William & Mary
CHARTERED 1693

W&M ScholarWorks

Undergraduate Honors Theses | Theses, Dissertations, & Master Projects

4-2011

A Closer Look at Nonprofit Evaluation

Samanthe E. Tiver
College of William and Mary

Follow this and additional works at: https://scholarworks.wm.edu/honorstheses

 Part of the Economics Commons

Recommended Citation

Tiver, Samanthe E., "A Closer Look at Nonprofit Evaluation" (2011). *Undergraduate Honors Theses.* Paper 349.
https://scholarworks.wm.edu/honorstheses/349

This Honors Thesis is brought to you for free and open access by the Theses, Dissertations, & Master Projects at W&M ScholarWorks. It has been accepted for inclusion in Undergraduate Honors Theses by an authorized administrator of W&M ScholarWorks. For more information, please contact scholarworks@wm.edu.

A Closer Look at Nonprofit Evaluation

A thesis submitted in partial fulfillment of the requirement
for the degree of Bachelor of Arts in Economics from
The College of William and Mary

by

Samanthe Tiver

Accepted for _____
(Honors)

_____
Robert B. Archibald, Director

_____
Monica D. Griffin

_____
Melissa P. McInerney

Williamsburg, VA
April 21, 2011

INTRODUCTION

Today, 89% of American households donate to charity with a mean contribution of $1,620 (Independent Sector, 2001). In Virginia, there are 8,941 501(c)(3) charitable organizations who spent $27.4 billion in 2005 (Salamon, et al., 2009). The foundations alone hold over $7 billion in assets. The average charitable donation is $3,650 per household—about 6.0% of median income—significantly greater than the United States average of 3.0% (VANNO, 2008). This sector of the economy continues to grow; Virginia's nonprofit expenditures increased by 32% from 1998 to 2005 (Frumkin, 2001).

With 1.7 million volunteers, North Carolina nonprofit organizations provide more than 400,000 jobs, constituting almost 10% of all jobs (Corporation for National & Community Service; NC Center for Nonprofits). Together, they contribute $33 billion per year to the community through taxes on employees' salaries and consumption. This sector has been growing rapidly over the past decade, at an average rate of 11% per year (NC Center for Nonprofits). While North Carolinians don't give at the rate of Virginians, they still contribute 2.6% of their income, a donation of $1,238 per household per year.

Despite the growing impact of nonprofits throughout the world, few researchers have taken the opportunity to apply rigorous metrics to the nonprofit sector. As the demand for funding increases, however, donors seek ways of finding the most worthy organization for their donations. Many donors review nonprofit organization's overhead ratio as a proxy for success. The overhead ratio is the proportion of a nonprofit organization's total revenue that is spent on administrative and fundraising costs as opposed to programming efforts. The federal government even restricts their grant funding, such that only 15% can be spent on administrative costs and overhead (Nonprofit Overhead Cost Study Brief #3). Charity Navigator highlight the overhead

ratio in ranked lists, encouraging donors to give to organizations with low paid CEOs and discouraging donations to "inefficient fundraisers" (Charity Navigator). Grant making organizations often require recipients' overhead ratio to be between zero and eight percent (Hager, et al., 2005). Yet, what exactly is 'overhead ratio' measuring and what is an appropriate amount?

Policy Background & Literature Review

"Case Study"

Consider a small (fictional) nonprofit, Housing For All, whose mission is to provide affordable housing to low-income residents through new construction and renovation of existing buildings. Because they want to be competitive for government and other grants, they only will pay $30,000 to hire a new executive director. Someone with experience and a Masters of Business Administration could get hired at any other local business with a salary of at least $50,000. Housing For All settles for a woman with 20 years of experience and no formal education; she's the only one who can afford to live in the city on this low salary. The new executive director is responsible for managing volunteer groups, coordinating with contractors and other builders, selecting recipient families, running publicity and fundraising drives, as well as administrative tasks. Administration can take all day as the organization still uses desktop computers from the 90s and hasn't yet purchased a scanner. The executive director can choose to hire an administrative assistant, but as a small nonprofit, this would raise Housing For All's overhead ratio to 20%, well above the 15% government designation.

If Housing For All spent $100,000 more a year, they could hire an administrative assistant, an executive director with more formal education, and maybe invest in new computers

and infrastructure. What does this mean for programmatic outcomes? Will these investments result in sufficient increases in square footage developed? Unlike for-profit businesses, Housing For All cannot measure its success solely in profit, but how much of an increase in programmatic outcomes is enough to justify increased investments? Many of these questions remain unclear not only to researchers, but to the thousands of executive directors, nonprofit board members, and grant-making foundations seeking to provide high quality, diverse services to communities across the nation.

BUSINESS-BACKED THEORY

In for profit business, every dollar invested in administration is a dollar less in profit. This idea that dollars spent on administration are dollars 'lost' established the ideological background for the minimization of overhead ratio (Crutchfield 2007). For a nonprofit, every dollar on overhead is one less dollar going to 'help people' and so, donors should encourage the maximum amount of money to be spent on programs or the mission. However, for-profit businesses attempt to maximize returns to investors and recognize the investment in infrastructure and employees make increase profits well beyond the cost of employment. Still, charity watchdogs emphasize low overhead for nonprofit organizations, not maximization of revenue.

NONPROFIT THEORY

Several researchers of nonprofit management argue against the use of nonprofit overhead ratio as a measure of success and encourage donors to seek other more holistic measures of effectiveness (Hager and Greenlee 2004; Frumkin 2001). Yet, because of the easy access to nonprofit financial statistics and watchdog organizations such as Guidestar and Charity Navigator, overhead ratio has become the primary measure of success (Hager and Greenlee

2004). In a survey conducted in 1994, Glaser found that 82 percent of respondents considered *an adequate amount spent for program* to be important or very important in making a funding decision (Glaser 1994). In startling contrast a survey conducted by Princeton Survey Research Associates in 2001, only 6 percent of respondents considered *fulfills a genuine need or makes a difference* as their primary reason for giving to a nonprofit organization (PSRA 2001).

Researcher Dan Pallotta claims that nonprofit overhead ratio does not measure anything useful for donors (2008). His argument is that low overhead ratio does not indicate high quality performance, nor does high overhead inherently indicate low quality performance. Instead, overhead ratio is simply a mark of organizational structure and donors should be more concerned with measuring outcomes. Mark Hager and Janet Greenlee (2004) echo Pallotta's claims and further that overhead ratio has created a false "bottom line" for nonprofit organizations which only led to distortions and omissions. Today, many grant-making foundations and government grants still rely on overhead ratio as an accountability measure for nonprofit despite the many concerns.

THEORY

Researchers have been trying to better understand nonprofit effectiveness for years, with little progress (Herman 1990; Au 1996). The ease of measurement of the overhead ratio makes it an appealing tool for comparison, but only comparison between similar types of organizations result in meaningful conclusions (Weber 1994). Then one may ask, where do we derive the maximum percentage of overhead ratio? The answer remains unclear.

As aforementioned, the United States Government requires government grant recipients to spend 15 percent or less on administrative and infrastructure costs, many granting organizations specify that overhead must be between zero to eight percent, and charity watchdog

organizations suggest less than 25 percent (Nonprofit Overhead Cost Study Brief #3; Hager, et.al. 2005; Charity Navigator). Throughout professional literature, authors make claims of how the government should lower the maximum overhead ratio or make 100% of donations go to charity (Gregory and Stid 2009). Yet the current theoretical and empirical research does not seem to identify a clear optimal overhead ratio.

In 1999, the Urban Institute and Indiana University Center on Philanthropy began the Nonprofit Overhead Cost Study, performing surveys and empirical testing on overhead ratios. This five year study is the first large empirical study ever undertaken on overhead ratio. Researchers suggest that too little overhead was as much of a problem as too much overhead (Nonprofit Overhead Cost Study Brief #3). The authors found that lack of infrastructure led to problems such as limited grant eligibility, financial bookkeeping errors, and limited fundraising abilities.

The two largest factors which lead to poor infrastructure are small size and high levels of restricted funds. Government funding, in particular, led to low investment in overhead and therefore inadequate resources as government grants require extra administrative work to file the necessary data and paperwork. Additionally, low overhead ratio can lead to poor recruitment and retention of staff and an overworked executive director. Hager ,et al., suggest that policy makers increase the maximum level of overhead, but also recommend that watchdog organizations set a floor for overhead in order to encourage adequate infrastructure funding (Nonprofit Overhead Cost Study Brief #3). A clear definition of excess and insufficient does not exist in the literature.

HYPOTHESIS

The theoretical belief that low overhead should lead to increased efficiency and the empirical research that too little investment in administrative costs and infrastructure leads to

inefficiency implies a nonlinear relationship between overhead ratio and outcomes. If a nonlinear relationship is present, then there should exist an optimal level of overhead that would be most likely to produce the greatest level of outcomes. More simply, we expect that investing in overhead will at first create large increases in outcomes, but at some point, spending more on overhead will decrease programmatic outcomes. The following figure shows the expected relationship:

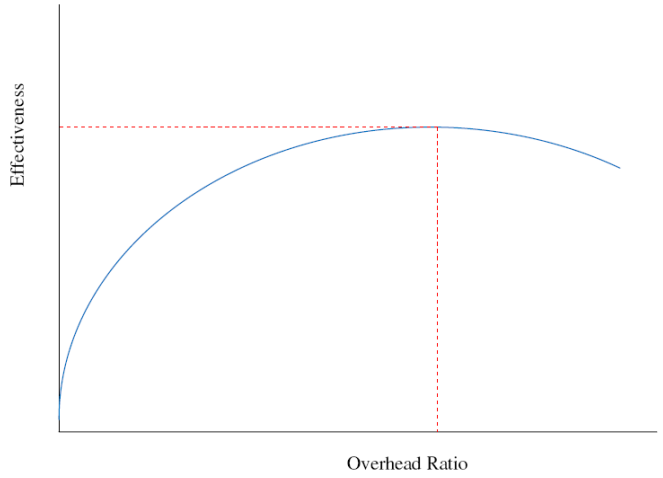

Figure 1. Expected relationship between overhead and outcome

Many nonprofit supporters object to nonprofit overhead ratio as a means of measurement, with very little empirical evidence. This research endeavored to examine the correlation between nonprofit overhead ratio and defined measures of effectiveness in the fields of affordable housing, food provision, and performing arts. However, due to low response rate and data distributions, we fully explored only the effectiveness of affordable housing organizations. From this, we identify an optimal ratio of overhead cost for this organizational sector by finding where the returns to increased overhead ratio are no longer positive. In other words, we expect to find a level of overhead ratio with enough spending on high quality management without excess waste on bureaucracy.

Because survey data is based on self-selection, we employ the Heckman model, which will be explored in more detail later. Simply, the Heckman model is a two step model which first uses probit to identify the probability an organization would respond and then uses maximum likelihood estimation to estimate the effects of the independent variables on programmatic outcomes. In the first part of the model, we use organizational characteristics as well as an exclusion restriction of 'state' to predict the likelihood of response. Secondly, we regress overhead ratio and its square on outcome data using basic econometric techniques while controlling for community characteristics and financial features of the organization. In this way, the regression will measure the effects of overhead ratio on outcome allowing for observing marginal effects.

DATA & METHODOLOGY

SAMPLE SELECTION

This research restricts the universe to only include nonprofit organizations within Virginia and North Carolina. This limits the breadth of the study and increase accuracy and specificity, as unobservable factors decrease with decreased variation in geography. North Carolina and Virginia have similar demographics of urbanization, wealth distribution, geography, and law (Census 2000). These similarities help to control for possible variations between organizations by governing body.

In order to define a dependent variable of outcomes, we decided to term successful outcomes as those defined by the goal-attainment approach of nonprofit evaluation. Under this method, researchers evaluated to what extent nonprofit organizations met their defined goals or missions. The assumption in measuring goal-attainment is that missions are clear, less

ambiguous and measurable and that no other factors except goal attainment affect organizational effectiveness (Forbes 1998, p.185-186).

We decided to focus on three organizational types whose missions have significant overlap and clearly defined and measurable outcomes. These include affordable housing developers, food providers to low-income individuals, and performing arts groups. Affordable housing organizations provide quality affordable housing to low-income families. Low-income food providers offer prepared and unprepared food to people at risk for hunger. Performing Arts organizations make available high quality arts, through education, performances, and other techniques. These organizations include, but are not limited to, dance, musical, and theatre.

Nonprofit organizations were identified based on their National Taxonomy of Exempt Entities Classifications Core Codes (NTEE-CC). NTEE-CC was developed by the National Center for Charitable Statistics and is employed by the Internal Revenue Service for reviewing nonprofit organizations (NCCS NTEE-CC Overview). Our categories were defined as:

Table 1. National Taxonomy of Exempt Entities Classification

Organizational Category	NTEE Category
Performing Arts	A60
Low-income food provision	K30
Affordable Housing Development	L20*

*As defined below, not all L20 organizations included.

'Performing Arts' (A60) contains the subgroups of dance, ballet, theater, music, symphony orchestras, opera, performing arts centers, singing & choral groups, bands & ensembles, and performing arts schools. All of these, and other categories, lie under the umbrella of Category A of 'Arts, Culture, and Humanities.' The category of 'Food Programs' (K30) includes the subcategories of food banks & pantries, congregate meals, soup kitchens, and meals on wheels. These are classified under 'Food, Agriculture, & Nutrition' (Category K). 'Housing

Development, Construction, & Management' (L20) includes low-income & subsidized rental housing, senior citizens' housing & retirement communities, independent housing for people with disabilities, & housing rehabilitation. Unlike the other two, more clearly defined categories, not all organizations within L20 are construction organizations and no one subcategory clearly dominates. Therefore, we filtered these organizations based on their mission to provide low-income housing and compared this list to the online databank via the Housing Association for Nonprofit Developers. These organizations largely identified as L25 (housing rehabilitation) and L20 generally. All Category L organizations are defined as 'Housing & Shelter' groups.

These organizations created the universe from which we gathered and analyzed our data.

Dependent Variable

The dependent variable, programmatic outcomes, exist as a measure of effectiveness for each organization. The definition of programmatic outcome varied based on organizational category, but did not vary within a given category. Affordable housing developers succeed by providing homes for low-income individuals. More quantifiably, their programmatic outcome is defined as square footage of housing provided from new construction or renovation. Low-income food providers supply meals to low-income individuals. This is measured by the number of prepared or unprepared meals served or distributed in 2008. Unprepared meals are 1.3 pounds of food as defined by the USDA guidelines for healthy consumption (Carlson, 2006).

Of these three categories, performing arts is the most difficult to define outcome measure because quality of performance and many other factors are not quantifiable. A successful performing arts organization could be those with the largest number of participants, the sold out shows, or the highest quality performance. We seek to encapsulate many of these aspects by

measuring effectiveness as the number of tickets sold. The magnitude of ticket sales captures frequency of performances and demand for performances, which are a function of both quality and organization size. While we recognize the challenges in capturing varied levels of quality, number of clients served, and value of their experience, these measurements provide quantifiable, comparable statistics which reflect the major themes in these organizations' missions.

These dependent variables were collected via opened ended surveys (Appendix) during August 2010. These surveys were mailed via US Postal service and included one self-addressed return envelope. For affordable housing organizations, we contacted 704 organizations and received 66 responses, a response rate of 9.38%. We mailed surveys to 152 food provision organizations and received 18 responses; a response rate of 11.84%.We contacted 517 performing arts organizations and received 69 usable results as well as 3 responses with non-numeric information, a response rate of 13.93%.

Table 2. Summary Statistics of Outcome by Category

Category	Obs	Mean	Std Dev	Min	Max
Performing Arts	69	14,909.55	37,272.65	136	282,573
Affordable Housing	66	6,860.273	13,629.37	520	63,216
Food Provision	18	5,793,458.132	16,491,335.23	0	70,5000,00

While food provision organizations did not have an abnormally low response rate, the significantly smaller universe limited the size of the respondent group. This small respondent group is insufficient for large econometric analysis and was dropped from further evaluation. We found that food provision organizations less often had competitors within their area and did not overlap provision territory as frequently as did organizations in other categories.

INDEPENDENT VARIABLES

Data on each nonprofit organization's overhead ratio, the independent variable, was purchased from the National Center on Charitable Statistics as the 2008 Core Files for public charities in Virginia and North Carolina. These data are an aggregation of all IRS Form 990 for Fiscal Year 2008 from nonprofit organizations in this region. Information includes total expenses, fundraising fees paid, revenue from service, revenue from public contributions, and salary of highest paid employee, among dozens of other financial and classification information.

An organization's decision to respond to a survey is largely dependent on its capacity to sort and read the letter, aggregate or access the necessary information, and return the survey in a timely fashion. Each of these steps requires employees' attention and time away from other work and toward administrative work. Therefore, organizations that respond are more likely to have higher capacity based on higher administrative costs. To identify this bias, we consider the variables of overhead ratio, salary of the highest paid employee, percentage of total revenue from public contributions, and whether or not the organization invested in professional fundraising. These values come from National Center for Statistics 2008 Core Files for Public Charities. Below, we list and define these independent variables:

Table 3. Independent Variables in Probit Model

Variable	Description	Definition
over	Overhead ratio: percentage of total revenue spent on administrative and fundraising costs	=EXPS/TOTREV
highsal	Salary of the highest paid employee of the organization	COMPENS
percont	Proportion of total revenue from public contributions	=CONT/TOTREV
solicit	Dummy variable for investment in fundraising	= 1 if hire professional fundraiser = 0 otherwise
state	State in which organization is located	= 1 if located in Virginia = 0 if located in North Carolina

Source: NCCS Data Web – Display Data Dictionary for Core 2008 PC file

Overhead ratio and high salary compensation both contribute to increased human or physical resources present at an organization. As more resources are available, the more likely it would be that an employee would have the time to read, research, and complete an academic survey. Therefore, we expect a positive relationship with probability of responding. As percentage of total revenue from contributions increases, the percentage of revenue from grants decreases and therefore the organization has greater freedom in their investment decisions. Thus, we expect increased percent received from public contributions to be correlated with increased probability of responding. An organization which has high enough revenues to hire a professional fundraiser would have more funds to hire administrative assistants and other resources. We expect a positive relationship between solicit and the probability of responding as well. Lastly, state acts as an exclusion restriction necessary to the Heckman model. This variable must influence the probability of an organization responding to the survey without affecting the programmatic outcome. Here, we use the state in which the organization is located as an indicator for an organization's familiarity with The College of William and Mary. We expect a positive relationship as organizations in Virginia would more likely recognize a state public university. We summarize the universe below:

Table 4. Summary statistics of Performing Arts Universe

Variable	Obs	Mean	Std. Dev.	Min	Max
Overhead ratio	517	.1391024	.2625646	0	2.506578
Percent of revenue from contributions	517	.3152749	.349085	0	5.316573
Highest salary paid	517	32866.7	98386.76	0	1100915
= 1 if hire professional fundraising = 0 otherwise	517	.0809249	.2729828	0	1
= 1 if in Virginia = 0 if in North Carolina	517	.4836224	.5002138	0	1

Table 5. Summary statistics of Affordable Housing Universe

Variable	Obs	Mean	Std. Dev.	Min	Max
Overhead ratio	704	.1389968	.226726	0	3.742931
Percent of revenue from contributions	704	.2340919	.3006134	0	1.091971
Highest salary paid	704	25307.13	87853.16	0	1106058
= 1 if hire professional fundraising = 0 otherwise	704	.0508475	.2198414	0	1
= 1 if in Virginia = 0 if in North Carolina	704	.474212	.4996926	0	1

Our independent variables seek to identify the relative weight between different organizational and community characteristics which affect the effectiveness of the organization. The financial characteristics include:

Table 6. Independent Financial Variables for MLE

Variable	Description	Definition from NCCS Data
OVER	Overhead ratio: percentage of total revenue spent on administrative and fundraising costs	=EXPS/TOTREV
OVERSQ	Squared overhead ratio	
PERCONT	Proportion of total revenue from public contributions	=CONT/TOTREV
HIGHSAL	Salary of the highest paid employee of the organization	COMPENS
SOLICIT	Dummy variable for investment in fundraising	=1 if hire professional fundraiser =0 otherwise

Source: NCCS Data Web – Display Data Dictionary for Core 2008 PC file

As our earlier stated hypothesis suggests, we expect a positive relationship with overhead ratio and a negative relationship with the square of overhead ratio. This identifies the diminishing marginal returns to investment in overhead. Similarly as explained above, percentage of revenue from contribution is expected to increase capacity. With increased capacity, we expect greater output and so we predict a positive relationship between percont and outcome. Likewise, investing in high quality employees increases the capabilities of an organization and so increases their ability to produce. Thus, high maximum salaries should correlate to increased outcomes. Lastly, an organization that invests in professional fundraising

would likely have money to invest in many opportunities. Thus, we expect a positive relationship.

Information regarding the communities surrounding these nonprofit organizations, such as percentage of urbanized area, is gathered from the U.S. Census Bureau from the American Community Survey (ACS) for 2008. The ACS is based on a random sampling of America and Puerto Rico and performed annually. These data are generalized to create data for every zip code in the nation on age, sex, race, education, cost of living, and housing. While the zip code is an imperfect measure of surrounding regions, this is the basic unit of Census bureau data and determining radiuses for many of the organizations could be difficult as their contact addresses are based on Post Office Box units. Below, these community variables are more clearly defined:

Table 7. Independent Community Variables for MLE

Variable	Description
perurban	Percentage of area within zip code designated as urban
perwhite	Percentage of population in zip code who identifies as 'white'
medianinc	Median income of zip code
competitors	Number of organizations within universe with same mailing address city

Many of the community characteristics are influential because of their relationship to need in a community. Urban communities with high populations of people with color are statistically more likely to have lower incomes (Census 2000). While it cannot capture this distribution of income, median income strives to grasp the overall wealth in a community. Nonprofit organizations, in particular those who provide services such as affordable housing, largely exist in and for lower income communities. Therefore, we expect more urban communities to demand more services, increasing output, and so, having a positive correlation to outcomes. Similarly, we expect that as the percentage of white population and median income

increase, the outcome of services provided will decrease. Finally, as the number of competitors rises, we expect the programmatic outcome to decrease as each organization shares only a part of the demand for their service or good in a community.

A summary of all of the above mentioned characteristics are as follows:

Table 8. Summary of Performing Arts Variables

Variable	Obs	Mean	Std. Dev.	Min	Max
Percentage of urban area in zip code	72	.7268056	.3355879	0	1
Percentage of white population in zip code	72	.6894444	.2280591	.13	.98
Number of competing organizations	72	3.763889	4.184118	0	18
Median income of zip code	72	41151.86	15934.54	11306	89862
= 1 if hire professional fundraising = 0 otherwise	72	.0809249	.2729828	0	1
Highest salary paid	72	32866.7	98386.76	0	1100915
Overhead ratio	72	.1391024	.2625646	0	2.506578
Squared overhead ratio	72	.0881563	.3942352	0	6.282933
Percent of revenue from contributions	72	.3152749	.349085	0	5.316573
= 1 if in Virginia; = 0 if in North Carolina	72	.1884058	.3939006	0	1

Table 9. Summary of Affordable Housing Variables

Description	Obs	Mean	Std. Dev	Min	Max
Percentage of urban area in zip code	66	.5568182	.3430594	0	1
Percentage of white population in zip code	66	.7278788	.1994108	.04	.98
Number of competing organizations	66	1.651515	3.88881	0	21
Median income of zip code	66	39122.5	13530.92	15779	89862
= 1 if hire professional fundraising = 0 otherwise	66	.0508475	.2198414	0	1
Highest salary paid	66	25307.13	87853.16	0	1106058
Overhead ratio	66	.1389968	.226726	0	3.742931
Squared overhead ratio	66	0.2492542	0.4441899	0	2.069391
Percent of revenue from contributions	66	.2340919	.3006134	0	1.091971
= 1 if in Virginia; = 0 if in North Carolina	66	.5081967	.5040817	0	1

CHALLENGES

Upon examining these data, one may notice overhead ratios greater than 100% or organizations with zero expenses or revenue. Many nonprofits do not possess the resources to thoroughly complete their Form 990s and misrepresent the actual numbers by including programming costs as administrative costs, not accounting for all revenue, or simply writing inaccurate numbers (Froelich, Knoepfle, & Pollack, 2000). Froelich, Knoepfle, and Pollack (2000) have found the Form 990 to be an overall reliable and adequate source of data to analyze nonprofits, while simultaneously containing flaws from uninformed preparers of these documents.

In our data, 17 performing arts organizations report overhead ratios greater than 100% and only 5 affordable housing organizations report overhead ratios greater than 100%. As displayed in the results section, dropping these variables does not alter the relationship or statistical significance of any of the estimated coefficients in the Heckman model. However, due to the sensitivity of ordinary least squares (OLS) regressions to outliers, we drop these observations in these exploratory regressions.

THE HECKMAN MODEL

SELECTION BIAS

When handling survey data, one must consider what affects the organization's choice or ability to respond to a survey. We examine the similarities and differences between our respondents and the universe of possible respondents. Considering both housing and performing arts, the mean revenue (derived from programmatic revenue, the sale of goods, and contributions) is greater in the universe than in the sample of respondents. Thus, respondent organizations are smaller, on average. Contrastingly, the highest salary given by the organization and the percentage spent on overhead are higher for organizations in our sample than the entire

universe. This suggests that while the respondents may not be the largest organizations, they do spend more than average investing in administrative costs. These findings suggest that our sample is not representative of the universe and therefore there may be systematic differences in the organizations which choose to respond. Below, we highlight the difference between respondents and the universe:

Table 10. Comparing Respondents to Universe

	Housing		Performing Arts	
Variable	Sample	Universe	Sample	Universe
Total revenue	660,655	1,583,786	731,929	969,507
Overhead ratio	0.357	0.116	0.455	0.089
Percent of revenue from contributions	0.507	0.206	0.449	0.293
Highest salary paid	32,681	24,549	96,728	22,580
= 1 if hire professional fundraising = 0 otherwise	0.257	0.029	0.263	0.051
Percent of revenue from sale of goods	0.081	0.021	0.003	0.003

While these data demonstrate the significant differences between our sample and the universe, these differences indicate the systematically varied capacity between these organizations as similar patterns hold between organizational types. The respondent organizations are below average in size, as measured by total revenue, yet provide above average wages to their highest paid worker and are more likely to have paid a professional fundraiser. These organizations received, on average, a greater proportion of their revenue from public donations and equal or greater from goods. Therefore, the organizations from the universe are more likely rely on government and other grant funding to run their organization. Some of these funding streams maintain strict guidelines on overhead ratio that can restrict capacity (Nonprofit Overhead Cost Study Brief #3). If responding to surveys is any predictor for capacity, then these trends reflect those seen in other studies, such as NCCS's "Getting What We Pay For," where

researchers witness significantly lowered abilities, infrastructure, and competitiveness among government grant recipient organizations.

Traditional maximum likelihood estimation assumes that the given sample is representative and therefore information about these organizations can be extended and applied as an image of the entire universe. This fundamental assumption has been violated here as demonstrated above.

MODEL

We employ a Heckman sample selection model to identify and correct sample selection bias. This model uses two steps: First, we estimate a probit model to determine the probability that a given organization would respond to the survey based on the financial characteristics of the organization. Second, we estimate maximum likelihood estimation for the continuous portion of the data to predict a given organization's observed outcome.

The Heckman model is based on James Heckman's 1976 article on "the common structure of statistical models" which explores models for truncation, sample selection, and limited dependent variables (Stata Corporation). This model assumes there exists the relationship of

$$y_j = \mathbf{x}_j\boldsymbol{\beta} + u_{1j}$$

as the regression equation of interest. Because the dependent variable is not always observed, Heckman calculates characteristics for which predict the likelihood of observing a dependent variable. The model assumes that for observation j the dependent variable will be observed if

$$\mathbf{z}_j\gamma + u_{2j} > 0.$$

where $u_1 \sim N(0,\sigma)$

$u_2 \sim N(0,1)$

$corr(u_1,u_2) = \rho$

When $\rho \neq 0$, then standard maximum likelihood would result in biased results because of this non-random error distribution. These assumptions are difficult to check, as they're based in functional-form and theories of interest to this study. Still, it seems logically consistent and visible in the data that organizations do not have an equal likelihood of responding and therefore, the model must be examined with an understanding of this non-random error term. Thus, we employ the probit and MLE combined two-step approach.

RESULTS

We specify identical models for both organizational categories. We consider factors that influence capacity, overhead, highest salary, portion of revenue from public, and professional fundraising, when determining the probability that a given organization will respond and complete the survey. And we identify community factors of urbanization, racial demographics, income, and competitors as well as organizational characteristics of overhead, highest salary, portion of revenue from public, and professional fundraising, for predicting the reported programmatic outcome of each organization. First, we examine performing arts data. Upon first attempt, the data for performing arts organizations did not converge and therefore could not be estimated using maximum likelihood estimation. Yet, the Heckman model has two methods a single step method, the standard method, and a two step method, a procedure developed for large sized data sets. Evaluating the data for performing arts using a two-step Heckman model, the estimators for the probability of responding are shown below:

Table 11. Heckman Probit Estimation for Performing Arts Organizations

Select	
Overhead ratio	2.1804
	(0.3835)***
Highest salary paid	8.13e-07
	(8.98e-07)
Percent of revenue from contributions	0.3144
	(0.1880)**
= 1 if hire professional fundraising	-0.0248
= 0 otherwise	(0.3142)
= 1 if in Virginia	-0.6262
= 0 if in North Carolina	(0.1716)***
constant	-1.4228
	(0.1389)***

Standard errors in parentheses.
*p<.10;** p<.05; *** p<.01.

Overhead ratio and percentage of revenue from contributions both exhibit significant, positive effects on the probability an organization would respond to a survey. Highest salary explains almost zero effects and fundraising investment may exhibit negative relationship to response, yet both of these show very little significance. An organization located in Virginia is actually less likely to respond to the survey and this coefficient holds strong statistical significance.

Table 12. Two-Step Heckman Estimation for Performing Arts Organizations

Variable	Coefficient
Outcome	
Percentage of urban area in zip code	-7076.421
	(17365.49)
Percentage of white population in zip code	30503.93
	(26799.71)
Median income of zip code	-0.1337
	(0.3690)
Number of competing organizations	-357.9615
	(1347.564)
Overhead ratio	61693.16
	(55947.31)

Squared overhead ratio	-18728.67
	(19013.81)
Highest salary paid	-0.0002
	(0.0361)
Percent of revenue from contributions	-2943.312
	(19022.27)
= 1 if hire professional fundraising	-277.7153
= 0 otherwise	(16710.43)
constant	-48215.69
	(53798.63)

Standard errors in parentheses.
*p<.10;** p<.05; *** p<.01.

As seen above, many of the estimated coefficients for predicting the outcomes for a particular organization are deemed insignificant. Beyond this, none of the estimated coefficients for the MLE model for outcome hold significance. In fact, the lowest p-value is 0.571. While these estimations show hints of our expected relationships, with positive returns to overhead with decreasing marginal effects, the results are so insignificant that we cannot infer any information from them. After the failure of the one-step Heckman model, these insignificant outcomes were expected.

Affordable Housing organizational data can be measured more precisely than arts data because their goal-attainment measurement of square footage is more often recorded and very clearly connects to each organization's mission. Other systemic variations exist between affordable housing organizations and performing arts organizations. For example, housing organizations often work with lower income communities than performing arts organizations. And, as demonstrated in our data, the overhead ratio for both types of organizations have comparable means, but performing arts organizations cover a much broader spectrum.

Performing arts is less standardized in their approach to providing quality arts than affordable housing organizations are in providing housing.

Seen below, we include the estimators involved in predicting an affordable housing organization's probability of responding and the same regression with robust standard errors calculated for comparison:

Table 13. Heckman Probit Estimation for Affordable Housing Organizations

Select		
	Probit Model	Probit Model without outliers
Overhead ratio	0.7880	1.7420
	(0.1111)***	(0.2703)***
Highest salary paid	3.34e-07	-1.81e-07
	(3.31e-07)	(3.71e-07)
Percent of revenue from contributions	1.3515	1.3723
	(0.1539)***	(0.1571)***
= 1 if hire professional fundraising	0.8497	0.6795
= 0 otherwise	(0.1947)***	(0.2220)***
= 1 if in Virginia	-0.0012	-0.0012
= 0 if in North Carolina	(0.0002)***	(0.0002)***
constant	-2.0819	-2.2234
	(0.1373)***	(0.1641)***

Robust standard errors in parentheses.
*p<.10;** p<.05; *** p<.01.

Affordable housing organizations experience increased probability to respond when overhead is high, the highest salary is high, the percentage of revenue from public contributions is great, and professional fundraisers are hired. Again, organizations are less likely to respond if located in Virginia than North Carolina. This outcome is different than expected. Even though this figure is statistically significant, the impact is small with a comparative increase of only 0.12%. Of these, all are statistically significant with $p<0.01$ except the salary of the highest paid employee which is not statistically significant.

Below, we demonstrate the importance of the sample selection model in determining the underlying coefficients and walk through the process and determining an optimal overhead ratio. First, we performed a linear regression on outcome with overhead ratio and all other community and financial covariates. As conventional wisdom suggests, increasing overhead ratio decreases programmatic effectiveness. However, when the square of overhead ratio is included, the results are not so clear. The square of overhead ratio reveals the marginal effects of increasing overhead. Even within the restraints of a linear model, overhead ratio increases programmatic outcomes at a decreasing rate. When we enhance the model to allow for nonlinear relationships as well as control for selection bias, we find that there is indeed a point at which overhead ratio no longer improves programmatic outcomes, but rather is harmful. Lastly, we include the Heckman maximum likelihood estimated model with and without outliers to establish how this change does not strongly impact the estimated coefficients and does not impact the statistical significance for any variable.

Here, we show the estimated coefficients for predicting programmatic outcomes for success:

Table 14. Two-Step Heckman Estimation for Affordable Housing Organizations

Variable	OLS Model 1	OLS Model 2	Heckman MLE	Heckman MLE without outliers
Outcome				
Percentage of urban area in zip code	-12196.48 (6504.113)*	-12235.65 (6141.68)	-211.9165 (0.0005)***	-211.9163 (0.0006)***
Percentage of white population in zip code	-5301.848 (9436.52)	-5035.533 (9162.665)	-398.0881 (0.0034)***	-398.0894 (0.0010)***
Median income of zip code	0.1536 (0.1618)	0.1795 (0.1598)	-0.0035 (4.03e-08)***	-0.0035 (1.63e-08)***
Number of competing organizations	296.3808 (544.3356)	506.5898 (452.2575)	-11.9949 (0.0001)***	-11.995 (0.0002)***
Overhead ratio	-11778.52	12833.23	14073.71	32429.29

	(7009.255)*	(22361.37)	(3273.974)***	(4825.246)***
Squared overhead ratio	--	-30740.52	-1121.213	-1121.211
		(24612.59)	(0.0081)***	(0.0029)***
Highest salary paid	0.0030	-0.0209	0.0018	-0.0075
	(0.0357)	(0.0374)	(0.0061)	(0.0069)
Percent of revenue from	-2408.127	-3379.97	23509.08	24971.31
contributions	(7075.609)	(6614.939)	(3834.243)***	(4097.169)***
= 1 if hire professional	6553.195	6513.739	15115.27	12629.1
fundraising	(7611.213)	(7429.146)	(3761.247)***	(4544.128)***
= 0 otherwise				
constant	14539.24	11695.33	-35032.45	-39318.32
	(11548.74)	(11249.26)	(4247.13)***	(4175.564)***

Robust standard errors in parentheses.
*p<.10;** p<.05; *** p<.01.

In predicting programmatic outcome, every community characteristic is negatively related to outcome. So, increased urbanized relates to decreased outcome, increased white population relates to decreased outcomes, higher median income explains a very small decrease in outcome, and more competitors explains a significant decrease in outcomes. Percentage of revenue from public contributions explains an increase in outcomes as the percentage increases and an organization which invests in professional fundraising exhibits higher outcomes on average. Overhead, most importantly, is positively correlated to increased programmatic outcomes with decreasing marginal returns as increases the square of overhead explains decreases in outcomes. Lastly, while the highest salary holds a positive coefficient, this estimation holds no statistical significance.

A simple test for heteroskedasticity is not possible with the Heckman model; therefore, we compare the difference between our standard model and a robust calculation. We find that with the robust calculation, while there are changes in the standard errors, there are no changes in the significance of any estimated coefficients. With such interrelated concepts and information, a

discussion of endogeneity is necessary. The challenge of endogeniety exists because estimation of coefficients rests on the assumption that the variables are independent of the error term.

One of the assumptions of maximum likelihood estimation is the independence of the variables. With no accurate way to test this assumption, we examine the correlations between the variables to identify any strong relationships. As seen below, the correlation between the variables is fairly low with the greatest relationship between overhead and its square, as expected.

Table 15. Correlations between independent variables

	perurban	perwhite	medianinc	competitors	over	oversq	highsal	percont	solicit	state
perurban	1.0000									
perwhite	-0.4232	1.0000								
medianinc	0.0270	0.4149	1.0000							
competitors	0.3824	-0.5487	-0.2673	1.0000						
over	0.1833	-0.1383	0.0382	0.2897	1.0000					
oversq	0.1492	-0.1110	0.0204	0.2312	0.9432	1.0000				
highsal	0.3132	-0.1768	0.3610	0.1099	-0.0335	-0.1647	1.0000			
percont	-0.3281	0.0487	-0.1286	-0.2186	-0.0752	-0.0757	-0.0363	1.0000		
solicit	0.2365	-0.1845	0.0869	0.4033	0.6844	0.6466	-0.0476	-0.1769	1.0000	
state	-0.0865	0.0654	0.2043	-0.2899	-0.2329	-0.2712	0.1484	0.2835	0.2556	1.0000

This model performs well in likelihood ratio tests as the overall model receives a likelihood ratio of 97.9, implying a p<chi2 of 0.0000. Similarly, the likelihood ratio test for independent equations, meaning that there is no difference between the respondent sample and the entire group, has a p-value of 0.0000 as well. We also test for joint significance between the overhead ratio and its square, finding them to be statistically significant at p>chi2 of 0.0000.

OPTIMAL OVERHEAD RATIO

After defining the probit portion of the model, the remaining information is a maximum likelihood estimation. Below, we calculate the optimal overhead based on estimated coefficients from our calculations for affordable housing organizations. For the sake of clarity, we represent this relationship through a linear model as follows:

$$\text{Effectiveness} = \beta_0 + \beta_1(\text{perurban}) + \beta_2(\text{perwhite}) + \beta_3(\text{medianinc}) + \beta_4(\text{competitors}) + \beta_5(\text{over}) + \beta_6(\text{oversq}) + \beta_7(\text{highsal}) + \beta_8(\text{percont}) + \beta_9(\text{solicit})$$

In order to find the maximum of this equation, we take the derivative with respect to overhead ratio (over) and solve for when the equation equals 0. At this point, the slope with respect to overhead is flat, at the top of a parabola.

$$0 = \beta_5 + 2 \cdot \beta_6(\text{over})$$

We solve for overhead ratio (over) to make the calculation:

$$\text{over} = -\beta_5 / 2 \cdot \beta_6(\text{over})$$

We can substitute our estimated coefficients from our model and find:

$$\text{over} = -32{,}429.29 / (2 \cdot -1{,}121.211) = 0.1446$$

We find the optimal overhead ratio to be around 14.5%. This is fairly in line with the existing guidelines for government grantmaking, but falls above many guidelines set forth by watchdog organizations. One may note that the above overhead ratio is calculated without outliers because we lack sufficient data to estimate optimal overhead at this extreme end of the spectrum. Should these observations be included, the optimal ratio drops to 6.3%. This drastic difference after removing only 5 observations demonstrates the sensitivity and variability of this estimation.

Future estimations with larger sample sizes, more diverse organizational types, and more complex calculations could produce a more reliable estimate.

DISCUSSION

Overall, this model seems to have successfully supported our hypothesis that overhead ratio is correlated to programmatic outcomes, and both too little and too much overhead can inhibit these outcomes. While this research helps to begin a path toward more informed nonprofit funding, many more questions remain unanswered.

First, the programmatic outcomes for performing arts organizations vary largely in expected quality (from elementary school ballet to Symphony Orchestra). While we sought to capture this information through ticket sales, this requires assuming the only factors to influence an individual's choice to attend a performance are price and quality. One may suggest they go because a relative or friend is in the production, even this as providing recruitment for attendance and number of individuals impacted by the organization can be helpful information. Yet, what happens when an individual wants to attend the performance but no seats remain? The number of tickets sold may simply be a function of the size of the venue. Because of these many factors, tickets are the best, but imperfect measure, and likely contributed to the difficulties in modeling this data.

Once the performing arts data did not converge or produce significant results, we lost the ability to compare results across organizational types. This weakens the generalizability of the results. Because we cannot ensure that identical patterns for prediction of programmatic overhead exist in other organizational categories, we cannot simply apply these findings to every organization, but rather need to study this further. For example, while the mean of overhead ratio

was comparable between performing arts and housing organizations, the range of overhead was greater for performing arts organizations with a standard deviation of 0.26 compared to 0.16 from housing. We must caution policymakers and donors from using this guideline as a general rule for all nonprofit organizations. We instead encourage similar studies of larger regions and more organizational categories to help create guidelines which fit the organizational type better and highlight any larger patterns within nonprofit organizations.

This model, because of its quantitative nature, only pertains to organizations which can satisfy goal-attainment missions. These missions must be measurable and consistent between organizations. One can imagine many organizations that cannot fit this mold such as disaster relief or education organizations.

CONCLUSION

From this research, we find that investing in infrastructure increases capacity, as measured by ability to respond, and effectiveness, as measured by programmatic outcomes. Individual donors, grant-making foundations, and government agencies should consider their goals in selecting recipient organizations and may want to support organizations who partake in the long process of developing high quality infrastructure. Rather than strictly limiting an organization's overhead ratio, funders should allow organization's overhead to increase to invest in necessary improvements like qualified employees. Government agencies already allow nonprofit organizations to spend up to 15% of their funding on administrative costs and they should continue to do so. Future research should consider a broader range of nonprofit organizations to see if this optimal overhead ratio of 15% fits more organization types than affordable housing. Donors should discourage charity organizations to simplify organizational

comparisons and rankings to rewarding low overhead, without regard to quality of service and effectiveness.

The issue of nonprofit evaluation is complicated and only starting to be understood. This research should empower and caution practitioners to take the risks to invest in their organizations, while maintaining their focus on programmatic outcomes and accomplishing their mission. We hope to call researchers to examine these issues more fully to improve our communities with efficient and effective nonprofit services.

WORKS CITED

Au, C. (1996). Rethinking organizational effectiveness: Theoretical and methodological issues in the study of organizational effectiveness for social welfare organizations. *Administration in Social Work, 20*(4), 1.

Carlson, A., Lino, M., Juan, W., Hanson, K., & Basiotis, P. P. (2007). *Thrifty food plan, 2006* No. CNPP-19)Center for Nutrition Policy and Promotion U.S. Department of Agriculture. Retrieved fromhttp://www.cnpp.usda.gov/Publications/FoodPlans/MiscPubs/TFP2006Report.pdf

Charity Navigator. (2011). *America's largest charity evaluator.* Retrieved 10 Apr, 2011, from http://www.charitynavigator.org/

Corporation for National & Community Service. (2008). *North carolina profile - volunteering in america.* Retrieved 8 April, 2011, from http://www.volunteeringinamerica.gov/NC

Crutchfield, L., & University).,Fuqua School of Business Duke. (2008). *Forces for good : The six practices of high-impact nonprofits* (1st ed. ed.). San Francisco: Jossey-Bass.

Forbes, D. (1998). Measuring the unmeasurable: Empirical studies of nonprofit organizational effectiveness. *Nonprofit and Voluntary Sector Quarterly, 27*(2), 183-184-202.

Froelich, K. A., & Knoepfle, T. W. (1996). Internal revenue service 990 data: Fact or fiction? *Nonprofit and Voluntary Sector Quarterly, 25*(1), 40.

Frumkin, P. (2001). Going beyond efficiency. *Nonprofit Quarterly, 8*(2)

Glaser, J. (1994). *The united way scandal: An Insider's account of what went wrong and why*. New York, NY: John Wiley & Sons, Inc.

Gregory, A. G., & Stid, D. (2009, How government can spur charity performance. *Philanthropy*, Retrieved from http://philanthropy.com/article/How-Governments-Can-Spur-High/57677/

Hager, M., & Greenlee, J. (2004). How important is a nonprofit's bottom life? the uses and abuses of financial data. In P. Frumkin, & J. B. Imber (Eds.), *In search of the nonprofit sector* (1st ed., pp. 85-86-96). New Brunswick, NJ: Transaction Publishers.

Hager, M., Pollak, T., Rooney, P., & Wing, K. (2005). Paying for not paying for overhead. *Foundation News and Commentary*, *46*(3)

Herman, R. (1990). Methodological issues in studying the effectiveness of nongovernmental and nonprofit organizations *Nonprofit and Voluntary Sector Quarterly*, *26*, 185-186-206.

Independent Sector. (2001). *Giving and volunteering in the united states*, Retrieved from http://www.independentsector.org/PDFs/GV01keyfind.pdf

National Center for Charitable Statistics. *NCCS national taxonomy of exempt entities - core codes (NTEE-CC).* Unpublished manuscript. Retrieved 2011, fromhttp://nccs.urban.org/classification/NTEE.cfm

Nonprofit Overhead Cost Study. *Getting what we pay for: Low overhead limits nonprofit effectiveness* (Research Brief No. 3) National Center for Charitable Statistics.

North Carolina Center for Nonprofits. *Why nonprofits matter: Quick facts.* Unpublished manuscript. Retrieved from, http://www.ncnonprofits.org/NAM/quickfacts.pdf

Pallotta, D. (2008). *Uncharitable: How restraints on nonprofits undermine their potential*. Lebanon, NH: Tufts University Press.

Princeton Survey Research Associates. (2001). *Final report: BBB wise giving alliance donor expectations survey*. Princeton, NJ: Princeton Survey Research Associates.

Salamon, L., Lessans Geller, S., & Wojclech Sokolowski, S. (2008). *Virginia's nonprofit sector: An economic force* No. 32) Retrieved fromhttp://www.ccss.jhu.edu/pdfs/NED_Bulletins/NED_Virginia_Final.pdf

VANNO. (2008). *The virginia nonprofit sector* Retrieved from http://www.vanno.org

Weber, N. (1994). Misusing charitable statistics in evaluating fundraising performance. *New Directions for Philanthropic Fundraising,* (3), 115-116-128.

APPENDIX

SURVEY

August 2010

Hello,

I am writing to ask for your assistance in improving the way nonprofits are evaluated.

My name is Samanthe Tiver and I am a student that The College of William and Mary in Williamsburg, Va. I am performing a quantitative research project to see if limitations on overhead costs are correlated with successful outcomes.

I am asking for your organization to send me **just one number**: [[INSERT: the square footage of homes rehabilitated or developed, the number of tickets sold, number of meals provided (prepared or unprepared)]] in Fiscal Year (FY) 2008. Please fill out the attached form and mail it to the return address or send the information in an email. The data is random and anonymous, so you're organizations' name will not be tied to the results. If desired, organizations will be recognized for their support and cooperation.

If you have any further questions about my research please feel free to contact me by email at setiver@email.wm.edu or by phone at (609) 234-3734.

Thank you in advance for your support of my research and the greater nonprofit community!

Sincerely,
Samanthe

Organization Name: _____

City/State: _____

For FY 2008, What square footage of homes rehabilitated or developed?
For FY 2008, How many tickets sold to your performances?
For FY 2008, How many meals (prepared or unprepared) did your organization provide?

_____