of the recent research in the charitable giving area has focused upon donor motivation. For the most part, this seems to have been misplaced effort. We cannot find that these variables are of real significance" (Boyle and Jacobs 1978, 27).

In addition, they concluded that there was substantial room to increase net revenue through increased fundraising; these organizations were inefficient in their choice of fundraising expense. It "is estimated that further expansion would take them towards their maximum net donations point, rather than leading away from it."

Rose-Ackerman (1982) conducted a pioneering theoretical study of nonprofit fundraising behavior. She introduced three alternative possibilities based on different assumptions regarding donors' perceptions of fundraising. In her first model (similar to the study by Boyle and Jacobs (1978)), donors were assumed to be
indifferent to the share of a firm's resources devoted to fundraising. According to her second hypothesis, donors are sensitive to the amount of money an organization spends on fundraising. Therefore, included in the firm's contribution production function was the percentage of a firm's total revenue spent on fundraising (fundraising share). The insight was that donors may use a firm's fundraising share as an indication of how well run that organization is. She assumed that from the perspective of donors, contributions are wasted when spent on anything other than a group's charitable services. Fundraising, therefore, is a more or less useless expense that drives up the cost to the donor of the charitable services he desires. Rose-Ackerman calculated a dollar's worth of a firm's output as being proportional to the share of resources spent soliciting donations. A contributor would calculate the price of an organization's services as $\text{Price} = \frac{1}{1 - \text{Fundraising}}$. For example, if a firm puts 25% of its contributions back into fundraising, then the price of contributing a dollar's worth of the firm's output is $\$1.33 = \frac{1}{1 - 0.25}$.

By assuming that donors use fundraising share to measure efficiency, Rose-Ackerman realized that she was ignoring indirect effects from donations. Her third model took them into account. Accordingly, the "sophisticated" donor would realize that a nonprofit firm does not operate in a vacuum. For instance, donations to one nonprofit group may induce more (or fewer) contributions from other donors to that organization. If a firm uses some percentage, say 25%, of donations to solicit further contributions, that 25% could conceivably induce future donations in excess of the 25% spent on fundraising. The actual price of a dollar of a firm's output
could be less than, greater than, or equal to a dollar depending on the strength of this multiplier effect at the margin. In addition, contribution to one organization could increase or decrease contributions to other related organizations. In other words, fundraising expense incurred by one organization may "steal" donations from other organizations. If the donor is indifferent between donating to two such organizations, such a transfer is simply a redistribution of contributions between ideologically identical organizations. Therefore, there is no increase in the donor's utility above that resulting from his own donation. Although Rose-Ackerman recognized this third case as the appropriate rational model, she retained the second model (which accounts for donor aversion to fundraising) as the most plausible because the average donor could not calculate marginal fundraising productivity and would instead look at fundraising share.

Weisbrod and Dominguez (1986) empirically estimated the fundraising productivity of some 300,000 nonprofit firms using data from 1973-1976 IRS form 990 tax returns. These organizations were broken into seven categories depending on the nature of the service that the groups provided.

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8 Weisbrod and Dominguez do not assume, however, that maximization of net donations is necessarily the goal of the organization as did the previous studies by Boyle and Jacobs (1978) and Rose-Ackerman (1982). They made no formal attempt, however, to test budget versus service maximization. Instead, they merely attempted to achieve the best fit to the data with their fundraising production function.

9 These seven categories of nonprofit groups were: 1) library, 2) art exhibit, museum, zoo, etc., 3) supplying goods and services to the poor and aged, 4) hospital, 5) aid to the handicapped, 6) scientific research, 7) school, college, trade school.
model, they retained Rose-Ackerman's price of output variable. However, rather than include current fundraising costs, Weisbrod and Dominguez assumed that there would be a lag between the time when fundraising costs are incurred and the time the resulting donations are received. Thus, in their model, lagged fundraising entered directly while current fundraising as a percentage of total entered only in the price of output variable. Also new to this particular model was the inclusion of the age of an organization as an explanatory variable. This was intended to proxy the donor's perceived quality of output or the accumulation of brand name loyalty by a firm. In addition, the natural log of both the dependent and independent variables was used so that the coefficients would represent percentage changes. Weisbrod and Dominguez found that "nonprofit firms are not maximizers of net expenditures on output (total revenue net of fundraising). However, since they spend on fundraising up to the point at which its marginal contribution to gross revenue is zero, they may be maximizers of total expenditures, as suggested by Niskanen" (Weisbrod and Dominguez 1986, 92).

10 This is a slight variation on the second model proposed in Rose-Ackerman (1982). In that model, the price of a nonprofit organization's output is proportional to the share of a firm's total resources spent soliciting contributions. Specifically, output price equal one divided by one minus the percentage of total budget spent on fundraising \((1/(1 - \% \text{ fundraising}))\). Weisbrod and Dominguez broaden the percentage spent fundraising to include management costs as well \((1/1 - (\% \text{ fundraising} + \% \text{ management}))\).

11 The log-log form was used by Weisbrod and Dominguez presumably because of the huge differences in size that must result between the various 300,000 nonprofits.
Although Weisbrod and Dominguez acknowledged the possibility that nonprofit organization might be maximizing something other than net contributions, Steinberg was the first person to specifically test for such a possibility.\footnote{See Steinberg (1983, 1985, 1986\textsuperscript{a}, 1986\textsuperscript{b}).} He turned the question of organizational efficiency around. Instead of asking if nonprofit organizations are efficient (are they maximizing net contributions), Steinberg asked, if we assume nonprofit organizations are efficient, what are they efficiently doing? In other words, in order to test if a group is efficient in the use of its resources, one must first know what the goal of the firm is. By taking the approach that nonprofits are rationally maximizing something, the allocation of funds by an organization should illuminate that objective. This approach is adopted in this thesis in order to test the objectives of nonprofit environmental organizations.

Another insight of Steinberg’s was that output price, as introduced by Rose-Ackerman (and used by Weisbrod and Dominguez), should have no predictable effect on a rational donor’s decision to contribute to an organization. If

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\text{the non-profit organization acts to maximize any of a broad range of plausible objectives, then the price of charitable service equals$1.00$, regardless of the level of fundraising. In a more general case, fundraising share influences the price of charitable services in a very complicated way, and there is no reason to assume that organizations with higher fundraising shares are ‘worse buys’ (Steinberg 1986, 347).}
\]

First, Steinberg questions whether the typical donor knows a firm’s fundraising share. Second, he proves that the typical small donor (if they know fundraising
share at all), should recognize that the output price they face is equal to one. One dollar donation should create one dollar’s worth of services. This is because a relatively small donation will have very little effect on the way other donors respond to fundraising (there is no substitution effect), and thus could not be expected to alter the organization’s decisions about its expenditures. A small donation should only cause an upward shift the contribution function (production function for contributions from fundraising) but have no effect on the shape of the function. Therefore, the amount of contributions attributable to the marginal dollar of fundraising should not be altered. Such a donation, therefore, should have almost no effect on the firms choice of fundraising expenditure. Thus, the ‘fundraising share’ contains no helpful information on how to rationally allocate donations between charities" (Steinberg 1986, 352).

There were two other key changes in Steinberg’s specification that differ from other studies. First, service and management expenditures were included in the model for a variety of reasons. The sheer size of both these variables serves as an advertisement (positive or negative) and an indication of productivity to donors. The more money that is spent in these areas, the more people (directly or indirectly) the organization will affect. Also, fundraising and service productivity rest crucially on the competence of the organization’s management. Therefore, donors should recognize that management costs will likely exhibit first increasing and then decreasing returns to scale (like most other inputs to a production function).

13 The same argument holds for management expenditures.
Therefore, management costs could have either positive, negative, or no effect on contributions depending upon the donors' perception of the marginal value of the management. In terms of service expenditure, donors may perceive the amount of services as not only an advertisement, but a measure of quality in a firm. Additionally, government grants may also hinge, in part, on the size of the perceived amount of charitable work an organization does.

The second key difference in Steinberg's model was that both current fundraising and management as well as lagged fundraising and management are included. This was because he assumed that these variables influence donors beyond the current time period.\textsuperscript{14}

Steinberg (1983) estimated the marginal effect of fundraising with the same data on nonprofits later used in Weisbrod and Dominguez (1985). The nonprofit sector was found to be a mixture of service and budget maximizing industries. However, two of the nonprofit sectors seemed to have mixed motives. Steinberg suggested that such intermediate objectives may result from split control among managers with differing motives. Additionally, contributions seemed to be affected by fundraising levels and not fundraising shares, as predicted in Steinberg (1983). This is in contrast to the model forwarded by Rose-Ackerman (1982) and employed by Weisbrod and Dominguez (1986).

\textsuperscript{14} This assumption will not be maintained for the work done in this paper because I do not believe that, given the annual data in this thesis, these variables have a lasting effect on donors.
CHAPTER 3

THE MODEL

Nonprofit groups can obtain resources in four ways. They can (1) get membership dues and contributions, (2) sell goods and services for a fee, (3) earn interest on capital investment, and (4) make use of volunteer labor. These four sources of funds imply a budget constraint. Nonprofits can make use of these resources in three ways. They can (1) provide charitable services, (2) spend money fundraising, and (3) finance administration or overhead.\(^\text{15}\) Therefore, the problem a nonprofit organization faces is to maximize the output objective (as defined by the firm’s goals, given the three uses of funds) subject to the budget constraint. Given these categories of income and expenditure, we can write any nonprofit’s budget constraint from their income statement as follows:

\(^{15}\) For simplicity, it is assumed here and throughout the theoretical section that nonprofits cannot borrow or lend in capital markets.
1) \( C + Z = S + F + M \)

where

\begin{align*}
C &= \text{Contributions and dues}, \\
Z &= \text{All other revenue sources (sale of goods and services, volunteer labor and interest income)}, \\
S &= \text{Service costs}, \\
F &= \text{Fundraising costs}, \\
M &= \text{Management and overhead}.
\end{align*}

Contributions (C) and all other revenue (Z) account for the total income of a nonprofit. Service costs (S), fundraising costs (F), and management costs (M) represent all expenditures. Equation (1) must hold as an identity. The key to testing the difference between service maximization and budget maximization in nonprofits is that fundraising expenditure will serve different ends for different firms depending on their objective. A service maximizing firm will solicit donations to obtain the greatest difference between contributions received and the funds spent soliciting these contributions (net contributions). A budget maximizing firm, on the other hand, will solicit funds until total contributions are maximized, regardless of the costs. A budget maximizing firm wants to maximize the total size of the organization.16 Given these different types of behavior for different goals, fundraising expenditure should reveal a firm’s objective. A graphical analysis of the problem provides insight into why this is true.

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16 Budget and service maximization are analogous in this respect to the more commonly used comparison of sales maximization versus profit maximization in the analysis of for-profit firms.
In Figure 1, \( C(F) \) represents the contribution function for a nonprofit firm. The 45° line represents a dollar for dollar tradeoff between fundraising and contributions. The higher the contribution function, \( C(F) \), is above the 45° line the greater the net contributions \( (C(F) - F) \) received by an organization. The intercept (I), is drawn as positive presuming the firm would receive some donations without any current fundraising, possibly due to inquisitive and motivated donors. Over the range from 0 to \( F_1 \), the firm is spending more money on fundraising than it is making in contributions. Fundraising is costing the firm money; net contributions are negative. This is due to fixed costs and an inadequate fundraising program. An effective fundraising campaign will first require hiring personnel, purchasing office space, and buying materials. From \( F_1 \) to \( F_2 \) the firm would see gains from fundraising perhaps
due to economies of scale and highly interested and generous donors. Organizations should, at first, target people who are very interested in what the organization is doing and have money to give. In this range, contributions exceed fundraising expense. From $F_2$ to $F_3$, diminishing returns would set in because of reduced efficiency in fundraising within an organization. Also, eventually, less interested (or more frugal) donors might have to be targeted when a fundraising campaign grows. Over this range, net contributions would again become negative as the marginal cost of fundraising exceeds the marginal contribution but, returns are still positive. It is possible, however, that fundraising could proceed beyond $F_3$ and reduce total contributions if the firm bothers the donors to the point of irritation. Firms would not be in this region except by accident.

A service maximizing firm would operate at point N where the net revenue of the firm is maximized ($C(F) - F_2 = C_2 - F_2 = \Delta C$). To the left of $F_2$ the additional dollar spent on fundraising would induce more than one dollar in contributions. To the right of point $F_2$ the opposite would be true.

The budget maximizer would choose to operate at point T and spend $F_3$ on fundraising. This is where total contributions are the largest. The goal of such a firm is to become as large as possible (max total contributions). At no other point can the firm receive more donations.\(^{17}\)

\(^{17}\) The model explained above assumes organizations choose to solicit funds and are able to pick any level of fundraising expense that they desire. There are two situations in which this might not be the case. In such situations a corner solution might be optimal. First, it is possible that an organization might want to spend nothing on fundraising and receive $I$ in contributions; the intercept could represent the optimal
Additionally, a few assumptions are maintained throughout. Non-satiation applies to nonprofit groups. This means that constraints hold as equalities. Although nonprofits do partially control their own budget constraint through fundraising, it is doubtful that a nonprofit organization would ever be completely satisfied with its level of contributions. Extra contributions could always be spent or saved. Also, separability is assumed in inputs. Other variables influence fundraising’s productivity only through the location of the intercept and not the shape of the contribution function.

**Theoretical Model**

Assume, for simplicity, that fundraising is the only endogenous variable. The service maximizing organization would want to maximize the following equation where all variables are in dollars:

---

Allocation of fundraising dollars ($0 on fundraising). This would be the case if, for the service maximizer, the contribution function is always below the 45° line and, for the budget maximizer, if it is always below 1. Second, since nonprofit organizations operate with a budget constraint, it is possible that they cannot attain enough capital to reach their optimal allocation of funds. One would suspect such a capital constraint to apply only to small organizations who do not have enough collateral to obtain adequate financing. Corner solutions are not anticipated in this paper because all of the environmental groups spend a sizable portion of their budget on fundraising and are relatively large organizations—large enough to obtain substantial capital.
2) \( \max S \)
\[ \begin{align*}
\text{st.} \\
0 &\leq C + Z = S + F + M \\
C, Z, S, F, M &\geq 0 
\end{align*} \]

By substituting \( C + Z - F - M \) for \( S \) (and accounting for the fact that contributions are a function of fundraising) we have the following maximization problem:

3) \( \max C(F) + Z - F - M \)
\[ \begin{align*}
\text{st.} \\
0 &\leq C + Z = S + F + M \\
C, Z, S, F, M &\geq 0 
\end{align*} \]

Solving this maximization problem, the first order condition for fundraising implies \( \frac{dC}{dF} = 1 \) for the service maximizing organization.

For budget maximization, the organization wants to maximize total expenditure.

4) \( \max (S + F + M) \)
\[ \begin{align*}
\text{st.} \\
0 &\leq C + Z = S + F + M \\
C, Z, S, F, M &\geq 0 
\end{align*} \]

Again, substituting \( C + Z \) for \( S + F + M \), the budget maximizing problem is as follows:
5) \[ \max_{F} C(F) + Z \]

The first order necessary condition for this problem, with respect to F, implies that \( dC/dF = 0 \). Therefore, simply by observing \( dC/dF \) one should be able to determine the objective of the organization: \( dC/dF = 1 \) for service maximization when maximizing \( C(F) \) and \( dC/dF = 0 \) for budget maximization when maximizing \( C(F) \).

It is unrealistic, however, to say that fundraising is the only choice variable of nonprofit firms. The level of management and service expenditure are under the control of the firm and, as discussed in the literature review, should be important to the rational donor. To omit administration and service expenditure is to invite misspecification bias in the estimation of fundraising productivity. In addition, the coefficient estimates on service and management expenditure are of interest because they shed light on the objective of the nonprofit organization in the same way that fundraising does. This will be explained shortly.

An assumption in the model is that donors do not know the current level of a nonprofit’s service provision. In addition, there is little theoretical reason to believe that the value of a firm’s output is identically equal to the dollar cost of providing the services. Therefore, donors are assumed to estimate what a firm’s services are worth and donate accordingly. Available information is used by donors to estimate the value of current service expenditures. If an organization’s service provision diverges from donors’ desired service level, that organization is shirking in that it claims to be in existence to provide services for which donors are willing to pay.
Below is a more realistic model for a service maximizer.

6) \[
\max_{F, M, S} S
\]

\[st.
0 \leq C + Z = S + F + M
\]

As before, substituting \( C + Z - F - M \) for \( S \) and recognizing that contributions are a function of fundraising, management, and predicted services, the following maximization problem results:

7) \[
\max_{F, M, S} C(F, M, S_{\text{pred}}) + Z - F - M
\]

where
\( S_{\text{pred}} = \text{Donors ex ante evaluation of services.} \)

Since the organization chooses the various levels of spending on fundraising, services, and management to maximize their objective function, the following necessary first order conditions are implied for a service maximizer:

8) \[
\frac{\partial C}{\partial F} = 1
\]

9) \[
\frac{\partial C}{\partial M} = 1
\]

10) \[
\frac{\partial C}{\partial S_{\text{pred}}} \cdot \frac{\partial S_{\text{pred}}}{\partial S} = 0
\]

Equation 8 has been explained previously and is demonstrated in Figure 1 (point N). An organization maximizing net contributions would solicit contributions to the point where one dollar spent fundraising brings in one dollar of contributions.
That is exactly what equation 8 implies. The same is true for management costs. An organization would spend money on administration and overhead up to the point where the last dollar spent is offset by a dollar in contributions. Equation 10 implies that a service maximizing firm should spend money on additional service provision up to the point where donors no longer are willing to donate anything to the organization.  

This is true because if this value of $\frac{\partial C}{\partial S_{\text{pred}}}$ is negative, the firm would be better off saving some of the money it is spending on current services; marginal services are costing the firm money. If $\frac{\partial C}{\partial S_{\text{pred}}}$ is positive, the firm could do better by reallocating funds and spending more money on current services. A value other than zero would imply that the organization is not being cost effective, regardless of whether the firm is budget or service maximizing.

18 The value of $\frac{\partial S_{\text{pred}}}{\partial S}$ is taken to be approximately one. The assumption is that donors have rational expectations and will, over time, accurately predict actual services expenditures. However, this assumption is unimportant as long as $\frac{\partial C}{\partial S_{\text{pred}}}$ equals zero because the product of $\frac{\partial C}{\partial S_{\text{pred}}} \cdot \frac{\partial S_{\text{pred}}}{\partial S}$ would be zero regardless of the value $\frac{\partial S_{\text{pred}}}{\partial S}$. It is assumed, for simplicity, from this point forward that $\frac{\partial S_{\text{pred}}}{\partial S} = 1$.

19 Although equations 6 and 7 are of interest and will be estimated in the empirical section, it should be noted that the data on management and predicted services may not measure precisely what they are intended to represent in theory. Specifically, management expenditures may not be intended solely to bring in contributions. Management costs may have to diverge from optimal allocations in order to optimize fundraising and service expenditures. Additionally, the service variable is simply an instrument intended to capture donors perceived value of services. It may not be an exact measure (donor motivation is presently poorly understood). Although it is hoped that these variables capture the intended effects, they should be viewed with some caution in the remainder of the paper. Therefore, the fundraising variable will be of primary interest and management and services will be presented in support of the implications of the fundraising coefficient.
The budget maximizing organization's optimizing equation is:

11) \[
\max_{F,M,S} (S + F + M) \\
\text{St.}
\]
\[
0 \leq C + Z = S + F + M \\
C, Z, S, F, M, \geq 0
\]

Again, by substitution:

12) \[
\max_{F,M,S} C( F, M, S_{\text{pred}} ) + Z
\]

The appropriate necessary first order conditions for a budget maximizing firm are:

13) \[
\frac{\partial C}{\partial F} = 0
\]
14) \[
\frac{\partial C}{\partial M} = 0
\]
15) \[
\frac{\partial C}{\partial S_{\text{pred}}} \cdot \frac{\partial S_{\text{pred}}}{\partial S} = 0
\]

These first order conditions hold because all of the duties a firm performs will be carried out with an eye to the overall size of the organization. Everything will be designed to maximize total contributions.

Table 1 summarizes the necessary first order conditions for both service and budget maximization.
Table 1
Necessary First Order Conditions

<table>
<thead>
<tr>
<th>First Order Condition</th>
<th>Service Maximization</th>
<th>Budget Maximization</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\partial C/\partial F$</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>$\partial C/\partial M$</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>$\partial C/\partial s_{\text{pred}} \cdot \partial s_{\text{pred}}/\partial s$</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Dynamic Model

The dynamic structure assumed in this model differs from previous studies on the nonprofit sector. Weisbrod and Dominguez assumed that contributions are affected by lagged fundraising expense because they anticipated that there would be a delay between the time fundraising costs were incurred and the time contributions would result. They also did not include service or management as explanatory variables. Steinberg believed that fundraising and management expenditures would have both contemporaneous effects and lagged effects in his model. Thus both current and lagged fundraising and management were included in his model. Service expense had only a lagged effect because services, in his view, were the end result of a fundraising campaign.

In this thesis, it will be assumed that fundraising and management have effects only in the current time period. Given that the data used are annual, it is likely that people either respond to fundraising literature when it is received or they do not; donors either perceive the firm as being well managed or they do not. However, lagged effects of fundraising and management expenditures might occur if
donors look to earlier fundraising and management expense as a measure of the efficiency of a firm.\textsuperscript{20} This notion will be tested and results presented in chapter 5. Additionally, donors do not only look at last year’s service expense when anticipating this year’s services, they take other factors into account. Therefore, it is inappropriate to simply use previous services to anticipate donors’ expectations concerning current services.

The management of an organization presumably tries to attain some permanent goal. Therefore, in the service maximizing case, the firm is taken to maximize the net present value of service expenditure.

\begin{equation}
\begin{aligned}
\text{max } \Theta (S_1, \ldots, S_T) \\
\text{st. } \\
C_t + Z_t = S_t + F_t + M_t \\
t = (1, \ldots, T)
\end{aligned}
\end{equation}

where
\begin{align*}
\Theta &= \text{The present value of a finite horizon of service expenditures.}
\end{align*}

\textsuperscript{20} This was hypothesized by Rose-Ackerman (1982) and was discussed in the literature section. The theory was that fundraising and management expenses have lagged effects as a percentage of total budget. Presumably donors do not like excessive spending on fundraising and management.
The maximization for this problem is as follows:

\[
17) \max \Theta = \sum_{t=1}^{T} \left[ C_t( F_t, M_t, S_{\text{pred},t}) - F_t - M_t + Z_t \right] / (1 + r)^t
\]

where

\[
r = \text{marginal rate of time preference for a firm, } r > 0.
\]

Interestingly, the first order conditions do not change from the static model summarized in Table 1 (unless \( r \rightarrow \infty \)). However, there are now \( T \) of each first order condition.

\[
18) \frac{\partial C_t}{\partial F_t} = 1 \\
19) \frac{\partial C_t}{\partial M_t} = 1 \\
20) \frac{\partial C_t}{\partial S_{\text{pred},t}} \cdot \frac{\partial S_{\text{pred},t}}{S_t} = 0
\]

The budget maximizer is taken to maximize the size of the organization over its finite life.

\[
21) \max \gamma (S_1, \ldots, S_T, F_1, \ldots, F_T, M_1, \ldots, M_T) \\
\text{st.} \\
C_t + Z_t = S_t + F_t + M_t \\
t = (1, \ldots, T)
\]

\[
\gamma = \text{The present value of the finite horizon of budgets.}
\]
Therefore (unless $r \to \infty$):

$$
22) \max \gamma = \sum_{t=1}^{T} \left[ C_t(F_t, M_t, S_{pred,t}) + Z_t \right] / (1 + r)^t
$$

Again, for the budget maximizer the results in any given time period $t$ parallel those of the static model presented in Table 1 with $T$ first order conditions.

23) $\partial C_t/\partial F_t = 0$

24) $\partial C_t/\partial M_t = 0$

25) $\partial C_t/\partial S_{pred,t} \cdot \partial S_{pred,t}/\partial S_t = 0$

Table 2 summarizes the necessary first order conditions for budget maximization (equations 23-25) and service maximization (equations 18-20). Given that service maximizing conditions differ from those of budget maximizing, it is possible to determine what an organization is attempting to optimize.\(^{21}\)

\(^{21}\) This model may be somewhat simplistic in that it is possible that an organization may have a goal other than service or budget maximization (for instance membership maximization or a target growth level). Such a goal may be indistinguishable, in the model presented, from either budget or service maximization.
Table 2
Necessary First Order Conditions
Dynamic Model

<table>
<thead>
<tr>
<th>First Order Condition</th>
<th>Service Maximization</th>
<th>Budget Maximization</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\frac{\partial C_t}{\partial F_t}$</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>$\frac{\partial C_t}{\partial M_t}$</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>$\frac{\partial C_t}{\partial S_{\text{prod},t}} \cdot \frac{\partial S_{\text{prod},t}}{\partial S_t}$</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
CHAPTER 4

DATA AND VARIABLES

The Data

The data for the various nonprofit organizations used in this thesis were obtained from the first page of their IRS tax forms 990, a tax return that must be filed by tax exempt organizations. These tax returns are by law public information. I requested these tax forms for the years 1986-1992 from both the IRS and the environmental groups themselves (30 of them). Unfortunately, however, most environmental groups were unwilling to divulge their tax records, and the IRS does not keep these returns on file beyond seven years. Also, many of the tax returns that were requested within that period could not be located by the IRS. This created substantial holes in the time series for some groups and complete removal of others. The data set was, therefore, not symmetric in observations per group or in the specific years contained by each group. The final data set consisted of 94 observations from 20 environmental organizations as shown in Table 3.
## Table 3
Data Set

<table>
<thead>
<tr>
<th>Organization</th>
<th>Obs.</th>
<th>Average Total Revenue ($ 000)</th>
<th>Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nature Conservancy</td>
<td>5</td>
<td>238,780</td>
<td>1988-1992</td>
</tr>
<tr>
<td>Ducks Unlimited Inc.</td>
<td>3</td>
<td>59,386</td>
<td>1990-1992</td>
</tr>
<tr>
<td>Sierra Club</td>
<td>4</td>
<td>34,389</td>
<td>1987-1990</td>
</tr>
<tr>
<td>The Humane Society of the U.S.</td>
<td>6</td>
<td>17,472</td>
<td>1987-1992</td>
</tr>
<tr>
<td>People for the Ethical Treatment of Animals</td>
<td>5</td>
<td>8,024</td>
<td>1987-1991</td>
</tr>
<tr>
<td>GreenPeac International</td>
<td>6</td>
<td>7,336</td>
<td>1987-1992</td>
</tr>
<tr>
<td>Center for Marine Conservation</td>
<td>5</td>
<td>6,592</td>
<td>1988-1992</td>
</tr>
<tr>
<td>Defenders of Wildlife</td>
<td>6</td>
<td>4,854</td>
<td>1987-1992</td>
</tr>
<tr>
<td>Environmental Law Institute</td>
<td>3</td>
<td>3,615</td>
<td>1990-1992</td>
</tr>
<tr>
<td>Union of Concerned Scientists</td>
<td>5</td>
<td>3,512</td>
<td>1987-1991</td>
</tr>
<tr>
<td>American Rivers</td>
<td>6</td>
<td>1,477</td>
<td>1987-1992</td>
</tr>
<tr>
<td>Clean Water Fund</td>
<td>4</td>
<td>1,393</td>
<td>1989-1992</td>
</tr>
<tr>
<td>Rainforest Action Network</td>
<td>4</td>
<td>1,279</td>
<td>1989-1992</td>
</tr>
<tr>
<td>Rainforest Alliance</td>
<td>4</td>
<td>483</td>
<td>1988-1991</td>
</tr>
</tbody>
</table>
Many of the groups in table 3 have different fiscal years. Therefore, comparing tax returns for a given year between such organizations was inappropriate because, strictly speaking, they represent different time periods. To ameliorate this problem, the quarter in which an organization's fiscal year began was estimated. The other variables (in which quarterly numbers were possible) were then adjusted to coincide with the organization's accounting period. This was done in an effort to control for whatever small distortion that fiscal year differences might create. Also, all dollar values in the data set were deflated by the Consumer Price Index (CPI) obtained from the *Economic Report of the President* for various years.

**Variables**

The variables used in the estimation procedures are explained in this section. Contributions, fundraising, management, and service expenditures all came from the IRS tax form 990. Contributions was the dependent variable. The age of a firm was used as an explanatory variable.\(^{22}\) It is presumed that, *ceteris paribus*, the older an organization, the more contributions it will obtain. This was expected for a number of reasons. For example, the longer an organization is in place, the more effectively it will solicit contributions. Over time, an organization can adjust its list of potential donors to include only those that consistently give money. Additionally, it is probably easier to obtain repeat donations than to solicit new donations. The firm will therefore improve and increase its donor pool the longer it has been in

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\(^{22}\) Age was obtained from either Arnold and Gottlieb (1993) or Gifford (1990).
business. Finally, the older an organization, the more it will gain "brand recognition."

The square of age was also included to account for possible diminishing returns to age. The effect of age cannot increase without bound. In other words, an additional year should do more to improve the efficiency of a relatively new organization than it would an older, established firm. Therefore, the effect of being a year older, other things constant, should decrease through time. However, donors may perceive older firms as being more trustworthy or more likely to provide higher quality output. This would have a countervailing effect on diminishing returns. Therefore, \textit{a priori}, the sign for age squared cannot be predicted.

The unemployment rate was expected to have an inverse impact on contributions. It is doubtful that many unemployed workers are able to donate to environmental groups. As the unemployment rate increases, fewer people have surplus income to donate and, in general, donations to environmental organizations should decrease. The unemployment rate for full-time workers was used instead of the general unemployment rate because donating to environmental groups is, presumably, a luxury that part-time and seasonally employed workers do not have.\textsuperscript{23} These workers, though employed, still likely do not have extra income to donate. Although this was a generalization, it was hoped to be a slightly more accurate measure of the ability of the general public to donate to charities.

\textsuperscript{23} The unemployment rate for full-time workers was found in the Monthly Labor Review.
The year was included to account for any exogenous trends not otherwise explicitly included in the model that affect all organizations across time, such as changes in nonprofit laws or accounting practices. The year was not expected to have a big impact given the small time series, and its sign can not be predicted.

In addition to the variables presented above, fundraising as a percentage of total budget and management as a percentage of total budget were used in the final regression to determine whether these variables had an impact on contributions as hypothesized by Rose-Ackerman (1982) and Weisbrod and Dominguez (1986). They entered as lagged values to represent the assumption that donors do not know percentages of totals until the year is completed.  

One would also expect public attitude toward environmental causes to have an influence on contributions. However, public attitude is an extremely hard variable to quantify. Several proxies were attempted but were insignificant and difficult to interpret. They were, therefore, discarded.

It should also be noted that various other variables were tried in place of or in conjunction with the variables explained in the text. Such variables include the total population, per-capita disposable income, and gross domestic product. None of these variables were significant, added anything to the fit, or had any strong theoretical backing given the variables already in the model. In addition, an attempt was made to measure fundraising productivity (change in market share divided by the change in fundraising). It is assumed that the productivity of a fundraising campaign would have an impact on contributions. However a rather dubious number for the total dollar value of the environmental market and perpetual insignificance of the variable led to it being removed.

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CHAPTER 5

EMPIRICAL ESTIMATION AND RESULTS

The Pooled Procedure

The data set was pooled (cross-section and time-series), and therefore, the error process required special attention. Specifically, autoregression within each group and heteroskedasticity across groups needed to be eliminated to get a normal error structure.\(^{25}\)

To handle the error structure that pooled data presents, procedures outlined in Kmenta (1985, 615-35) were used. This process combines assumptions often made about cross-sectional data (heteroskedasticity) with those usually made for time-series data (autoregression). The steps in the pooled procedure are as follows.\(^{26}\)

\(^{25}\) OLS, autocorrelated, and GLS models were estimated. Each approach yielded results that did not fit with the economic theory discussed previously and none controlled for autoregression (within groups) and heteroskedasticity (across groups).

\(^{26}\) This is the same procedure used in Shazam under the pool command with the corcoef option. Shazam, however, requires that each cross-sectional unit have the same number of time-series observations so Shazam could not be used on the data set at hand. Therefore, a program was written to allow for the different numbers of observations per group in order to maximize the available data. It is comforting that the results obtained in Shazam on limited data sets match very closely the results obtained by the computer program.
1) Ordinary least squares was applied to the entire data set without distinction for cross-sections (organizations) or time-series (years). The results were used to calculate regression residuals.

2) From these residuals, consistent estimates of $\rho$ (rho—the autoregressive parameter) were obtained for each organization. To avoid the situation where rho exceeds one in absolute value (an explosive model), rho was calculated by the following equation.

$$\hat{\rho}_i = \frac{\sum e_{i,t}e_{i,t-1}}{\sqrt{\sum e_i^2} \sqrt{\sum e_{i,t-1}^2}} \quad (t = 2, \ldots, T; \ i = 1, \ldots, N)$$

where
- $t = \text{year}$,
- $i = \text{organization}$.

This yielded one value for rho per organization.

3) The variables in the regression were all transformed by the calculated values for rho.

4) Ordinary least squares was applied to the transformed data. The process yielded a new set of regression residuals.

5) These new residuals were then used to calculate the variance of each organization by
27) \[ s_i^2 = \frac{1}{T} \sum_{t=1}^{T} \hat{u}_{i,t}^2 \quad (i = 1, \ldots, N) \]

where

\[ \hat{u}_{i,t}^2 = \text{Estimated residual for observation } i,t, \]

\[ s_i^2 = \text{Estimated variance of organization } i.^{27} \]

6) The data was again transformed by the standard error (square root of the variance) calculated above.

7) Finally, ordinary least squares was applied to this final version of the data to yield the final results.

**Functional Form**

A linear approximation to the contribution function was used for three reasons. First, previous studies (Boyle and Jacobs (1978) and Steinberg (1982)) found nonlinear models hard to calculate and unsuccessful in improving the fit of the model. Second, it is simpler to interpret a linear model. For instance, in a log-log model the variable of interest, \( \partial C/\partial F \), is imbedded in the elasticity \( \partial C/\partial F \cdot F/C \) which is the estimated coefficient. Although this elasticity can be multiplied by \( C/F \) to obtain the desired derivative, the question is then, what value of \( C/F \) to choose (mean, median, mode, upper bound, lower bound)? This is a problem because the

---

27 The denominator for equation 27 in Kmenta (1985) is \( T-K \) ( \( K \) = the number of restrictions in the model). However, in this thesis, \( K \) exceeds \( T \) (the number of time-series observations per group) and, therefore, cannot be used. Instead, the maximum likelihood estimate, just using \( T \) in the denominator, is calculated.
value of C/F changes drastically from one group to another. Third, this data set was
not picked at random. The managements of all the environmental groups in the data
set have come under attack for putting self-interest above stated organizational
objectives. If such criticism is warranted, it is reasonable to assume that the
managements of these groups have a common objective, namely self-interest. This
may very well entail budget maximization. If the accusations of self-interested
behavior are false, then it is probable that these environmental groups have the goal
of maximizing services.\textsuperscript{28} In either case, if "the justification for the model is that
all firms search in the neighborhood of a common slope (objective function), the
linear form is appropriate" (Steinberg 1983, 197). For these reasons, a linear model
taking the pooled nature of the data into account was used in all of the regressions
that follow.

\textsuperscript{28} If these organizations are a mixture of budget and service maximizing firms, the
estimated coefficient $\partial C/\partial F_{\text{inst}}$ would be very imprecise because firms would be
operating across the entire feasible objective space (from 0 to 1). From the results, this
does not appear to be the case.
Model Specification

The basic model is as follows:

\[ 28) \quad C_{i,t} = \beta_0 + \beta_1 F_{i,t} + \beta_2 M_{i,t} + \beta_3 S_{\text{pred},i,t} + \beta_4 \text{AGE}_{i,t} + \beta_5 \text{AGE}^2_{i,t} + \beta_6 \text{UNEMP}_t + \beta_7 \text{YEAR}_t + \varepsilon_{i,t} \]

- \( i \) = individual organization
- \( t \) = year
- \( C_{i,t} \) = Contributions (dollars)
- \( F_{i,t} \) = Fundraising (dollars)
- \( M_{i,t} \) = Management (dollars)
- \( S_{\text{pred},i,t} \) = Donors estimated service (dollars)
- \( \text{AGE}_{i,t} \) = Age of organization \( i \)
- \( \text{AGE}^2_{i,t} \) = Age of organization \( i \) squared
- \( \text{UNEMP}_t \) = Unemployment rate
- \( \text{YEAR}_t \) = Time trend (in years)
- \( \varepsilon_{i,t} \) = Error term

The linear model in equation 28 makes it easy to calculate the derivatives of interest.

\[ 29) \quad \partial C/\partial F = \beta_1, \]
\[ 30) \quad \partial C/\partial M = \beta_2, \]
\[ 31) \quad \partial C/\partial S_{\text{pred},i,t} = \beta_3. \]

Endogeneity of Fundraising and Management

Endogeneity exists when there is joint dependency between the dependent variable and one or more of the right hand side variables in a model. It was likely that this was the case in equation 28. Given annual data, it was quite possible that
fundraising and management costs were affected by current contributions.

Contributions have to be spent somehow and, most likely, some of them were spent on fundraising and management activities. A Hausman specification test is typically performed when joint dependency is suspected. In such a test, the variable and the instrument for that variable are both placed in the regression. If the instrument has a significant effect, even in the presence of the original variable, then endogeneity is suspected. However, in this model, it was possible that joint dependency could exist and not be detected by a Hausman test. This was because if the instruments for fundraising and management (discussed below) were insignificantly different from zero, it would not necessarily mean that there was independence between these variables. Instead, it might suggest a budget maximizing situation. As discussed in chapter 3, a budget maximizing firm would attempt to maximize the total size of the organization, and this implies $\partial C/\partial F$ and $\partial C/\partial M$ equal zero; insignificance of the fundraising and management instruments (with respect to zero) might indicate budget maximization and not a lack of joint dependency. With this potential problem in mind, the results from the Hausman specification test are presented in Table 4.

---

29 Service costs were probably also jointly dependent with contributions. However, since it was predicted services ($S_{pred}$) and not services that enter into equation 28 and because this variable was calculated using exogenous information (equation 34), the problem of joint dependency between $S_{pred}$ and contributions has been automatically corrected.

Table 4
Endogeneity of Fundraising and Management

<table>
<thead>
<tr>
<th>Instrument</th>
<th>T-Stat</th>
<th>F-Stat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fundraising (critical value 95%)</td>
<td>-3.39</td>
<td>11.5</td>
</tr>
<tr>
<td></td>
<td>(≈2.00)</td>
<td>(≈4.00)*</td>
</tr>
<tr>
<td>Management (critical value 95%)</td>
<td>1.04</td>
<td>1.08</td>
</tr>
<tr>
<td></td>
<td>(≈-2.00)</td>
<td>(≈4.00)*</td>
</tr>
<tr>
<td>Joint dependence of Fundraising and Management (critical value 95%)</td>
<td>-</td>
<td>5.98</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(≈3.15)**</td>
</tr>
</tbody>
</table>

* with 1 D.F. in the numerator and 85 in the denominator
** with 2 D.F. in the numerator and 84 in the denominator

The Hausman test tended to support the idea that fundraising and management were endogenous. Tested jointly (by an F-test on their combined impact), fundraising and management appeared to be endogenous. A Hausman test was also performed on each variable separately. Fundraising alone appeared to be endogenous. Management, however, could not be rejected as independent from contributions.

Although the results of the Hausman test alone are not entirely convincing since management was not proven to be endogenous, joint dependency is still suspected. As mentioned above, annual data were used in this thesis and there was good reason to suspect that management and fundraising were jointly dependent with contributions. It is almost certainly true that some of an organization's contributions in a given year were spent on management and fundraising activities in that same year. In addition, the variables themselves were tried in place of the instruments and yielded results that were not in accord with economic theory. Therefore, on the
basis of intuition and the moderate strength of the Hausman specification test, instruments were used for fundraising and management.

Instrument Variables

The suspected endogeneity in the system makes a simultaneous approach necessary. A modified two-stage least squares (2sls) approach was chosen. In 2sls, the instruments for fundraising and management must first be created. This was done using the pool procedure outlined at the start of this chapter because these instruments must also be created from pooled data. Ignoring the potential for within group autocorrelation and between group heteroskedasticity could create biased instruments in the same way it could bias the results of the original regression. A pooled regression on equation 28 with the instruments described above (and presented explicitly in equations 32-34) in place of the actual fundraising and management values, was essentially 2sls. The only difference was that OLS is replaced with the pool procedure. In this pooled-2sls approach, instrument variables were created using all exogenous information in the original equation, in this case equation 28. The instrument for fundraising was:

\[ F_{it} = \beta_1 + \beta_2 \text{AGE}_{it} + \beta_3 \text{AGE2}_{it} + \beta_4 \text{UNEMP}_{t} + \beta_5 \text{YEAR}_{t} + \epsilon_{it} \]

31 A three stage least squared or seemingly unrelated approach would be appropriate if one were interested in the outcome of the instrument regressions. The interpretation of such regressions is not the goal of the thesis.
The predicted values of this regression functioned as the instrument for fundraising \( (F_{\text{inst},i,t}) \). These values replaced \( F_{i,t} \) in equation 28.

The instrument for management costs was made the same way but management was the dependent variable.

\[
33) \quad M_{i,t} = \beta_1 + \beta_2 \text{AGE}_{i,t} + \beta_3 \text{AGE2}_{i,t} + \beta_4 \text{UNEMP}_t + \beta_5 \text{YEAR}_t + \epsilon_{i,t}
\]

Again, the predicted value \( (M_{\text{inst},i,t}) \) replaced \( M_{i,t} \) in equation 28.

The predicted service variable \( (S_{\text{pred}}) \) was created in an identical fashion to the fundraising and management instruments, but it was created for a different reason. As explained in chapter 3, the assumption of the model was that donors do not know the value of this year's service provision and may never completely know what an environmental group has done. Therefore, they can only make an "educated guess" by using the information they have about an organization to predict the value of the services that the organization will provide. The sum of all donors predictions equals \( S_{\text{pred}} \). The managers of an organization would want to predict as closely as possible what donors expect, \( S_{\text{pred}} \), when making actual service expenditure decision. If managers diverge from \( S_{\text{pred}} \), they are ignoring the value donors place on services.

The value for \( S_{\text{pred}} \) was derived by using equation (32) with \( S_{i,t} \) (current year's services) as the dependent variable.

\[
34) \quad S_{i,t} = \beta_1 + \beta_2 \text{AGE}_{i,t} + \beta_3 \text{AGE2}_{i,t} + \beta_4 \text{UNEMP}_t + \beta_5 \text{YEAR}_t + \epsilon_{i,t}
\]

The predicted value of equation 34 was \( S_{\text{pred}} \).
By substituting these instruments (equation 32-34) into equation 28, we had the final equation.\textsuperscript{32}

\begin{equation}
C_{it} = \beta_0 + \beta_1 F_{\text{inst}\_it} + \beta_2 M_{\text{inst}\_it} + \beta_3 S_{\text{pred}\_it} + \beta_4 \text{AGE}_{it} \\
+ \beta_5 \text{AGE2}_{it} + \beta_6 \text{UNEMP}_{it} + \beta_7 \text{YEAR}_{it} + \epsilon_{it}
\end{equation}

where
\begin{itemize}
  \item $F_{\text{inst}}$ = the instrument for fundraising,
  \item $M_{\text{inst}}$ = the instrument for management,
  \item $S_{\text{pred}}$ = predicted services.
\end{itemize}

\textbf{Results}

The results of equation 35 are presented in Table 5 with the R-square for the instrument equations (32-34) presented at the bottom. The coefficients for the three variables of interest, the fundraising instrument, the management instrument, and the predicted services instrument are listed in Table 6, column 1. These are the same results as shown in Table 5 but are presented separately for emphasis and clarity. Accordingly, the last dollar an organization spends on fundraising brings in about $0.12 in contributions. Put differently, at the margin, an organization spends $8.33 fundraising in order to receive a dollar in donations. Similarly, the management coefficient (-.239) indicates that the marginal management dollar actually cost an organization $0.24 in potential contributions.

\textsuperscript{32} It is worth noting that multicollinearity was tested for and was not found to be serious in this model. Testing for multicollinearity involved both observation of the correlation matrices and matrix decomposition (as outlined in Judge, et al. 1982, 620-21). These tests were done on the instruments and the base model and in no case was multicollinearity found to be severe.
Table 5
Base Results

<table>
<thead>
<tr>
<th>Parameters Estimated</th>
<th>Base Results (t-stat)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependent Var. = Contributions</td>
<td></td>
</tr>
<tr>
<td>Adjusted R-square</td>
<td>.878</td>
</tr>
<tr>
<td>Fundraising instrument (F_{inst})</td>
<td>.117 (2.31)</td>
</tr>
<tr>
<td>Management instrument (M_{inst})</td>
<td>-.239 (-1.19)</td>
</tr>
<tr>
<td>Predicted Services (S_{pred})</td>
<td>-.098 (-.171)</td>
</tr>
<tr>
<td>AGE</td>
<td>.893 (3.37)</td>
</tr>
<tr>
<td>Age squared (AGE2)</td>
<td>-.007 (-2.95)</td>
</tr>
<tr>
<td>Unemployment (UNEMP)</td>
<td>-.674 (-2.99)</td>
</tr>
<tr>
<td>YEAR</td>
<td>.352 (1.97)</td>
</tr>
<tr>
<td>Constant</td>
<td>-4.49 (-1.03)</td>
</tr>
</tbody>
</table>

R-Square for Instruments Equations (32-34)

<table>
<thead>
<tr>
<th></th>
<th>R-squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fundraising</td>
<td>.505</td>
</tr>
<tr>
<td>Management</td>
<td>.714</td>
</tr>
<tr>
<td>Predicted Services</td>
<td>.426</td>
</tr>
</tbody>
</table>

Columns 2 and 3 of Table 6 indicate the implications of these results for budget and service maximization. The fundraising coefficient (.117) is both significantly different from zero and one. It does not strictly imply either budget or service
maximization. The coefficient on management is significantly different from one but not zero, a budget maximizing result. The marginal service dollar costs $0.10 in contributions. It is insignificantly different from zero as predicted for either a budget or service maximizing organization.

Table 6
Base Estimates
Coefficients of Interest

<table>
<thead>
<tr>
<th>Derivative</th>
<th>Coefficient (Column 1)</th>
<th>t-stat (from 0) (Column 2)</th>
<th>t-stat (from 1) (Column 3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\partial C/\partial F_{\text{inst}}$</td>
<td>.117</td>
<td>2.31</td>
<td>-17.5</td>
</tr>
<tr>
<td>$\partial C/\partial M_{\text{inst}}$</td>
<td>-.239</td>
<td>-1.19</td>
<td>-6.20</td>
</tr>
<tr>
<td>$\partial C/\partial S_{\text{pred}}$</td>
<td>-.098</td>
<td>-.171</td>
<td>-</td>
</tr>
</tbody>
</table>

The rest of the variables are exogenous to an organization and are listed in Table 5. Age is positive as expected and age squared is negative indicating diminishing returns to age of an organization. The coefficient on age (.893) means that the first year of a firm's existence is worth $893,000. However, because age squared is negative (-.007), this effect dies out over time. If the unemployment rate rises by one percentage point, it costs environmental groups $674,000 in contributions. Also, the time trend (not associated with the firm's own age) is worth $352,000. This trend is picking up any number of effects which are not explicitly specified in the model, for example, general changes in public attitude toward
environmental causes or changes in nonprofit accounting practices. The constant term is negative but insignificant.

The regression results presented in Table 5 indicate that the environmental groups in this study tend toward budget maximization and not service maximization. Management is significantly different from one and insignificantly different from zero. Fundraising is significantly different from both zero and one but closer to one. However, the fact that fundraising is not zero indicates that there may be some goal other than simple budget maximization in fundraising. Perhaps there is uncertainty or controversy within organizations about their fundraising objective or different organizations in the data set may have different objectives. More will be said about this shortly.

A couple of possible objections to the above results should be addressed. One might suppose that the fundraising done by an environmental organization is part of the service it provides. This could be because fundraising literature increases awareness about environmental problems and, therefore, is a service provided by an environmental organization. If we take the extreme case that all fundraising is in fact a service, we would hypothesize the following necessary first order conditions.

36) \( \frac{\partial C}{\partial (F_{\text{inst}} + S_{\text{pred}})} = 0 \) and

37) \( \frac{\partial C}{\partial M_{\text{inst}}} = 1 \) (for a service maximizer)

Equation 36 represents the total service provision of a firm by adding all fundraising and service costs up as one variable. The other variables in the regression remain
the same as in equation 35. The key coefficients for $\partial C/\partial (F_{\text{inst}} + S_{\text{pred}})$ and $\partial C/\partial M_{\text{inst}}$ are presented in Table 7.

**Table 7**  
Fundraising and Services Combined  
Coefficients of Interest

<table>
<thead>
<tr>
<th>Derivative</th>
<th>Coefficient (Column 1)</th>
<th>t-stat (from 0) (Column 2)</th>
<th>t-stat (from 1) (Column 3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\partial C/\partial (F_{\text{inst}} + S_{\text{pred}})$</td>
<td>0.154</td>
<td>2.82</td>
<td>-15.3</td>
</tr>
<tr>
<td>$\partial C/\partial M_{\text{inst}}$</td>
<td>-0.562</td>
<td>-3.76</td>
<td>-10.4</td>
</tr>
</tbody>
</table>

The coefficient for fundraising and services combined is 0.154 and is significantly different from zero. This indicates that organizations are not spending enough on current services. The coefficient for management is negative and significant suggesting neither budget nor service maximization. It would seem that with fundraising defined as a service, organizations are spending too much on management and not enough on services.

Another possible way of interpreting the fundraising, management and service variables was proposed by Steinberg (1983). He questioned whether the division between fundraising and management is as clear cut as it appears in the tax returns. It might be that there is overlap between fundraising and management activities. To test this, fundraising and management were added together to get a variable for total costs not directed to service provision, and the first order conditions are as follows:
38) $\frac{\partial C}{\partial (F_{inst} + M_{inst})} = 0$ (for a budget maximizer)  

$\frac{\partial C}{\partial (F_{inst} + M_{inst})} = 1$ (for a service maximizer)  

39) $\frac{\partial C}{\partial S_{pred}} = 0$.

Equation 38 replaces fundraising and management with total "overhead". No distinction between management and fundraising is made. The key results of this regression are presented in Table 8.

<table>
<thead>
<tr>
<th>Derivative</th>
<th>Coefficient</th>
<th>t-stat (from 0)</th>
<th>t-stat (from 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\frac{\partial C}{\partial (F_{inst} + M_{inst})}$</td>
<td>.121</td>
<td>2.71</td>
<td>-19.7</td>
</tr>
<tr>
<td>$\frac{\partial C}{\partial S_{pred}}$</td>
<td>.194</td>
<td>.386</td>
<td>-</td>
</tr>
</tbody>
</table>

The explanation of Table 8 is similar to that of the base regression (Table 5). Total overhead (fundraising and management costs), at the margin, results in $0.12 in contributions. This coefficient is significantly different from both one and zero implying, once again, conflicting objectives within an organization, between organizations, or an altogether different objective than either budget or service maximization. Service provision is insignificantly different from zero as before.

Since the results of the base model imply that these environmental organizations have mixed objectives, attempts were made to isolate differences among the groups or changes through time that might account for the apparent
mixed motivation. Specifically, four possibilities were postulated to identify
difference in behavior between groups: the size of an organization, the location of an
organization, the percentage of an organization's revenue received from contributions
(as opposed to revenue from the sale of goods or property), and changes in the
groups' behavior over time. Unfortunately, none of these models could identify any
differences with statistical precision. 33

Fundraising and Management Share

As discussed in the literature review, it has been hypothesized that the
percentage of resources devoted to fundraising and management might negatively
impact contributions. There is little evidence that this occurred. As shown in Figure
2, fundraising share, management share, and the combination of these two variables
(total share) are graphed in relation to total contributions. 34 None of the three have
any visual relationship with contributions. Nonetheless, they were added to equation
35, the base model, to test for significance. First, management share and fundraising
share were added. These shares are lagged one year to account for informational
delays. 35 The results of this regression are presented in Table 9.

33 The fact that these attempts were unsuccessful could be due to the limited size
of the data set or the relatively imprecise instruments created for fundraising,
management, and service provision (see the R-squares in table 5). However, if indeed
the groups are operating with a similar objective, it supports the use of a linear model
in this thesis.

34 All the numbers in figure 2 represent average values.

35 This is done to reflect the assumption that it takes donors time to acquire
knowledge about fundraising and management shares.
* Note - Organization 20 (Nature Conservancy) is truncated. The actual value = $138,000,000.

Organizations

1) Environmental Action
2) Rainforest Alliance
3) Rainforest Action Network
4) Clean Water Fund
5) American Rivers
6) Union of Concerned Scientists
7) Environmental Law Institute
8) Defenders of Wildlife
9) Center for Marine Conservation
10) GreenPeace Int.
11) Sierra Club Legal Defense Fund
12) People for the Ethical Treatment of Animals
14) Natural Resources Defense Council
15) Clean Water Action
16) Cousteau Society
17) The Humane Society
18) Sierra Club
19) Ducks Unlimited Inc.
20) The Nature Conservancy *
Table 9
Base Results With Fundraising and Management Share Included

<table>
<thead>
<tr>
<th>Parameters Estimated</th>
<th>Base Results (t-stat)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adjusted R-square</td>
<td>.925</td>
</tr>
<tr>
<td>Fundraising instrument (Finst)</td>
<td>.065 (1.42)</td>
</tr>
<tr>
<td>Management instrument (Minst)</td>
<td>-.287 (-1.94)</td>
</tr>
<tr>
<td>Predicted Services (S_pred)</td>
<td>.347 (.747)</td>
</tr>
<tr>
<td>Fundraising Share</td>
<td>.041 (1.02)</td>
</tr>
<tr>
<td>Management Share</td>
<td>-.042 (-1.29)</td>
</tr>
<tr>
<td>AGE</td>
<td>.937 (9.58)</td>
</tr>
<tr>
<td>Age squared (AGE2)</td>
<td>-.007 (-7.25)</td>
</tr>
<tr>
<td>Unemployment (UNEMP)</td>
<td>-.687 (-2.82)</td>
</tr>
<tr>
<td>YEAR</td>
<td>.296 (1.40)</td>
</tr>
<tr>
<td>Constant</td>
<td>-5.72 (-2.90)</td>
</tr>
</tbody>
</table>
It is interesting that including fundraising and management share slightly improves the overall fit of the model (r-square .925) as well as points to budget maximization since $C/\partial F_{\text{inst}}$, $C/\partial M_{\text{inst}}$, and $C/\partial S_{\text{pred}}$ all are insignificantly different from zero. The coefficients for management share and fundraising share are re-presented for convenience in rows one and two in Table 10. Row 3 of Table 10 presents the joint significance of fundraising share and management share from the regression presented in Table 9. Also, total share was included instead of fundraising and management shares in the base regression, equation 35, to see if the sum of the two shares (fundraising and management) had an effect on contributions. The coefficient on this total share is presented in row 4 of Table 10.

<table>
<thead>
<tr>
<th>Variable</th>
<th>T-Stat</th>
<th>F-Stat</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Fundraising Share</td>
<td>1.20</td>
<td>1.44*</td>
</tr>
<tr>
<td>2) Management Share</td>
<td>-1.29</td>
<td>1.66*</td>
</tr>
<tr>
<td>3) Joint Impact of Fund. and Man.</td>
<td>-</td>
<td>2.89**</td>
</tr>
<tr>
<td>4) Total Share</td>
<td>.085</td>
<td>.007*</td>
</tr>
</tbody>
</table>

* Critical F-Value $\approx 4.00$ at 95% (with 1 and 85 D.O.F)
** Critical F-Value $\approx 3.15$ at 95% (with 2 and 84 D.O.F)

It seems from Table 10 that fundraising, management, and the sum of the two, total share, are insignificant in determining contributions, as predicted by Steinberg (1983). That indicates that donors do not know or do not pay much attention to
fundraising and management share when making contributions decisions. It is possible, however, that the insignificance is due to the limited data set and the resulting lack of precision. It is also interesting that fundraising share has a positive sign indicating donors may respond positively to fundraising share. This was not anticipated and might indicate that fundraising has a longer impact than just one period. Despite the possible explanations for the insignificance of fundraising and management shares, these results are still insignificant. Therefore, the conclusion is that measures of inefficiency such as fundraising and management share do not significantly impact contributions.
CHAPTER 6

CONCLUSION

The intent of this paper has been to analyze the objective of many of the prominent environmental groups. The results show that these environmental groups behave more like budget maximizers than service maximizers, although the results are not conclusive; the coefficient on fundraising is neither strictly one nor zero. It is also possible that what appears to be budget maximization may represent some other objective that is not distinguishable through the results presented. For instance, organizations may attempt to achieve some optimal size or try to maximize membership. Such objectives may look like budget maximization. It was also tested whether donors respond negatively to higher percentage amounts fundraising and management costs. The answer seems to be no. Attempts to isolate differences in behavior among the groups in the data set proved ineffective. This lends support to the idea that these environmental groups are operating with the same objective.
Suggestions For Further Research

There are several drawbacks to this study that could be improved upon in future studies. First and foremost, the limited size of the data set (94 observations) is probably responsible for imprecision in both the base model and the instrument regressions. With a larger sample size, more accurate conclusions could probably be drawn regarding changes in behavior due to an organization's size, location, etc. Second, the specification of the model could be improved by including some measure of public attitude toward environmental causes. Several proxies for public attitude were tried. These proxies were discarded because they lacked explanatory power and were difficult to interpret. Third, the model could also be improved if a way were found to incorporate total market (indirect) effects. Nonprofit organizations do not operate alone, and there is a competitive market for donations. It may be that all firms in the environmental sector are competing with one another for limited donations. Therefore, in order to stay in business, an organization may be forced into what appears to be excessive spending on fundraising in order to keep pace with other groups. Alternatively, there may be a symbiotic relationship between groups. What looks like excessive fundraising by a

36 Membership numbers in selected environmental groups and the number of pages in the Conservation Directory (an annual listing of private and government organizations devoted to environmental issues), were used as proxies for public attitude toward environmental causes.

37 Total market effects were proposed by Rose-Ackerman and discussed in chapter 2.
single group when it is viewed individually may be optimal when the whole sector is taken into account. These are questions that could not be answered with the data at hand.\textsuperscript{38} 

\textsuperscript{38} Some effort was made to measure total market effects with a variable measuring change in market share. However, current market share is endogenous and extremely highly correlated with contributions and therefore drove the results. Attempts to formulate a decent instrument were ineffective.
BIBLIOGRAPHY
BIBLIOGRAPHY


